

**Global
System Manager
Version 8.1
Notes
Revision V8.1I
(including GSM SP-1 to SP-6)**

February 2001

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1. INTRODUCTION

This document describes the revisions that have been applied to Global System Manager V8.1 since its initial release. In addition to detailing the revisions of Global System Manager V8.1, upgrades to the executives, controllers and BACNAT components are also described.

Global System Manager consists of several software layers. Each layer has an independent software version, revision or variant.

1.1 Global System Manager versions and revisions

The highest level in the Global System Manager software hierarchy consists of the Global System Manager and Speedbase Presentation Manager "\$ programs" (e.g. \$F, \$BADGN etc.) and related files (e.g. \$MONITOR). The version of this software layer is referred to as the "Global System Manager version" (e.g. V7.0, V8.0, V8.1). This version number is displayed, together with the Contract Protection Message, at start-up time and also on the first line of the \$\$ report.

For Global System Manager V8.1 we have introduced the concept of the revision letter (revisions of Global System Manager V8.1 allow new features to be introduced gradually without the need for a major release). Details of Global System Manager V8.1 revisions are fully described in section 2.

For Global System Manager V8.1 revision V8.11 we have introduced the concept of Global System Manager Service Packs that allow new features to be easily introduced without the need to re-install GSM. Global System Manager Service Packs are fully described in Appendix I.

1.2 Global System Manager executive versions

The next level in the Global System Manager software hierarchy consists of the executives held in the +.J0 library. The version of the executive library is displayed by \$\$S. When a new version of Global System Manager is initially released, the "executive version" (i.e. the version of the members of the +.J0 library) will usually be the same as the version of the +.J0 library and the Global System Manager version (e.g. V8.1). During the lifetime of a particular version of Global System Manager, the versions of the individual executives, and the version of the executive library, may increase. In general, repackaged versions of the executives are not linked to revisions of Global System Manager.

For Global System Manager (Unix) configurations the executive library (i.e. +.C0) is empty. Thus, the version of executive library, which is meaningless for Global System Manager (Unix) configurations, is not displayed by \$\$S.

For Global System Manager (Windows) configurations the executive library (i.e. +.W0) is empty. Thus, the version of executive library, which is meaningless for Global System Manager (Windows) configurations, is not displayed by \$\$S.

Details of repackaged V8.1 executives are described in section 3.

1.3 Global System Manager controller variants

For most Global System Manager configurations, the controllers represent

the next level in the software hierarchy.

For Global System Manager (BOS) configurations, the controllers are held in the +.J5 library (for some configurations, controllers are also held in the +.J5PS library). The variant of the main controller library (i.e. +.J5) is displayed by \$S.

For Global System Manager (MS-DOS and Windows), the controllers are held in the +.JW and +.JWDOS libraries. The variant of the main controller library (i.e. +.JW) is displayed by \$S.

For Global System Manager (Novell NetWare), the controllers are held in the +.JW, +.JWDOS, +.JWNOV and +.JWNLM libraries. The variant of the main controller library (i.e. +.JW) is displayed by \$S.

For Global System Manager (Unix), the controller library (i.e. +.C2) is empty. Thus the variant of the controller library, which is meaningless for Global System Manager (Unix) configurations, is not displayed by \$S.

For Global System Manager (Windows), the controller library (i.e. +.W1) is empty. Thus the variant of the controller library, which is meaningless for Global System Manager (Windows) configurations, is not displayed by \$S.

In general, the controller variant is **independent** of the Global System Manager version, the Global System Manager V8.1 revision and the executive version. For example, the V4.2 controllers for Global System Manager (Novell NetWare), within the V4.2 +.JW library, will operate with Global System Manager V8.0 or V8.1. The current controller variants are listed in the Global Configuration Notes.

Details of repackaged controllers are described in section 4.

1.4 Global System Manager BACNAT variants

For some Global System Manager configurations, the BACNAT software (i.e. "native" software) represents the lowest level in the software hierarchy.

For Global System Manager (BOS) configurations, no BACNAT software is required. Consequently, the controllers (see section 1.3) represent the lowest level in the software hierarchy and the concept of a BACNAT variant does not apply.

For Global System Manager (MS-DOS and Windows), the BACNAT software consists of MS-DOS programs, batch files and text files. In general, the BACNAT software does not include an explicit variant number. The variant of the software is implied from the dates of the MS-DOS files. Details of repackaged BACNAT software are described in section 4.

For Global System Manager (Novell NetWare), the BACNAT software consists of MS-DOS programs, a NetWare Loadable Module (NLM), batch files and text files. In general, except for the NLM, the BACNAT software does not include an explicit variant number. The variant of the software is implied from the dates of the MS-DOS files. Details of repackaged BACNAT software are described in section 4.

For Global System Manager (Windows), the BACNAT software consists of Windows programs, batch files and text files. The BACNAT software always includes an explicit variant number. Details of repackaged

BACNAT software are described in section 5.

This document does NOT describe any details of the Global System Manager (Unix) BACNAT software. Details of the Global System Manager (Unix) BACNAT software are described in the various Global Configuration Notes for Global System Manager (Unix) configurations.

2. GLOBAL SYSTEM MANAGER REVISIONS

The revision of Global System Manager V8.1 is displayed by the \$S command. The revision of an individual component can be determined from the packaging date of the file, or library member, as follows:

1-Nov-1994	01/11/94	First external release of Global System Manager (revision V8.1b)
1-Dec-1994	01/12/94	Revision V8.1c
1-Jan-1995	01/01/95	Revision V8.1d
1-Feb-1995	01/02/95	Revision V8.1e
1-Mar-1996	01/03/96	Revision V8.1f
1-Jan-1997	01/01/97	Revision V8.1g
1-Feb-1997	01/02/97	Revision V8.1h
1-Nov-1998	01/11/98	Revision V8.1i
1-May-1999	01/05/99	Revision V8.1j
1-June-1999	01/06/99	Revision V8.1k (1 st release)
2-June-1999	02/06/99	Revision V8.1k (2 nd release)
1-June-2000	01/06/00	Revision V8.1l

In general, when a new revision of Global System Manager V8.1 is released the **lower-case revision letter** will be increased.

Global System Manager V8.1 can be upgraded from one revision to a later revision, without the need for a full installation. A new option in \$CUS (System Maintenance/Upgrade GSM revision), introduced with revision V8.1c, invokes a new overlay, \$CUSUPD. This option is fully described in section B.1 of Appendix B.

Very rarely, in special circumstances, you may be using a "Internal Release" version of Global System Manager. Internal Releases are normally only used within Global Business Systems for internal testing but may occasionally be released externally for informal evaluation, beta-tests or during the course of a problem investigation. Internal Release software is not supported and is never generated by our Production Department although it may be available on the BBS from time-to-time. Internal Release software is always referred to by an **upper-case version letter** (e.g. V8.1D is an Internal Release version of V8.1). Note that there is no relationship between and Internal Release upper-case letter (e.g. GSM V8.1D) and an external revision lower-case letter (e.g. GSM V8.1 revision V8.1d). Note also that it is NOT possible to upgrade to an Internal Release version of GSM using the \$CUSUPD utility, a full installation from BACRES is always necessary.

2.1 Global System Manager V8.1 revision V8.1c

Global System Manager V8.1, revision V8.1c includes several new features and significant enhancements to Global System Manager V8.1:

- A new \$CUS option allows an existing GSM V8.1 installation to be upgraded to revision V8.1c without the need for a full installation. In order to upgrade an existing V8.1b installation to revision V8.1c, the file \$CUSUPD must be extracted from the P.FULL2 library on the BEA volume and copied into the P.\$CMLB1 library on SYSRES. \$CUSUPD can then be run from the menu or the GSM READY: prompt as described in section B.1 of Appendix B.
- \$\$ has been improved to display the revision number of GSM (e.g. revision "c" for GSM V8.1c).
- The size of the Unit Assignment table has been increased from 29 entries to any multiple of 29 (e.g. 58, 87 etc). This enhancement affects \$A, <SYSREQ> I, \$MH and the ASSIG\$ subroutine. \$CUSA includes a new customisation to modify the number of extra assignment tables. Use the \$CUS/Configuration Maintenance/Miscellaneous Customisation option to set the Number of extra ASSIG\$ tables to 1 to increase the number of unit assignments from 29 to 58; 2 to increase from 29 to 78 or 3 to increase from 29 to 116. The maximum number of extra tables is 3. Note that applications must be relinked with the V8.1c ASSIG\$ in order to take advantage of the extended assignment table.
- Another variation of the Speedbase Access Method (SPAM) is available in preparation for the release of a new version of Speedbase that will allow Speedbase databases to be held in Btrieve file format.
- A new command (ABO) has been added to \$STATUS to allow a Global System Manager session to be ABOrted without checking for open files or other users. This new command does not attempt any of the checking performed by the TER command (or \$BYE) and must be used with extreme caution.
- Speedbase PM, \$BACUS and \$SDE have been upgraded to function with 8-bit character sets to allow Speedbase applications to be used with foreign languages.
- A new utility, \$BBS, has been provided to allow files that have been down-loaded from a BBS to be converted to GSM without the need for File Converters. This utility has been provided to allow future versions of GSM and the development software to be upgraded from files supplied on the Global Business Systems BBS. \$BBS is effectively a cut-down version of the MS-DOS file converter, and will only operate on Global System Manager (MS-DOS and Windows) or Global System Manager (Novell NetWare) configurations.

\$BBS allows MS-DOS directories to be listed, files to be exported from Global System Manager to MS-DOS and files to be imported to Global System Manager from MS-DOS.

The list option provides a very simple MS-DOS directory listing.

The export option allows any type of Global System Manager file, including a program file, to be converted to an MS-DOS text file in a format that is suitable for transmission by a Communications package

or a BBS. The MS-DOS file format created by \$BBS is identical to that created by the Comms option of the V8.1 Global File Converter FILECONV utility. The naming **convention** for the MS-DOS text file created by \$BBS is to use the Global System Manager filename as the 8-character MS-DOS filename with a 3-character suffix of "GSM". Any characters in the Global System Manager filename that are illegal in an MS-DOS filename (e.g. ".") should be replaced by an underscore character. For example, the Global System Manager file "\$BBS" would be converted to "\$BBS.GSM"; the Global System Manager file "P.\$CMLB0" would be converted to "P_\$CMLB0.GSM".

The import option allows an MS-DOS text file, created using the export option of \$BBS, to be converted back to the original Global System Manager file. Note that this option can only be used to convert an MS-DOS text file that has created by either \$BBS or the Comms option of the V8.1 Global File Converter FILECONV utility.

In addition to the above enhancements, the following bugs that occur during the installation of GSM V8.1 have been fixed in revision V8.1c:

- If the save/restore customisation option is selected, the installation of GSM V8.1 can occasionally fail when \$CUSP attempts to upgrade existing Printer Control Files. The pre-V8.1c version of \$CUSP is too large to run under Job Management during the installation process.
- The installation job aborts if the size of the spool unit is too small. This problem has been fixed by validating the size of the spool unit.
- The installation job aborts if an attempt is made to save/restore an empty \$\$AUTH file.
- The installation process fails to copy the following files from the BEA volume to SYSRES:
 - DBREORG
 - DBRBLD
 - P.DM
- To conserve space in the GSM installation job, the option to specify the Memory Bank size has been removed. This parameter can only be customised using \$CUS.
- The GSM installation patches the address of P.\$MON as a LAN address (e.g X01) on LAN configurations. This can lead to problems if the LAN address is changed or if the LAN card is removed or the hardware fails. The installation job has been changed to always PIP a local address (e.g 201).

The following bugs that occur during the use of the run-time GSM V8.1 components have been fixed in revision V8.1c:

- A PGM CHK 3 at F01E can occur when returning from a System Request or the debugger when running a Speedbase frame.
- A PGM CHK 11 at FOEE will occur when returning from a System Request if the current cursor X co-ordinate is exactly 128.
- The System Area flag SYFTWD should be set to -1 if an emulator TAP

(i.e. a number prefixed by an "E") has been loaded. The value of -1 is only set up correctly in P1. In all other partitions, SYFTWD is set to 0.

- The performance of the V8.1 GSM Loader was improved by removing an undocumented feature that allowed dispersed library support without the need for library stubs. However, several external products appear to rely on this feature and suffered from spurious overlay load failures when used with GSM V8.1. This feature has been restored in GSM revision 8.1c.
- \$A, in addition to handling more than 29 unit assignments, now displays the assignment table, sorted in order of logical unit, if the reply to the Unit? prompt is <CTRL C>. Furthermore, \$A now prevents the \$M logical unit from being reassigned.
- \$BYE has been recoded to prevent the problem that causes it to abort with various TRAP's if the Memory High Address has been reduced, typically to allow for a large System Stack created by Speedbase Presentation Manager.
- \$CUS has been enhanced in several areas:
 - The problem that causes a PGM CHK 10 at 1CA0 to occur in \$CUS Configuration Maintenance (i.e. \$CUSA) if <CR> is keyed to the "CA-block number" prompt in the "Console Control Blocks" option has been fixed.
 - The problem that causes the \$CUS "Apply Windows option password" to fail with a PGM CHK 3 at 205A if a character is missing from the password string has been fixed.
 - All the replies accepted by the \$CUS restore system customisation option are now converted to upper-case.
 - The \$CUS System Maintenance option that installs \$\$GROUP now correctly increases the size of the file.
 - The \$CUS System Maintenance option that installs \$\$MAIL now correctly increases the size of the file.
 - The \$CUS System Maintenance option that installs \$\$MAIL now correctly copies the \$\$MAIL file to SYSML rather than SYSRES.
 - The \$CUS Nucleus Update customisation option now correctly copies the A.am and =.NNNN files from BACRES to SYSRES.
 - The dialogue for option 11 (Century start date) in the \$CUS Configuration Customisation menu has been improved. Note also that the warning message displayed by GSM when a date in the 21st century is interpreted as a date at the start of the 20th century was also misleading and has been improved.
 - A serious problem that could result in the use of the \$CUS Apply Expiry Date Password (option 12 from the \$CUS System Maintenance menu) corrupting the \$STARH file and preventing GSM from reloading has been fixed.

- \$CUS now prevents any attempt to customise printer buffers larger than the maximum usable length of 254 bytes.
- The \$CUS Install Work Unit option always allocated a unit of 50Kb regardless of the value keyed. This problem has been fixed.
- The \$CUS Install Event Logging option always attempted to allocate a unit of size 0 regardless of the value keyed. This problem has been fixed.
- The problem that caused the \$CUS Install Mail Handling option to fail on an SSD volume has been fixed.
- \$DIR now offers a Next Page option when more than 90 sub-volumes are displayed in a domain listing.

The problem that caused \$DIR to fail with EXIT 803 AT 26CE if the "I" instruction is attempted on a volume larger than 999,999,999 bytes has been fixed.

The problem that caused \$DIR to fail with a STOP 302 if a unit address of "? " is specified has been fixed.

- \$DIRP occasionally forgot the name of the Supervisor program after the use of the <F2> option and returned to the READY: prompt on exit instead of returning to the menu. This problem has been fixed.

After keying "A" for alpha sort, keying <F1> appeared to be using the original order of files when determining the options to display. This problem has been fixed.

A problem which caused the \$DIRP Run Library menu option to display random characters at the end of the list of library members has been fixed.

- \$DLIB has been recoded to correct the problems that occur after members have been deleted from a Data Library.
- \$F now includes a multiply function, in addition to the increment, decrement and percentage functions, to the reply to the SIZE: prompt.
- \$L now allows the reply to the PRINT UNIT prompt to include a lower-case letter.

A reply of "n" to the WIDE REPORT? prompt is no longer treated as "Y".

- \$MAIL has been improved to include a "<CR> for Next" option in the base-line prompt for the inspect telephone message screen.

The dialogue for the \$MAIL Reorganise Mail file included some messages that disappeared from the screen very quickly. This dialogue has been improved to allow these warning messages to be read.

A reply of <CR> to the "List of Customised Operators" allows a supervisor to customise his/her own mailbox.

The reply to the base-line prompt displayed by the \$MAIL file organisation option is now correctly validated so that any reply other than "R" or <ESC> is treated as invalid.

On a non-LAN configuration, a spurious "time" message was displayed on the \$MAIL mailbox customisation screen.

The \$MAIL send mail dialogue has been improved to prevent the accidental loss of a mail message.

The problem that caused a spurious message ITEM ALREADY EXISTS to appear when redirecting telephone messages has been fixed.

Several cosmetic problems when reading Group mail have been fixed.

A new option, Mark, has been added to the base-line prompt on the Read Mail screen to allow the current message to be marked as "read" before displaying the next message.

- \$MH, the Menu Handler, now allows up to 8 databases to be specified when loading a Speedbase frame (the previous limit was 4). A new "line type code" of "E" has been allocated for this purpose and must be specified when using Menu Maintenance (i.e. MN) to load a Speedbase frame that requires more than 4 databases.

If the menu handler could not assign the required logical to physical assignments, it purged the assignment table. The menu handler has been improved to include an option to suppress the automatic assignment table purge. This option is selected by replying N to the new "Purge unit assignments if full" prompt in the Amend Menu Parameters option of MN.

The menu handler could not handle nested menus in SAA-style on colour screens. Spurious blocks of colour sometimes appeared. This problem has been fixed.

- \$REORG now checks for open files before attempting to reorganise Separated Subunit Domains.

\$REORG also forbids any attempt to truncate DMAM data files.

- \$SP has been improved. When the Delete option has been selected, only a reply of "Y" will confirm deletion.
- <SYSREQ> I now allows an assignment of the form xxn (where xx are both alphabetic and n is numeric e.g. AB1).
- <SYSREQ> N now displays telephone messages on non-LAN configurations.

The problem that caused <SYSREQ> N to occasionally fail to recognise valid groups has been fixed.

The following problems in V8.1 Global Configurator have been fixed in revision V8.1c:

- The problem that caused a PGM CHK 11 at 3CC4 to occur in CFUPDATE if an attempt is made to add another printer, if unit 599 has just been added, has been fixed.

- The maximum usable Printer Buffer length is 254. CFUPDATE now forbids any attempt to configure printer buffers larger than 254.
- The following prompts may appear in the NUCLEUS OPTIONS section of the configuration file:

DYNAMIC DA-BLOCK ALLOCATION (N):
DC/DF-BLOCKS IN HIGH MEMORY (N):

These flags are both reserved for future use. DO NOT ATTEMPT TO MODIFY THEM.

2.2 Global System Manager V8.1 revision V8.1d

Global System Manager V8.1 revision V8.1d includes several new features and significant enhancements to Global System Manager V8.1, revision V8.1c:

- All System Requests have been enhanced to operate correctly with the Global Windows Workstation (GUI) V2.0. However, some Global System Manager System Requests are inappropriate when used with the Global Windows Workstation and will not function with the GUI. The following System Requests, as described in Chapter 4 of the Global System Manager Manual, are not available on a "GUI screen":

```
<SYSREQ> A
<SYSREQ> B      (available with GSM V8.1 revision V8.1f)
<SYSREQ> E      (available with GSM V8.1 revision V8.1f)
<SYSREQ> O
<SYSREQ> Q
<SYSREQ> S
<SYSREQ> X
<SYSREQ> "
<SYSREQ> *
```

- The Global System Manager monitor has been enhanced to operate correctly with the Global Windows Workstation (GUI) V2.0. Various error messages and prompts (e.g. NOT READY, PLEASE ASSIGN etc) now appear correctly on a "GUI screen";
- The default century start date for fresh installations is now 1960 (the previous default was 1900);
- \$STATUS has been enhanced to display the total number of users who are signed-on to Global System Manager at the end of the full list report;
- The \$STATUS LOC command has been enhanced in several areas. The number of "in-use" lock table entries, and the total number of lock table entries, are displayed at the end of the report produced by the LOC command. In addition to specifying a computer/system id, it is now possible to display the locks that are outstanding on a particular file or unit. It is also possible to apply a "filter" to the LOC report so that only those locks asserted by a particular operator, or all the operators on a particular computer/system, will be included in the screen report. For example, to report only locked files on unit X09:

```
$47 TASK CONTROL:LOC
Computer-id, <CTRL B> for all, <CTRL A> for unit (X):<CTRL A>
Key unit-id:X09
Key file name, <CR> for all:<CR>
Key C to filter by computer, O to filter by Operator, <CR> for
all:<CR>
```

For example, to report only those locked files on unit X09, that are open by operators on computer A:

```
$47 TASK CONTROL:LOC
Computer-id, <CTRL B> for all, <CTRL A> for unit (X):<CTRL A>
Key unit-id:X09
Key file name, <CR> for all:<CR>
```

all: C Key C to filter by computer, 0 to filter by Operator, <CR> for
 Computer-id: A

For example, to report only those locked files on unit X09, that are open by operator ALAN:

```
$47 TASK CONTROL: LOC
Computer-id, <CTRL B> for all, <CTRL A> for unit (X): <CTRL A>
Key unit-id: X09
Key file name, <CR> for all: <CR>
all: 0 Key C to filter by computer, 0 to filter by Operator, <CR> for
Key operator-id: ALAN
```

Only those lock entries that match the optional filter criteria **exactly** are displayed. For example, shared locks (that can never match a specific operator-id) are never displayed when a filter is specified.

- The \$STATUS LOC instruction has also been enhanced to prompt for a secondary Speedbase database unit, to allow the Speedbase record information to be displayed, if a locked Speedbase database is split across several different units;
- The \$STATUS FIL command has been enhanced in several areas. The number of "in-use" file channel and file blocks, and the total number of file channels and file blocks, are displayed at the end of the report produced by the FIL command. In addition to specifying a computer/system id, it is now possible to display only a particular file, or only the files that are open on a particular unit. It is also possible to apply a "filter" to the FIL report so that only those files opened by a particular operator, or all the operators on a particular computer/system, will be included in the report. For example, to report only open files on unit X09:

```
$47 TASK CONTROL: FIL
Computer-id, <CTRL B> for all, <CTRL A> for unit (X): <CTRL A>
Key unit-id: X09
Key file name, <CR> for all: <CR>
all: <CR> Key C to filter by computer, 0 to filter by Operator, <CR> for
```

For example, to report only those open files on unit X09, that are open by operators on computer A:

```
$47 TASK CONTROL: FIL
Computer-id, <CTRL B> for all, <CTRL A> for unit (X): <CTRL A>
Key unit-id: X09
Key file name, <CR> for all: <CR>
all: C Key C to filter by computer, 0 to filter by Operator, <CR> for
Computer-id: A
```

For example, to report only those open files on unit X09, that are open by operator ALAN:

```
$47 TASK CONTROL: FIL
Computer-id, <CTRL B> for all, <CTRL A> for unit (X): <CTRL A>
Key unit-id: X09
```

Key file name, <CR> for all:<CR>
 Key C to filter by computer, 0 to filter by Operator, <CR> for
 all:0
 Computer-id:ALAN

Note that details of all the open files on the network, computer or unit are displayed. If a computer or operator filter is specified then only the "per-file" operator details of those operators that match the filter criteria are displayed. Contrast the functionality of the FIL command with that of the LOC command (see above) when an operator or computer filter is specified.

- \$STATUS has been enhanced to allow a user to restart their own screen. This "restart self" option is selected by the special reply of <CTRL A> to the USER: prompt;
- \$STATUS has been enhanced to allow a user to restart all the other operators on their computer/system. This "restart all" option, WHICH MUST BE USED WITH EXTREME CAUTION, is selected by the special reply of <CTRL B> to the USER: prompt;
- \$STATUS has been enhanced to display the word EXECUTING for the current operator in the report produced by the <CR> command. This enhancement fixes a problem that caused the current operator to be displayed as "INACTIVE FOR nnnn MINUTES" under some conditions;
- \$STATUS has been enhanced to allow a new command, ACT, to unquiesce (i.e. ACTivate) a quiesced system. The non-intuitive functionality of the QUI command has not been altered in any way;
- \$STATUS has been enhanced to allow it to be more tolerant of corrupt \$\$USER files. A User Number of "*" is displayed under some conditions that would have previously resulted in a PGM CHK 11 in \$STATUS;
- \$STATUS has been enhanced to display "progress messages" during the often time-consuming PRI command;
- \$STATUS has been enhanced to display a large period of inactivity in HOURS rather than "MANY MINUTES" when the time exceeds 9999 minutes;
- \$STATUS has been enhanced to allow a small (50 character) description to be associated with each screen on a multi-user or network configuration. A new command, CDE, which has a dialogue that is similar to the DES command, allows the list of Screen Descriptions to be maintained. The list of Screen Descriptions is held in the file \$\$SDES on the \$M unit. Another new command, LSF (i.e. LiSt Full), generates a full list which includes the Screen Descriptions in addition to the information normally displayed the <CR> instruction;
- A new "\$STATUS-like" utility, \$STAT, is available which displays the \$47 TASK CONTROL prompt directly without displaying the initial operator details;
- Another new "\$STATUS-like" utility, \$ST, is available which displays a concise list of those operators who have currently signed-on to Global System Manager;
- The C-ISAM format Speedbase database utility, \$BADB, has been improved

to function correctly when used under Job Management. It is also possible to suppress the print report produced by \$BADB. Furthermore, \$BADB now displays the number of the record block being processed thus providing a progress report;

- \$E and the \$STATUS RES instruction have been improved to work correctly when the Global Windows Workstation is used in "external host" mode;
- The "Restore Customisation" overlay, \$CUSRES, has been enhanced to restore the Screen Description file, \$\$SDES (see above), from the BACSAV volume;
- If the \$MAIL option is enabled, an explanatory message is displayed at start-up to indicate that the \$ML unit is being accessed to read the \$MAIL file;
- The Speedbase \$BADGN utility has been enhanced to ensure that the largest record set in the database is allocated as the last physical record set. It is hoped that this modification will alleviate some of the size restrictions that are being encountered with Global format Speedbase databases;
- <SYSREQ> X has been enhanced to append a <CR> to the last line to be transferred (if <F2>, rather than <F1>, is keyed after positioning the cursor at the "End" position). <SYSREQ> X has also been enhanced to suppress the appending of <CR> to all lines being transferred (if <F3>, rather than <F1>, is keyed after positioning the cursor at the "End" position);
- The prompt for the Speedbase Presentation Manager licence password now auto-terminates after 1 minute thus allowing an Automatic Bootstrap to continue. If the password prompt is auto-terminated in this way a log is written to the Event Log file (with a unique type code of "Y");
- \$S has been enhanced to display the Speedbase Presentation Manager licence expiry date, if this date is within a year of the current system date;
- The Speedbase LOCK handling has been modified slightly for V8.1d. A modification was included in Speedbase Presentation Manager V8.1 to avoid the database corruption that could occur if a 2nd rewrite via a "substituted" i/o channel altered any index segment or GVF field from its original value. A similar corruption could occur if a record was rewritten when previously deleted using a "substituted" i/o channel. The fix for V8.1 caused locks to be erroneously released on "substituted" i/o channels, thus preventing any possibility of subsequent i/o operations taking place on the same record. For the release of V8.1d, the problem has been fixed in a different way. Instead of releasing locks, Speedbase PM V8.1d updates an internal image of the index fields etc. so that database corruption is avoided without the need to release locks.

In addition to the above enhancements, the following bugs that occur during the use of the run-time GSM V8.1 components have been fixed in revision V8.1d:

- <SYSREQ> J and <SYSREQ> N now display an appropriate message if no mail unit (\$ML) is assigned;

- <SYSREQ> T now polls the target operator every 5 seconds. If a "talk" session is abandoned, a message is left on the target operator's status line;
- A bug in \$AUTH which allowed the \$\$AUTH file to be casually inspected in P1 has been fixed;
- \$F now forbids a negative allocation size thus preventing the allocation of an invalid sub-volume;
- The potentially misleading Computer Description is no longer displayed by \$U when reporting on a computer across a network;
- The bug that caused the \$DIR "I" command to display incorrect and misleading volume sizes has been fixed;
- The library header information displayed by \$DLIB now includes the unit-id and System Date (for compatibility with the report produced by \$LIB);
- The Printer Control File customisation overlay, \$CUSP, has been modified to correct some slightly misleading dialogue. The print report option has been changed to pick up the correct Format Letter which fixes several errors in the report. The bug that caused a spurious green screen map to be displayed briefly after the display of the last of the Utility Sequence screens has been fixed;
- Minor spelling mistakes in the \$DIR and <SYSREQ> C help screens have been corrected;
- A problem in <SYSREQ> C that caused inaccurate results from some divisions has been fixed;
- A problem in the Global System Manager (Unix) file converter, FILECONV, which caused it to fail to close channels, has been fixed;
- A minor problem in the dialogue for the \$V Amend Domain Error Map option has been fixed;
- A problem in the \$DIR Page function when switching between a Domain listing and a Subvolume listing has been fixed;
- A problem with the Menu Handler numeric selection option in a sub-menu with an SAA-style "cut-inside" title has been fixed;
- A problem in \$REORG that resulted in spurious IN-USE error messages has been fixed. In addition to ignoring open files on "SYSRES" (e.g. \$\$USER), \$REORG also ignores open files on a sub-volume if the name of the volume is "\$\$SWAP". This extra relaxation is to allow \$REORG to be used on those configurations where the swap files (i.e. \$\$SWAPx) are not held on the SYSRES volume (i.e. \$SW is not assigned to the same unit as \$DP);
- A problem in the handling of the sign-on retry count in \$AUTH has been fixed. The retry count was not being reset after a successful sign-on;

- A new Terminal Attribute Program, \$.712, has been released for use with the basic terminal emulator option available with the V2.0 Global Windows Workstation product;
- The problem in \$STATUS that resulted in a PGM CHK 12 when using the QUI instruction on a non-network configuration has been fixed;
- The list of \$STATUS commands displayed when ? is keyed to the \$47 TASK CONTROL: prompt is now in strict alphabetical order;
- The \$BBS utility has been improved to allow a full MS-DOS pathname to be specified

2.3 Global System Manager V8.1 revision V8.1e

Global System Manager V8.1 revision V8.1e is a minor revision that only affects developers who are using the Speedbase Access Method (SPAM). The following problems have been fixed:

- A problem in SPAM for Global format Speedbase databases that results in an ERROR N from the application code if databases are split across several SYSTEM's or computer node-id's;
- A problem in SPAM for Btrieve format Speedbase databases that results in a PGM CHK-3 when an OPEN operation is attempted;
- The problem in SPAM for Btrieve format Speedbase databases that results in unpredictable results when a READ PRIOR operation is attempted.

2.4 Global System Manager V8.1 revision V8.1f

Global System Manager V8.1 revision V8.1f includes several new features and significant enhancements to Global System Manager V8.1, revision V8.1e (and revision V8.1d, which was the previous run-time revision, prior to V8.1f).

The following changes to run-time Global System Manager have been implemented:

- \$V has been enhanced to provide a "Quick SSD Allocate" on Global System Manager (Novell NetWare) and Global System Manager (MS-DOS and Windows) configurations (although the benefits are expected to be most noticeable when \$V is used on a workstation to allocate sub-volumes on a Novell NetWare server). The "Quick SSD Allocate" option uses a new operation in the stand-alone SSD-FILE controller, +JWCA0C, or the SSD-FILE controller within GSM.NLM. The new operation allocates an MS-DOS file of the required size **without** initialising the entire file to binary-zeroes. This option can only succeed if certain nucleus and BACNAT components are being used (if the correct components are not installed, \$V will revert to the slower SSD allocation method). For Global System Manager (MS-DOS and Windows) configurations the SSD-FILE controller, +JWCA0C, must be V4.4, or later; the File Executive, +JOEA00, must be V8.1H, or later. If the sub-volume is being allocated across an Arcnet network the LAN Executive, +JOEF00, on both of the relevant computers, must be V8.1C, or later. For Global System Manager (Novell NetWare) configurations, the SPX LAN Executive, +JWEF01, must be V4.4, or later; the GSM.NLM must be V1.11, or later.

Although the "Quick SSD Allocate" is normally preferable to the slower method that involves writing binary zeroes to every virtual track on the sub-volume, there may be some circumstances where the slower method is required (e.g. if the sub-volume file is to be compressed using a file compression utility on the host o/s such as PKZIP). To revert to the "allocate with binary-zero write" algorithm terminate the reply to the \$V size prompt with <CTRL A> instead of the normal <CR>.

Note that the \$V "Quick SSD Allocate" option is not applicable to Global System Manager (BOS) configurations (where SSD volumes are not supported) or Global System Manager (Unix) configurations (where the only Unix technique available to create a subvolume of a specific size is to write a file of the required extent);

- The debug system has been enhanced to include an option that prevents the "user unfriendly" standard Diagnostics prompt from being displayed. This new feature is enabled if the \$DL unit assignment is present. If \$DL is defined, the debug system will allow the user to enter details of the circumstances that caused the EXIT CODE, STOP CODE or PGM CHK to occur and write a "Debug Event Record" (containing a full debug report) to a Debug Event Log File, D.DIAGN on the \$DL unit;
- \$INSPECT has been extensively enhanced. The restriction on the size of a text file being inspected has been removed. Print files and text files within Data Libraries can now be inspected. The default file name and unit are now displayed. If the file to be inspected is not found and no prefix is supplied, \$INSPECT will attempt to open file L.filename (if the unit is \$PR) or S.filename (if the unit is not \$PR).

The following new commands are supported by \$INSPECT:

LE (Line End)	Go to the end of the file
GA (Get All)	Get string, wraparound at file end, if necessary
FA (Find All)	Find string, wraparound at file end, if necessary
GS (Get Stay)	Get string, remain at the current position if not found
FS (Find Stay)	Find string, remain at the current position if not found
M (Memorise)	Memorize current position in marker 0 to 9
R (Restore)	Restore current position from marker 0 to 9

Furthermore, the "?" command now displays the filename, unit, current line number, total size of the file (if known) and the current file position expressed as a percentage of the total number of lines (or file size if the last line has not been inspected);

- The Menu Handler, \$MH, has been revised to fix various problems that have been observed with the Global Windows Workstation: The screen is cleared before a program is executed, to avoid the brief switch from GUI to text mode. The Menu Handler now detects the Global Windows Workstation is being used and displays the menu in the appropriate form thus removing the necessity for some of the menu customisations specified in the Global Windows Workstation Notes. It is now only necessary to customise the menu for a "Default <CR> line" in order to use the Global Windows Workstation. For example, the requirement for SAA-style display is no longer mandatory - allowing non-SAA-style menus on colour screens to be used on configurations that are also employing the Global Windows Workstation.

All free memory is now correctly released before the Menu Handler attempts to execute a Speedbase frame. A problem with the automatic log-off function that occurs with non-SAA style menus has been fixed. A problem that sometimes prevented menu entries on SAA-style menus from being executed when running Job Management has been fixed.

Menu Maintenance has been improved to print the details of "E" and "F" type menu entries correctly;

- \$MAIL has been enhanced in several areas. The problem that causes an "ITEM NOT FOUND" error after deleting the last mail item in the list has been fixed. It is now possible to edit a telephone message that has been sent to you. Note that this is only possible when inspecting the telephone message using \$MAIL (it is NOT possible to edit a telephone message using <SYSREQ> N). Note also that the suggestion to edit mail messages has not been implemented for this release. A mail message is automatically marked as "read" when a reply to it is sent to the originator thus alleviating the tedious requirement of replying to a mail message then marking it as read in two separate operations. The problem that causes an EXIT 13801 to occur when replying to a mail message on the 30th or 31st day of some months of the year has been fixed. The problem that causes a PGM CHK when the system time is more than 99:59:59 (i.e. when the date is displayed as **.**.**) has been fixed. Some problems with colours in some \$MAIL screens have been fixed. \$MAIL has been modified to explicitly set the operator-id of a reply message to fix a problem of un-examinable "ghost messages" when one operator sends a reply on the behalf of another operator;

- A new utility, \$XMAIL, is available for Global System Manager (Unix) configurations to constantly monitor for incoming Unix mail for those users currently running Global System Manager. If a Unix mail message is detected a message is displayed on the status-line for the relevant user. Note that this utility, which requires BACNAT variant V3.210, or later, only monitors incoming Unix mail - it cannot be used to send Unix mail;
- \$SP, \$SPS and \$SPOOL have been enhanced in several areas. The potentially dangerous Unclutter command can be aborted by replying <CTRL A> to the "operator" prompt. The spooler recognises a new command "J" which is effectively a combination of the "Release" and "Keep" commands. The main screen displayed by the spooler now contains the 30-character Printer Description. The problem in the spooler that causes an OVERFLOW when a file is "kept" on a spooler with \$RP set to an "intelligent" NET.PRI printer has been fixed. A problem in the View option which sometimes (i.e. if the text following the "PAGE" text is not a valid decimal number) results in a PGM CHK 10 when using the "P" command has been fixed.

\$SP now suppresses displays when running in background on a "GUI screen". This prevents the spooler from being permanently suspended when the Global Windows Workstation is being used;

- The \$STATUS "ABO" command has been modified to continue aborting Global System Manager even if it is unable to access the User File. This allows Global System Manager to be aborted cleanly on networked computers that have been disconnected from the master computer. The problem that sometimes causes spurious "*"s to appear in the report produced by the "FIL" command has been fixed. The problem that causes a PGM CHK 12 when using the TER command on non-network configurations has been fixed. The problem in the LOC command that causes a spurious PLEASE ASSIGN 000 prompt under some conditions (e.g. when the node-id of a workstation is 0xf0) has been fixed. \$STATUS has been enhanced for Global System Manager (Windows) to display details of all server computers.

The problem in \$ST that caused spurious characters to appear on the screen under some conditions has been fixed;

- \$DIR now pre-clears the Long Volume Description information on the screen to prevent stale information being displayed when a diskette is listed immediately after listing a sub-volume or domain. The default end-date prompt issued when the "D" option has been selected is never less than the start-date that was supplied (i.e. the default end-date is now the current system date or the actual start-date, whichever is the latest);
- The problem in \$REORG that gives the spurious UNABLE TO TRUNCATE DMAM FILE message when attempting a domain reorganisation that involves a change in size to subvolume 206 has been fixed;
- \$ZAP has been enhanced to allow zap files to be held in a Data Library if the file supplied to the "zap" prompt is a Data Library rather than a stand-alone Zap file;
- \$PRINT now recognises the text string ".PAGE" as a new page identifier (in addition to "PAGE");

- A new utility, \$MNDISP, is now available to display the customised fields within \$MONITOR (i.e. the parameters that are customised by the \$F PAM, PUF and PIP instructions);
- \$E has been enhanced to suppress the textual Contract protection Message on Global System Manager (Windows) configurations;
- \$S has been upgraded to recognise Global System Manager (Windows) configurations (i.e. \$\$SYSM = 4). \$S also displays the current Language Customisation;
- \$OPID has been improved to give an indication of the function being attempted (e.g. Add, Delete etc.) within the generic baseline prompt. For example, for the Delete function the prompt "Operator-id, <ESC> to exit" has been replaced by the prompt "Operator-id to delete, <ESC> to exit". A problem that causes unpredictable results after an "Operator not found" condition has been fixed;
- A problem in \$A that causes it to appear to lose the last 29 unit assignments under some conditions has been fixed;
- \$D has been enhanced to allow the System Date to be set to date significantly later than the Speedbase PM Expiry Date. This facility has been included to allow software to be demonstrated and tested with a System Date in the 21st century. The following 2 special dates bypass the normal validation: 25-Dec-1999 and 29-Feb-2000. This option is only allowed on Dealer (sic) Systems.
- \$BBS has been enhanced in several areas. The export mode offers a default MS-DOS filename, formed by using the 8 character Global filename with an extension of ".GSM". The following illegal characters are replaced by underscore if they appear in the Global filename: "*", "?", "/", "\", "+", ".". The import mode offers the name of the original Global file (obtained from the MS-DOS file) as the default Global file name. This default behaviour, which requires an initial read of the MS-DOS file to obtain the Global file name, can be suppressed by terminating the MS-DOS filename with <CTRL A> instead of the normal <CR>.

The \$BBS import mode now checks for a valid format MS-DOS file (except for certain control characters such as 0x0a and 0x0d, all the characters in the MS-DOS file should be in the range 0x20 to 0x7e, inclusive). The error reported by \$BBS when the Global output file becomes full that was erroneously displayed as "Invalid format file" has been corrected.

\$BBS will use SVC-80 (see section 3.4) to perform the text blocking/de-blocking. This will result in much faster conversions on those configurations where SVC-80 is available. Note that \$BBS allows the various conversion options to be selected, by keying "0" to the initial "Import/Export" prompt. \$BBS has been enhanced to operate on Global System Manager (Windows) configurations, in addition to Global System Manager (MS-DOS and Windows) and Global System Manager (Novell NetWare) configurations;

- A new utility, \$COMPRES, is available to allow Global files to be compressed and decompressed, offering a similar dialogue to \$SAVE and \$RESTORE. The H. prefix has been used as the default for compressed

Global files. Note that \$COMPRES requires the presence of SVC-80 (see section 3.4) to achieve acceptable compression times. Note also that the compression algorithm employed by \$COMPRES is not very sophisticated so compression factors are normally smaller than those obtained by other compression utilities (e.g. Unix compress, PKZIP);

- <SYSREQ> B has been enhanced to function correctly when used with the Global Windows Workstation (GUI);
- A problem in <SYSREQ> I that causes it to appear to lose the last 29 unit assignments under some conditions has been fixed;
- <SYSREQ> J now pre-clears the System Request screen to the current screen paper colour;
- <SYSREQ> N has been enhanced to offer a modified baseline prompt on Global System Manager (Unix) configurations:

Mailbox, Telephone, Group, External, System, Broadcast, <ESC> to exit:

The new "External" option allows a Unix mail script, defined by the MAILSCRIPT Unix environment variable, to be executed;

- <SYSREQ> > has been improved to prefix the status-line message with the current time and/or operator-id using the same algorithm that is employed for status-line messages displayed by the \$M and \$STATUS MES commands;
- The Global Windows Workstation (GUI) TAP (i.e. \$.711) has been modified to map <SHIFT> 3 to 0x23 (i.e. the "pound" character). Three alternative GUI TAP's are also available:
 - \$.713 based on \$.711 but with a 40 character (not 80 character) status line
 - \$.714 based on \$.711 but with "hash" instead of "pound"
 - \$.715 based on \$.713 but with "hash" instead of "pound"
- It is now possible to key the special response of "BYE" to the \$57 KEY NEW SYSRES UNIT: to abort a failed load of Global System Manager across a network. This feature is expected to be useful on Global System Manager (Novell NetWare) configurations if it is not possible for Global System Manager to access the file-server from a workstation;
- Various command programs have been modified to take advantage of the Foreign Language Translation feature of Global System Manager.

The following changes to Global System Manager customisation have been implemented:

- The V8.1f \$CUSUPD allows Global System Manager V8.1 revision V8.1e, or earlier, to be upgraded to V8.1f. IT IS NOT POSSIBLE TO UPGRADE TO REVISION GSM V8.1f WITH ANY VERSION OF \$CUSUPD OTHER THAN V8.1f. ANY ATTEMPT TO USE A VERSION OF \$CUSUPD EARLIER THAN V8.1f, WHEN ATTEMPTING TO UPGRADE TO V8.1f WILL RESULT IN THE FOLLOWING ERROR MESSAGE:

INCOMPATIBLE VERSION OF GLOBAL SYSTEM MANAGER

Note that the unavoidable requirement for V8.1f \$CUSUPD is a result of some complex internal modifications to Global System Manager that have been implemented for V8.1f. To perform an update customisation to V8.1f use \$LIB to copy the \$CUSUPD file from the P.FULL2 library on the BEA volume into the P.\$CMLB1 library on SYSRES, deleting the existing \$CUSUPD member (as described in section B.1 of Appendix B);

- The \$CUS Configuration Maintenance overlay, \$CUSA, now checks the RSA and CSA values specified in the RAM Disk/Cache customisation for reasonableness. A warning is displayed if an attempt is made to set RSA=1 and CSA=0;
- The \$CUSA overlay also includes a new option in the Special Customisations section that allows an Operator-id and Terminal-Type to be customised for every screen configured. This option is only expected to be useful on Global System Manager (BOS) configurations where it is not possible to customise these features using environment variables or command line arguments. **Important note:** Any Special Customisations applied using \$CUSA will be removed if Global Configurator (i.e. CFUPDATE) is used to modify the configuration file;
- The \$CUS Printer Control File (PCF) customisation overlay, \$CUSP, has been improved to fix the various problems that occur when the "C" option is used to copy details from another format letter. These problems result in a number of symptoms including EXIT 12001 and PCF corruption. The problem that results in a PGM CHK 3 when attempting to remove the Default Format Letter has also been fixed;
- A problem in the Printer Characteristics option of \$CUS that prevents the "Does the printer automatically provide LF after CR" option from being customised for some classes of printers (e.g. \$AUXPRI) has been fixed;
- The Create SYSRES diskette option from the \$CUS System Maintenance menu now works correctly on Global System Manager (Unix) configurations. This option also checks the volume format of the \$WK volume is SYWORK before attempting to scratch the \$WK sub-volume. The verification of the SYSRES diskette, before files are copied to it, is no longer performed;
- \$CUSUPD has been modified to fix a problem that occurs when upgrading a Global System Manager (Unix) PM tape configuration. The problem results in a STOP 9510 during the upgrade customisation;
- The \$CUS Configuration Customisation includes a new option to allow a "Language code" to be customised. THIS OPTION IS RESERVED FOR FUTURE USE;
- If \$AUTH suffers an exception when attempting to rename the \$AUWK work-file back to \$AUTH a message is displayed to warn that any updates have been lost.

The following changes to Global System Manager installation have been implemented:

- The installation job has been enhanced to allow all the TAP's in P.\$UTAP on BACRES to be copied to P.\$TAP on SYSRES (in addition to the configuration-specific TAP's from the P.nnnnT library). To make the

"install all TAP's" option useable, a number of obsolete TAP's have been moved from the P.\$UTAP library on BACRES to a secondary TAP library, P.\$UTAP2 on the BEA volume. Furthermore, the "base GUI" TAP (i.e. \$.711) is always installed onto SYSRES. The title of the P.\$TAP library on SYSRES is now accurate;

- The IPL address PIP'ed into \$MONITOR at installation time is always a local address (i.e. rather than a network address) in order to prevent the fatal INITIATION WARNINGS that can occur when network computers are re-configured;
- The non-standard installation option has been rationalised to remove the 2 obsolete non-standard options (i.e. it no longer possible to "Transfer GSM to disk without installing" or to "Install the GSM bootstrap only");
- The sizes of all volumes specified during installation must be entered in bytes, Kb, Mb or Gb. Prior to V8.1f, the SIZE OF SYSRES, for example, was specified as an integer which was multiplied by 1024 by the installation job to obtain a size in Kb.

THIS CHANGE HAS RESULTED IN AN UNAVOIDABLE INCOMPATIBILITY BETWEEN THE PRE-V8.1f INSTALLATION DIALOGUE:

[A.20] Key size of SYSRES in K (minimum of nnnnK):

AND THE V8.1f, AND LATER, INSTALLATION DIALOGUE:

[A.20] Specify size of SYSRES (minimum of nnnnK):

For example, a reply of 8000 to the V8.1d "Size of SYSRES" prompt is valid and will result in a SYSRES of 8000*1024 bytes (i.e. approximately 8Mb) being created. A reply of 8000 to the V8.1f "Size of SYSRES" prompt is invalid (because the installation will fail when attempting to install onto a SYSRES of only 8000 bytes);

- Some of the messages and prompts displayed by the installation jobs have been improved and modernised. All messages and prompts are now displayed in a standard format, where possible;
- The restore current customisation option now correctly restores all menu files with a name of \$MENUxx in addition to menu files with a name of \$MENUxxx;
- The installation jobs have been improved for Global System Manager (Windows) configurations;
- The initial, default menu installed with Global System Manager now includes entries for \$E and \$BYE in the GSM Utilities sub-menu;

The following changes to Speedbase Presentation Manager have been implemented:

- The problem in Speedbase PM that results in a spurious STOP 25586 has been fixed;
- The size of \$BADGN utility has been reduced. The V8.1f \$BADGN is considerably smaller than the V8.1d \$BADGN. The problem that causes \$BADGN not to report the record-id when a numeric overflow is detected

has been fixed. \$BADGN has been modified to suppress the message and prompt that are displayed if a rebuild error occurs when running under Job Management. \$BADGN can be used with Btrieve format Speedbase databases. **Note to Speedbase Btrieve beta-testers:** All problems with the \$BADGN utility that were reported during the beta-test have been fixed. Note also that the \$BADG utility (i.e. the cut-down \$BADGN) will be withdrawn in the next revision of Global System Manager V8.1;

- Both \$BAST and \$BASTS can be used with Btrieve format Speedbase databases. Furthermore, \$BASTS can now cope with databases that contain more than 999,999 records;
- A new utility, \$BADN, which is used to create and maintain Btrieve format Speedbase databases is now available (see Appendix C for a complete description of this utility). **Note to Speedbase Btrieve beta-testers:** All problems with the \$BADN utility that were reported during the beta-test have been fixed;
- \$BA now displays the EXIT CODE returned from the BA\$OPN routine when an attempt to open a Speedbase database fails;
- The problem in \$BADB that results in a PGM CHK 11 when upgrading a C-ISAM format Speedbase database under some conditions (i.e. if the new database has an extra record type) has been fixed. Furthermore, \$BADB now functions correctly when running under Job Management. For example, the problem that caused Job Management to terminate when the "Database dump already exists on this directory - Delete?" prompt appears has been fixed;
- The Speedbase Help Handler has been modified to (optionally) pass control to the generic Global System Manager Help Handler. This option is enabled if the Help Text starts with the special string "\HB-XX";
- A problem that occurs with "Locks on Substituted Channels" has been fixed. The Speedbase LOCK handling was modified for V8.1d in an attempt to fix a long-standing problem (see page 16). Until the release of Speedbase Presentation Manager V8.1, a program could lock the same record using two different channels, and rewrite both versions. Since each channel has its own "before image", this caused database corruption when a second rewrite took place (because the assumed "before" version had been superseded). This fix introduced for V8.1d avoids this problem by updating the before image of all duplicated channels to match the current record image. Unfortunately, the Read Next processing uses the same "before image" to position itself within the index. This means that where a Rewrite modifies the Index Key value of a duplicated channel, a Read Next from that channel will fetch the record following the rewritten key, rather than the key as it was before the rewrite.

For GSM V8.1f, Speedbase Presentation Manager includes a fix that does not involve updating all the images of all duplicated channels.

The effect of the V8.1f fix, where the same record has been read into 2 or more duplicated channels, is as follows:

- A Delete operation on any channel causes the locks to be released for that record in all other channels (as would be expected). Any attempt to rewrite or delete the record again will result in the RECORD NOT LOCKED exception condition;

- A Rewrite operation on any channel causes the locks to be released for that record in all other channels IF the rewrite operation causes an Index or GVF value to be modified.

Note that prior to V8.1, these operations were permitted but generally resulted in database corruption.

The general rule now is that a Delete or Rewrite operation that modifies any Index or GVF disallows further rewrites of the same (previously read) record using other channels. Prior to V8.1 this sequence of operations would generally cause database corruption (usually with the "Index Not Found" STOP CODE). The only exception is the combination of a rewrite that modifies an Index or GVF, followed by a second rewrite that does not. Prior to V8.1f, this sequence would have completed successfully, now it will suffer a "Record Not Locked" exception;

To summarise the Speedbase Duplicate Channel handling issue throughout various versions of Speedbase PM:

There was a bug in pre-V8.1 Speedbase PM that, when the same record was locked twice on two separate I/O channels, Speedbase allowed a record Deletion, for example, on one channel and then Rewrite it on the second channel. This attempted Rewrite on a deleted record caused database corruption. A Rewrite on one channel followed by a Rewrite on the other similarly caused corruption. The corruption arose because the pre-image of the second channel was non-current at the time the second I/O took place.

In the 1st release of GSM V8.1 (i.e. prior to revision V8.1d) there was an attempt to fix this problem by dropping the secondary channel lock. This caused some unforeseen problems, so in V8.1d there was another fix that had the unfortunate side-effect of changing the current position of the secondary I/O channel. This occurred because Speedbase updated the "pre-image" of the secondary channel so that it matched the current image resulting from a Rewrite operation on a duplicated channel. However, the same information is also used during sequential processing, so that doing a Rewrite on one channel, caused any duplicated channel containing the record to have it's index position changed to the position of the re-written record.

This secondary problem has been fixed in the V8.1f release. To make it all absolutely clear, the Duplicate channel processing has worked as follows since V8.1f:

- If you do a delete, any duplicate channel CONTAINING THE SAME RECORD is unlocked.
- If you do a rewrite, any duplicate channel CONTAINING THE SAME RECORD is unlocked, IF the effect of the rewrite was to change an index key, master access key, or a GVF value.

To summarise: The only feature that can be affected by any of the extra logic is the lock status of the I/O channel. If a record is changed in any material way on one I/O channel, then if exactly the same record is locked on another channel, it is unlocked. It is unlocked because the record in the other channel is no longer current, and hence cannot be rewritten to the database.

Other than this potential change to the lock status, the duplicate channel handling works in the same way as it has done since duplicate channel handling was first introduced in Speedbase V3.0 (except for the bug introduced in V8.1d and fixed in V8.1f).

- Speedbase Presentation Manager has been modified to support the Global System Manager Foreign Language Translation mechanism.

The following changes to the Global Cobol Development System have been implemented:

- A new Direct File Access Method is available for Global System Manager (Windows) to allow direct access to host o/s files on Windows NT configurations;
- An "open" version of the Direct File Access Method is now available, as a memory page, which allows a single interface to host o/s files on Global System Manager (Unix), Global System Manager (MS-DOS, Windows and Novell NetWare) and Global System Manager (Windows) configurations;
- A serious problem in the READ LAST function of all the Direct File Access Methods has been fixed. This problem could result in the READ LAST operation returning corrupt data under some circumstances;
- The Direct File Access Method for Global System Manager (Unix) has been enhanced to allow the Unix file permissions to be supplied during the OPEN operation;
- Memory page \$PA027, for DMAM Btrieve, has been repackaged to fix a problem that resulted in unexpected data and the wrong result code (i.e. \$\$RES = 5 rather than 2) when the END OF FILE condition is detected when reading via a partial key;
- The \$WTRAM module is distributed on the MKA volume to allow \$COBOL to be used on Global System Manager (Windows) configurations;
- DMSDUMP has been enhanced to continue the production of a report file if the host o/s database (i.e. Btrieve or C-ISAM) cannot be found (from the information contained within the Global schema file);
- The Btrieve format DMAM Access Method has been enhanced to support Btrieve Locking and Btrieve Owner Names. The DMAM Access Method has also been modified to fix a serious problem that occurs if a DMAM database contains more than 127 indexes;

THE DMAM-BTRIEVE OPTION IS NOT FOR GENERAL-USE AND SHOULD ONLY BE USED BY SPECIALISED, BESPOKE APPLICATIONS.

- A number of new System Variables are now available:

```

$$REV      Global System Manager V8.1 revision letter (e.g. "f")
$$GUI      Global Windows Workstation (GUI) flag
$$TRAN     Translation enabled flag
$$LANG     Global System Manager language code

```

- A number of new subroutines are available:

CEVER\$ Return Console Executive version
 GETM\$ Return translated text string
 TECON\$ Turn translation on
 TECOF\$ Turn translation off

THESE SUB-ROUTINES ARE RESERVED FOR FUTURE USE - DO NOT ATTEMPT TO USE THEM;

- The OPMN\$ sub-routine has been improved to only require a 60 byte work-area (the previous version required a 2000 byte work area);
- New versions of the BDAM (Basic Direct), TFAM (Text File) and RSAM (Relative Sequential) Access Methods are now available that allow read-only access to files in data libraries, created and maintained by the \$DLIB utility;
- A new "open" version of the Speedbase Access Method (SPAM) is now available (as a memory page) in addition to the 3 "format specific" versions of SPAM. This "open SPAM" allows read-only access to Global format Speedbase databases (on any configuration), C-ISAM format Speedbase databases (on Global System Manager (Unix) configurations) and Btrieve format Speedbase databases (on Global System Manager (Novell NetWare) configurations);
- All versions of SPAM now produce a STOP 9918 if an error occurs when reading the Speedbase database IDB. The problem that could produce an ILL LOAD in SPAM if an error occurs when reading the Data Dictionary has been fixed;
- \$ED has been improved to create a unique work-file name, using the file label number, instead of the building the name from the operator-id and node-id;
- Several problems in DBDUMP have been addressed. DBDUMP will now operate correctly on databases with more than 127 indexes. The problem that caused a PGM CHK 11 when attempting to use the <DOWN-ARROW> key to access the 2nd screen of a record in "Amend Mode" has been fixed. The problem that resulted in DBDUMP producing unexpected results after displaying the 2nd page of a dump has also been fixed. DBDUMP now produces a different error message for the FILE NOT FOUND and INDEX NOT FOUND error conditions;
- The V8.1 \$FORM "I" attribute (i.e. Invisible Field) has been modified to produce the same result as V6.2 "Invisible Fields" (i.e. the reply being accepting into the Invisible Field is NOT echoed as it is being keyed). A new attribute "C", has been defined which emulates the original V8.1 "Invisible Field" handling (i.e. the reply IS echoed while it is being keyed but is made invisible when the terminator is keyed). **Important note:** This change has resulted in a considerable increase in the size of the Screen Formatting sub-routines;
- Several new development utilities (e.g. \$TRANS, \$TRMAIN) have been released to allow Speedbase applications to be translated into foreign languages. THESE UTILITIES ARE RESERVED FOR FUTURE USE - DO NOT ATTEMPT TO USE THEM.

The following changes to the Global Speedbase Development System have

been implemented:

- The Speedbase Development System installation job now scans all units in the range 100-299 for a suitable SYSSBD volume. The default size of SYSSBD has been increased;
- The \$SDL compiler now recognises the following System Variables: \$\$HBK, \$\$SYSM, \$\$CRES, \$\$HFIL, \$\$HUN, \$\$LANG, \$\$TRAN, \$\$HCLR, \$\$HPTR, \$\$REV. The problem in \$SDL that caused it to fail to recognise any master/servant relationships in the 8th database has been fixed;
- A new subroutine, B\$LODL, is available. This subroutine is a variation on B\$LOD that does not clear the screen;
- A new subroutine, B\$CLD, is available. This subroutine is a variation on B\$CDB that prevents File Locks from being cleared on the database that is about to be closed. This subroutine is required when several levels of Speedbase frames (using SBOVL\$) are being accessed. All levels of frames are locked on the same User Number so that frame closes effected by the B\$CDB routine will have the effect of clearing all locks established by the same user at a lower frame level;
- The B\$RBL subroutine has been revised to effectively return immediately without taking any action when used on a Btrieve format Speedbase database;
- The B\$OPN subroutine has been revised to return an error if an attempt is made to open a C-ISAM format Speedbase database on a non Global System Manager (Unix) configuration. A minor problem with C-ISAM format databases, that caused an EXIT 25524 instead of an EXIT 25527, has been fixed.

The following changes to Global File Converters have been implemented:

- The SVC-61 File Converter for Global System Manager (MS-DOS and Windows) and Global System Manager (Novell NetWare), FILECONV (aka FCONV-JW) has been modified to fix the problem that causes a PGM CHK 11 if the size of an MS-DOS being listed is 100Mb, or larger. A problem in the multiple file export option, that causes a PGM CHK 3 (possibly followed by irrecoverable ERROR K's) has also been fixed. Another problem that causes a PGM CHK 3 when exporting Global text files, if the last block of the file contains a single byte has also been fixed;
- An SVC-61 File Converter for Global System Manager (Windows) configurations, FILECONV (aka FCONV-W1) is now available. The Global File Converters installation job has been enhanced to install FCONV-W1, renaming to FILECONV, on Global System Manager (Windows) configurations.

The following changes to Global Configurator have been implemented:

- The A.VTYPE action file has been modified to change the Z151Z volume format type to allow multiple copies of Z151Z DLV's (e.g. unit 110, 111 etc.) to be included in a configuration file. DO NOT ATTEMPT TO INCLUDE MORE THAN 1 Z151Z DLV IN A CONFIGURATION FILE UNLESS THE VERSION OF A.VTYPE YOU ARE USING IS DATED 11/05/96, OR LATER;

- The internal AFU utility has been upgraded to allow the Global System Manager (Windows) Action Files, A.W0 and A.W1, to be created (and used for producing the Global System Manager (Windows) configuration files). The A.W0 Action File is now distributed with Global Configurator. The A.W1 Action File will be distributed on the Global System Manager (Windows) BACRES volume.

2.5 Global System Manager V8.1 revision V8.1g

Global System Manager V8.1 revision V8.1g includes several new features and significant enhancements to Global System Manager V8.1, revision V8.1f.

The following changes to run-time Global System Manager have been implemented:

- A problem in the Debug diagnostics overlay, \$OV\$, that causes corruption in the text of the "LAST FILE ACCESS OPEN NEW" message (i.e. the first 3 characters of the word "OPEN" are corrupted) has been fixed;
- \$V has been enhanced to display the message "Allocation in progress, please wait..." when the Quick SSD Allocate option is used. Furthermore, \$V has been modified to support Global System Manager (Windows) configurations;
- The logic in Global System Manager direct printing that processes Printer Control Files now works correctly for "floating" \$AUXPRI printers;
- The \$P "change default format letter" function now works correctly for "floating" \$AUXPRI printers. In addition, \$P now displays the Printer Description of the selected printer and recognises the special naming convention for Printer Control Files on Global System Manager (Novell NetWare) configurations;
- The \$SP Initialise Printer (I) command now works correctly for "floating" \$AUXPRI printers. The \$SP and \$SPS help text now includes details of the "J" command introduced with V8.1f and described in section 2.4.

Furthermore, \$SP has been enhanced to avoid the call to the Allow Log Off routine, LOGOF\$, if the node-id of the spool unit (\$PR) is different from the node-id of the computer that is running the spooler. This will force the operator to exit the spooler before running \$BYE on the same computer thus preventing the \$\$\$SP file from remaining open. This problem is most likely to occur on Global System Manager (Novell NetWare) configurations, where the spooler is run from a workstation with a spool unit allocated on the file-server; or on Global System Manager (Unix) configurations, where the spooler is run from a SYSTEM that is not a file-server;

- The changes to \$ZAP for V8.1f (described in section 2.4) introduced a problem that removed the default Z. file prefix handling in \$ZAP. This problem has been fixed in V8.1g. However, if the required zap is within a Data Library both the "E." prefix (for the library file) and the "Z." prefix (for the library member) must be supplied;
- During our extensive testing of 21st century date handling (i.e. to ensure there are no problems with Global System Manager after 31-Dec-1999) two **obscure** problems that can **potentially** occur during Global System Manager initiation have been discovered. The first problem, which results in a spurious licence infringement message, will only occur if the Century Boundary Year is set to 1900. This problem should never occur in practice because all Global System Manager V8.1 systems are pre-configured with a Century Boundary Year of 1950 or

1960. The second problem will only occur if an attempt is made to change the default sign-on date from a day in the 21st century to a day in the 20th century. The start-up code will not accept a short date (e.g. 31/12/99) but will insist that a long date (e.g. 31/12/1999) is specified. Both of these problems have been fixed for V8.1g.

It must be stressed that these problems (both of which are extremely unlikely to occur in practice) only affect Global System Manager start-up: No run-time problems with date handling in the 21st century were encountered during our exhaustive testing.

See also section 4.5.1 that describes some obscure problems with the Global System Manager (BOS) Date/time handler (i.e. %.J5D);

- The domain listings produced by \$F and the \$V "List Directory" option deliberately ignore the details of any sub-volumes that contain a directory sector(s) that is unreadable. The \$V List Directory option (menu entry 10) now optionally displays brief details of any unreadable sub-volumes. This option is enabled by terminating the reply to the domain address (e.g. 200) with <CTRL A> instead of the normal <CR>;
- \$\$ has been enhanced to recognise two new values of \$\$SYSM:
 - 4 Global System Manager (Windows) - normal operation
 - 5 Global System Manager (Windows) - server installation mode
- \$\$ has been enhanced to display the Global System Manager (Windows) BACNAT variant (n.n);
- \$CUS, and its various overlays (e.g. \$CUSA, \$CUSP etc.), have been modified to support Global System Manager (Windows) configurations. A problem in \$CUS that results in a PGM CHK 16 (NO BASE) AT C368 when attempting to print the details of a Format Letter has been fixed. \$CUS System Maintenance now recognises "e" and "l" (as well as "E" and "L") as valid replies to the TERMINAL TYPE prompt when Installing Extra TAPs.

The misleading "Apply price upgrade key" option in the System Maintenance menu (i.e. the option that allows a price band to be increased from information on a BACRES diskette without the need to re-install) has been changed to "Upgrade price level";

- Global System Manager printer handling (e.g. \$P, \$SP etc.) has been modified to support Global System Manager (Windows) configurations;
- All the standard Global Windows Workstation (GUI) TAP's (i.e. \$.711, \$.713, \$.714 and \$.715) have been enhanced to include support for 132-wide mode;
- A problem in \$CUSUPD that can result in a STOP 14710 when upgrading \$MONITOR (i.e. during the \$F PAM section of the dialogue) has been fixed. An omission in the V8.1f \$\$UPDATE file (which controls the \$CUSUPD update process) has been corrected. The problem in V8.1f prevented the P.\$BAPGS library from being updated correctly. \$CUSUPD always copies MN and P.MN from the distribution media to SYSRES (earlier versions only copied the Menu Maintenance modules to the SYSRES on the master computer).

- A number of problems in the \$STATUS LOC instruction when the <CTRL B> option is used to report the locks on all the file servers on a network have been fixed. The first problem causes the unit numbers of locked files to be reported as local units (e.g. 220) instead of network units on the computer/server (e.g. A20). This can cause further problems if a Speedbase database is locked. The second problem causes the number of "LK Blocks" reported by the LOC instruction to be inaccurate: The number actually refers to the number of LK blocks configured on the local computer rather than the number on the file-server computer. The third problem results in the test for Access Method Locks being performed on the local computer instead of the file-server computer. None of these problems occur if the \$STATUS LOC instruction is used to report on a single file-server or SYSTEM;
- The Global System Manager run-time code has been enhanced to support the "Open TFAM" Access Method, described below;

The following changes to Global System Manager installation have been implemented:

- The Menu Maintenance option (i.e. MN and library P.MN) is ALWAYS installed onto SYSRES. Previous revisions of GSM V8.1 only installed Menu Maintenance on the Master SYSRES.

Important Note: It is our intention to rename the Menu Maintenance utility, MN, to \$MN in a future revision of GSM V8.1;

- The option to include an entry for Menu Maintenance in the default System Menu has been removed. Entries for Menu Maintenance and the Spooler are ALWAYS included in the default System Menu;
- The functionality of the \$BAM menu (MENU\$) front-end has been included, as a sub-menu, in the default System Menu supplied with Global System Manager PM configurations. This menu is correctly customised to operate with the Global Windows Workstation (GUI). In addition, an entry for \$BAST is included the Speedbase Presentation Manager sub-menu. Furthermore, the Speedbase Presentation Manager sub-menu now contains the appropriate entry for \$BADB (C-ISAM Database Utility) or \$BADN (Btrieve Database Utility) depending on the host operating system.

Important Note: The (obsolete) \$BAM menu front-end is still distributed and installed with Global System Manager PM. However, it is our intention to withdraw \$BAM in a future revision of GSM V8.1;

- Terminal type \$.711 (instead of the basic, TTY-mode \$.0) is used when installing Global System Manager on Windows NT. The appropriate Global Windows option (GUI) password is effectively applied automatically on Global System Manager (Windows) configurations;
- The various installation jobs (i.e. INSGSM, CUSGSM and EPINS) have been enhanced to operate on Global System Manager (Windows) configurations. Note that the "non-standard installation" option, and other irrelevant options, are NOT available on Global System Manager (Windows) configurations. The \$B and \$BA unit assignments are always assigned to a local diskette (e.g. unit 140) instead of a diskette drive on the "master" Server (e.g. unit a40).

The following changes to Speedbase Presentation Manager have been implemented:

- Speedbase Presentation Manager has been enhanced considerably to provide closer links with the "Global GUI Interface" which is incorporated into both the Global Windows Workstation (GUI) product and the Global System Manager (Windows) nucleus software. The changes mainly involve supplying the GUI with detailed information regarding "Display Only" Windows, Scrolled Areas, SBOVL\$ calls and a special Escape Sequence that uniquely identifies each window.

THE V8.1g SPEEDBASE PRESENTATION MANAGER IS INCOMPATIBLE WITH ANY VERSION OF THE GLOBAL WINDOWS WORKSTATION EARLIER THAN VERSION V2.1A. SIMILARLY, THE V8.1g SPEEDBASE PRESENTATION MANAGER IS INCOMPATIBLE WITH ANY VERSION OF THE GLOBAL SYSTEM MANAGER (WINDOWS NT) BACNAT SOFTWARE EARLIER THAN VERSION V2.0/V2.1A;

- A Speedbase TAP for terminal type 712 (i.e. T>712) is now available;
- A problem in \$BARBL that results in a PGM CHK 11 if the error report consists of more 99 pages has been fixed;
- \$BADN has been enhanced to display the current block number (where a block is 256 records) during the conversion of a Global format Speedbase database to Btrieve format.

The following changes to the Global Cobol Development System have been implemented:

- A problem with \$EDIT that causes a PGM CHK-11 AT 14E2 to occur if the spare space on a subvolume is more than 99,999,999 bytes has been fixed;
- A problem in \$FORM that results in corruption when a large map contains Variants has been fixed;
- The DMSDUMP utility has been improved to make it more resilient when dumping a corrupt DMAM database;
- A problem with the Speedbase Access Method (SPAM) when used to access Btrieve format Speedbase databases has been fixed. This problem, which only affects an evaluation version of Global Reporter, is unlikely to be encountered by any external developers;
- A new version of the TFAM Access Method (i.e. "Open TFAM") that allows direct access to Unix, MS-DOS or Windows NT text files (via a Schema File) is available. This Access Method is selected by using the following new ORGANISATION statement:

```
OR$830 TYPE 3 EXTENSION 544
```

and linking with module AT\$Z from library C.\$PAGES. **Important Note:** This Access Method will only function correctly on GSM V8.1g, or later;

- A new subroutine, TFSCM\$, is available to allow the TFAM Schema File for a Unix, MS-DOS or Windows NT text-file to be created, read or

updated. **Important Note:** This subroutine will only function correctly on GSM V8.1g, or later;

- Three new subroutines, NOPEN\$, NLIST\$ and NCLOS\$ are available to provide the equivalent of OPEN\$, LIST\$ and CLOSE\$ for Unix, MS-DOS or Windows NT files (either directly or via a Schema File). **Important Note:** This subroutine will only function correctly on GSM V8.1g, or later;
- A new subroutine, SHCMD\$, is available to execute a Unix or Windows NT command (either directly or via a Schema File). **Important Note:** This subroutine will only function correctly on GSM V8.1g, or later;
- A new subroutine, SCHEM\$, is available to allow the Schema File for a Unix, MS-DOS or Windows NT directory (i.e. used by NOPEN\$, NLIST\$ and NCLOS\$) or command (i.e. used by SHCMD\$) to be created, read or updated. **Important Note:** This subroutine will only function correctly on GSM V8.1g, or later;
- The \$SETIRU utility has been replaced by \$SCHEMA. In addition to all the functionality formerly included in \$SETIRU, \$SCHEMA allows the Schema Files used by "Open TFAM", SHCMD\$ and NOPEN\$, NLIST\$, NCLOS\$ to be created and maintained;
- DEVIN\$ now returns a new field, DNDNGP, which contains the "directory gap" for a domain volume format. Note that DNDGAP contains the "directory gap" for a diskette volume format. The DNDGAP field is of little (no) use for external developers and is returned by DEVIN\$ only to provide compatibility with earlier versions of GSM;
- A new subroutine, FINFO\$, is available to provide extended information regarding a specific file;
- A new subroutine, LINFO\$, is available to provide extended information regarding a specific program library;
- A new subroutine, ELIST\$, is available to provide a super-set of the file information provided by the LIST\$ subroutine;
- A new subroutine, USTAT\$, is available to provide extended information regarding the layout of a domain;
- The release of these new sub-routines has necessitated the introduction of a new compilation library, C.\$MCOB2. The creation of this new library has required a minor reorganisation of the sub-routines within the existing C.\$MCOB library (C.\$APF has not been affected by these changes). The extra library should not affect Global Cobol Developers (because the location of the required compilation libraries is held in the \$\$LINK file) but may affect Global Speedbase developers (because the names of the compilation libraries must be specified explicitly to \$SDL). The following changes to the sub-routine libraries have been implemented for Global System Manager revision V8.1g:

C.\$MCOB	CH\$A (DBUF\$) moved to C.\$MCOB2
	IR\$A (SUBS\$) moved to C.\$MCOB2
	OR\$A (OPMES\$) moved to C.\$MCOB2
	QH\$A (BUFF\$, CAFGR\$ & CAFGW\$) moved to C.\$MCOB2

- QT\$A (CEVER\$) moved to C.\$MCOB2
- C.\$APF No changes
- C.\$MCOB2 All the new non-paged subroutines are in this library
See above for the 5 modules moved from C.\$MCOB
- C.\$PAGES New Open TFAM paged subroutine

IMPORTANT NOTE: DURING THIS MINOR LIBRARY RE-ORGANISATION SOME INCONSISTENCIES WERE FOUND IN THE ALLOCATION OF SUB-ROUTINES BETWEEN C.\$APF AND C.\$MCOB. A MUCH LARGER RE-ORGANISATION (RATIONALISATION) OF THE SUB-ROUTINE LIBRARIES IS PLANNED FOR THE NEXT RELEASE OF THE GLOBAL COBOL DEVELOPMENT SYSTEM.

- All the new Speedbase Btrieve STOP and EXIT codes (see Appendix C) have been included in the \$\$ERREX and \$\$ERRST databases;

The following changes to the Global Speedbase Development System have been implemented:

- The \$SDE editor no longer aborts the edit if an invalid unit assignment is supplied to the dialogue generated by the "X" command.

The following changes to Global File Converters have been implemented:

- The titles of the Global System Manager (Unix), Global System Manager (MS-DOS and Novell Netware) and Global System Manager (Windows) File Converters have been rationalised.

The following changes to Global Configurator have been implemented:

- The problem that causes CFUPDATE to fail with a PGM CHK-11 when more than 127 users are defined in the configuration file has been fixed. Note that a configuration file with more than 99 users is still considered invalid and will result in an error message at the end of the edit phase;
- CFUPDATE now displays the Console Index Number (i.e. an incrementing number starting from 1) in square brackets during the CONSOLE CONTROLLERS section of the edit phase. For example:

```
CONTROLLER [ 1] (CONSOLE ):
```

- CFUPDATE now displays the Printer Index Number (i.e. an incrementing number starting from 1) in square brackets during the PRINTER CONTROLLERS section of the edit phase. For example:

```
CONTROLLER [ 1] (HYPER ):
```

- CFUPDATE allows the Number of Edit Areas (i.e. internal control blocks used by CFUPDATE) to be changed from the default value of 250. This option will only be required if the EDIT AREA FULL message appears when attempting to create a very large configuration file. To change the number of Edit Areas, run *INSTALL (sic) from library P.CF and reply E to the following prompt:

```
AUTO, CREATE, UPDATE OR PRINT?
```

After supplying the CONFIGURATION FILE and UNIT you will be prompted for the Number of Edit areas:

SPECIFY EDIT-AREA SIZE (250):

Any value between 150 and 500 is allowed;

If this EDIT AREA FULL work-around has to be used repeatedly then it may be convenient to create a small (\$JOB) job that sets the Number of Edit Areas to the desired value. For example:

```
JOB CF500  UPDATE CONFIG. FILE
PARAMETER DIVISION
&1  X(8)  CONFIGURATION FILE
&2  X(3)  UNIT
DIALOGUE DIVISION (SUPPRESS)
$90 READY:P.CF
$90 READY:*INSTALL
AUTO, CREATE, UPDATE OR PRINT?:E
CONFIGURATION FILE:&1
UNIT:&2
SPECIFY EDIT-AREA SIZE:500
ENDJOB
```

Readers may be interested to know that CFUPDATE is itself a small job initiator that runs the "U" option of *INSTALL:

```
JOB CFUPDATE V8.1 UPDATE CONFIG. FILE
DIALOGUE DIVISION (SUPPRESS)
$90 READY:P.CF
$90 READY:*INSTALL
:U
ENDJOB
```

- CFPRINT now includes the Console Index Number and Printer Index Number in the configuration file print report.

2.6 Global System Manager V8.1 revision V8.1h

Global System Manager V8.1 revision V8.1h includes several new features and significant enhancements to Global System Manager V8.1, revision V8.1g.

Before attempting to use \$CUSUPD (\$CUS, System Maintenance, Upgrade GSM revision) to upgrade from GSM V8.1g to V8.1h please read "IMPORTANT NOTE 6" in section B.1.

The following changes to run-time Global System Manager have been implemented:

- The spooler, \$SP, has been enhanced to suppress displays when running in a background partition on a "GUI screen". This change prevents the spooler from being permanently suspended when the Global Windows Workstation is being used. Note that the modification to \$SP for GSM V8.1f (described in section 2.4) did not solve the problem under all circumstances.

In addition, \$SPOOL has been modified to update the \$\$SPOOL file on \$M (creating a new \$\$SPOOL file if necessary). The \$\$SPOOL file is reserved for future use;

- \$ZAP now allows the name of the zap file to have any file prefix. The changes for GSM V8.1g caused \$ZAP to treat a prefix other than Z. or E. as invalid. For example, multi-part zap files "a.ZAP" and "b.ZAP" are now allowed;
- A problem that caused \$S to suffer a PGM CHK 11 when displaying the GSM (DOS) or GSM (Novell) BACNAT variant under some conditions (i.e. when the NUMBER OF ASSIG\$ TABLES is set to a non-zero value) has been fixed;
- A problem that caused <SYSREQ> S to corrupt the Reset Sequences File has been fixed. The problem occurs if lines are deleted from the Reset Sequences File;
- Two new specialised TAP's (\$.716 and \$.717) have been produced for use with the Global Windows Workstation (GUI). The STATUS LINE option has been removed in both \$.716 and \$.717;
- Two new specialised TAP's (\$.206 and \$.207) have been produced for use with the TCL Nyce terminal. The 132-WIDE option has been removed in both \$.206 and \$.207;
- The Menu Handler, \$MH, has been enhanced to allow Btrieve format Speedbase databases on GSM (Windows) configurations to be loaded by "E" and "F" menu lines;
- \$AUTH has been enhanced to run \$BYE (rather than \$E) if the maximum number of sign-on attempts has been exceeded on a single-user workstation (e.g. on a typical GSM (Novell NetWare) workstation). In addition, the PLEASE KEY PASSWORD prompt displayed by \$AUTH now appears in full on GUI screens;
- \$VOLSAV has been improved to fix a problem that can result in a hang when restoring a domain with a large number of sub-volumes. The same problem can also cause just the first few sub-volumes to be allocated

repeatedly. A problem that prevents \$VOLSAV from restoring a domain on a different server from which the domain layout was saved, has been fixed.

If the reply to the "Key domain unit id" prompt is terminated with <CTRL A> the \$V job dialogue used to recreate the domain layout will be displayed;

- \$U correctly displays the number of heads for a disk with more than 127 surfaces (previous versions of \$U reported a value of 1 if a disk has more than 127 heads).

\$U does not report a CAPACITY value for "T" format Discrete Data File (DDF) domains (aka Separated Subunit Domains (SSD)). Since the filing system generally contains files of the host operating system, the available capacity for Global files is (at best) meaningless or (at worst) confusing.

\$U automatically displays the details of all file-server systems on Global System Manager (Windows) configurations. The behaviour on Global System Manager (Windows) is now consistent with Global System Manager (Unix) and Global System Manager (Novell NetWare).

A reply of "B" to the main \$U prompt allows details of the local computer to be redisplayed on networked or Global System Manager (Unix) configurations;

- A new run-time utility, \$SFMAIN, has been released to provide a subset of the functionality provided by the Toolkit \$SCHEMA utility. \$SFMAIN allows the Schema Files used by "Open TFAM" (i.e. Text Schema Files), SHCMD\$ (i.e. Command Schema Files) and NOPEN\$, NLIST\$, NCLOS\$ (i.e. Directory Schema Files) to be created and maintained.

The following changes to Global System Manager installation have been implemented:

- The installation process for GSM V8.1 revision V8.1g GSM PM configurations introduced a problem that resulted in an internal flag being left in a state that incorrectly indicated a "non-PM" configuration. This problem has been fixed in V8.1h;
- A problem that can cause an EXIT 6801 when installing Global System Manager PM (Windows) from media other than diskette has been fixed. This problem will not occur on externally released software.

The following changes to Speedbase Presentation Manager have been implemented:

- The \$BADN utility has been enhanced to create and maintain Btrieve format Speedbase databases on Global System Manager (Windows) configurations. See sections C.6 and D.8 for a full description of this utility;
- The \$BADGN utility has been enhanced to recognise Btrieve format Speedbase databases on Global System Manager (Windows) configurations;
- The \$BAST utility has been enhanced to recognise Btrieve format Speedbase databases on Global System Manager (Windows) configurations;

- The \$BASTS utility has been enhanced to recognise Btrieve format Speedbase databases on Global System Manager (Windows) configurations;
- Speedbase Presentation Manager now redisplay the mode of the parent-frame (in addition to the name of the frame) when a child-frame exits and control returns to the parent-frame.

The following changes to the Global Cobol Development System have been implemented:

- \$SCHEMA now allows the Windows NT specific parameters to be supplied for a "Server mode" Command Schema File;
- SCHEM\$ now validates the SCTYPE field in the Schema File preventing a problem that resulted in an unexpected EXIT WITH 3.

In addition, SCHEM\$ has been enhanced to allow the 3rd parameter to be supplied to SVC-70 on Global System Manager (Windows) configurations;

- A bug in SHCMD\$ that caused unpredictable problems on Global System Manager (Windows NT configurations) has been fixed.

In addition, SHCMD\$ has been enhanced to allow the 3rd parameter to be supplied to SVC-70 on Global System Manager (Windows) configurations;

- A number of minor problems in the Open TFAM Access Method have been fixed. **DEVELOPERS USING THE OPEN TFAM ACCESS METHOD ARE STRONGLY ADVISED TO RE-LINK THEIR APPLICATION TO REPLACE THE V8.1g VERSION OF OPEN TFAM BY THE V8.1h VERSION;**
- The Open TFAM Access Method has been enhanced to allow a block size larger than 256 bytes. This new interface is not available for external use and has been documented here for completeness only;
- A problem with the Open Speedbase Access Method (SPAM) has been fixed. This problem, which only affects Global Reporter, is unlikely to be encountered by any external developers. The problem is solved in the \$PA025 and \$PA026 run-time components and does not require a re-link of any application code;
- A problem with the SPAM Access Method, involving the READ LAST function when accessing a Btrieve format Speedbase database via a partial key, has been fixed;
- The following DMAM subroutines: DBSTA\$, IRBLD\$, DTOPN\$, DBREK\$ and DBKES\$ have been re-released to operate correctly with Btrieve format DMAM databases. **DEVELOPERS USING DMAM WITH BTRIEVE FORMAT DMAM DATABASES ARE STRONGLY ADVISED TO RE-LINK THEIR APPLICATION TO REPLACE THE V8.1g VERSIONS OF THE DMAM SUBROUTINES BY THE V8.1h VERSIONS.**

THE DMAM-BTRIEVE OPTION IS NOT FOR GENERAL-USE AND SHOULD ONLY BE USED BY SPECIALISED, BESPOKE APPLICATIONS.

The following changes to the Global Speedbase Development System have been implemented:

- The B\$OPN sub-routine has been enhanced to recognise Btrieve format Speedbase databases on Global System Manager (Windows) configurations.
SPEEDBASE DEVELOPERS WHO WISH TO USE THEIR APPLICATIONS WITH BTRIEVE FORMAT SPEEDBASE DATABASES ON GLOBAL SYSTEM MANAGER (WINDOWS NT) CONFIGURATIONS MUST RECOMPILE USING THE V8.1h B\$OPN SUBROUTINE.

No changes to Global File Converters or Global Configurator have been implemented for GSM V8.1 revision V8.1h.

2.7 Global System Manager V8.1 revision V8.1i

Global System Manager V8.1 revision V8.1i includes several new features and significant enhancements to Global System Manager V8.1, revision V8.1h.

Global System Manager V8.1i is a pre-requisite for both Global 3000 V4.5 and Global Reporter V1.4.

The following changes to run-time Global System Manager have been implemented:

- The GSM start-up processing now loads memory pages from both the P.\$G3PGS and P.\$BRPGS memory page libraries. These optional libraries are selected when GSM is installed (see below). Furthermore, the start-up processing now loads any memory pages present on the BACRES volume (for subsequent use during installation);
- An **EXTREMELY SERIOUS** problem in \$E which results in a screen hang when signing out with a GUI TAP (e.g. \$.711) has been fixed. In addition the logic in \$E which displays an escape sequence on Global System Manager (Windows) configurations to suppress the Contract Protection Message is now sensitive to the setting of the "GlobalWindowsWorkstation" setting in the registry (see section 5.6) for further details);
- \$D now allows a wider range of "post Speedbase PM expiry date" dates close to, and in, the 21st century. The following special dates bypass the PM expiry date checking and can be set by \$D to allow Y2K compatibility testing:

25-Dec-1999 to 7-Jan-2000, inclusive
 28-Feb-2000 to 29-Feb-2000, inclusive
 28-Feb-2004 to 29-Feb-2004, inclusive

Furthermore, the check for a Reseller System has been relaxed allowing a "post Speedbase PM expiry date" to be set on End-User systems. In addition, \$D writes an event (with an Application Code of "c") to the Event Log file whenever a date/time change is applied;

- Menu Maintenance, MN, has been enhanced considerably:
 - Within the Amend Screen function, <UP ARROW> correctly returns to the previous option, instead of to the top of the screen;
 - The problem that resulted in a spurious character appearing when an (illegal) attempt is made to set the \$DP or \$CP assignment, has been fixed. A number of other "spurious character" problems in other functions within Menu Maintenance have been fixed;
 - The "Copying Menu File to work unit..." message always appears on the baseline, instead of a random line on the screen;
 - The Amend Menu dialogue has been enhanced to allow a "GUI bitmap index number" to be associated with each menu line. The "GUI bitmap" handling is fully described in the Global Windows Workstation V2.3 Notes;

- The Amend Menu dialogue has been enhanced to allow a “Run in text mode” flag to be associated with each menu line. This flag should set to “Y” for those menu lines that initiate Global 2000 applications (e.g. Payroll) that do not operate correctly when used with terminal type \$.711 etc.;
- The Amend Menu dialogue has been enhanced to indicate a 32-bit Speedbase Frame when amending or inserting a type “E” or “F” menu line. This option is reserved for future use;
- The Amend Menu display parameters option has been enhanced to allow a new “Pop Menu” menu style. This option is only allowed on Speedbase PM configurations;
- The Amend Menu display parameters option has been enhanced to include a new “GUI command box” option. If this option is disabled keying “\$” to a menu prompt will switch the display into text mode allowing a “\$” command (e.g. \$F) to be keyed directly from the menu, without the requirement to key <F1> to invoke a Command Box. This option is only recognised when using a GUI screen (e.g. with terminal type 711) with the Global System Manager (Windows) “GUI” controller or the Global Windows Workstation;
- The dialogue displayed when a menu file is in-use has been improved to include an Abandon update option.
- The Menu Handler, \$MH, has been enhanced considerably:
 - The Menu Handler has been enhanced to recognise the “GUI bitmap index number” (see above);
 - The Menu Handler has been enhanced to recognise the “Run in text mode” flag (see above);
 - The Menu Handler has been enhanced to recognise the “32-bit Speedbase Frame” option (see above);
 - The Menu Handler has been enhanced to recognise the new “Pop Menu” menu style (see above);
 - A number of error and warning messages/prompts (e.g. Unassigned Units) are now displayed correctly on a GUI screen (e.g. with terminal type 711);
 - A problem that caused a NO BASE exception when keying <F1> followed by <F2> to the menu prompt has been fixed;
 - The following menu line options can be configured “on the fly”, without recourse to Menu Maintenance, by keying <F4> to the menu prompt:
 - Password
 - Authorization level
 - GUI bit map

This option can only be used by supervisors (i.e. <F4> has no special meaning for operators with an Authorization Level of "A" to "R");

- The Menu Handler always forces the display of the "base menu" when used on a GUI screen (e.g. with terminal type \$.711) to prevent the apparent "hanging" problem that can occur when \$AUTH has been used to automatically select a secondary menu;
- A number of problems in \$MHCUS when customising large menu files have been fixed;
- It is now possible to AMEND SAA-style menus. Thus, software installation jobs that use the AMEND option to create or update menu lines will now operate correctly with SAA-style menus;
- The <F2> and <F3> keys can be used to invoke application-specific options. Note that <F2> and <F3> are only recognised in SAA-style or Pop-Menu style menus.
- The default size of a new User File (i.e. \$\$USER) has been increased from 2000 to 20,000 bytes (allowing a maximum of 1000 users);
- \$BBS has been enhanced to operate on Global System Manager (Unix) configurations (in addition to GSM (Windows), GSM (Novell) and GSM (DOS) configurations). In addition, the problem that could result in an ILL LOAD AT 2588 when the \$BBS List Directory option is used on GSM (Windows) has been fixed;
- \$CUS has been enhanced to forbid an Authorisation program that starts with "\$\$". This check has been added to prevent the simple mistake that can occur if the \$\$AUTH file (i.e. instead of the \$AUTH program) is specified in \$CUS. Furthermore, the problem that resulted in an EXIT WITH 1 when keying <ESC> to the PLEASE ASSIGN \$PR prompt when attempting to print the details of a Printer Control File, has been fixed. In addition, the Printer Control File overlay (\$CUSP) now allows the Printer Page Depth to be specified (for subsequent use by the PAGE\$ sub-routine – see below).

The \$CUS System Maintenance, Install Extra Facilities menu includes two new options to install the Global 3000 V4.5 and Global Reporter V1.4 memory pages. These options allow the P.\$G3PGS and/or P.\$BRPGS memory page libraries to be installed after the installation of GSM (see below);

- An obscure problem with the Debug System has been fixed. The problem results in a STOP WITH -4 if the RUN verb is executed within an application while a temporary item is on the User Stack;
- The problem in GSM start-up, terminal setting overlay (\$DETAP) that results in a MEMORY VIOLATION if a Reset Sequence file, \$\$RSnnn, is created on a GSM (Unix) configuration, has been fixed;
- \$DLIB now allows configuration files (type IN) to be included in Data Libraries;
- A number of problems in \$EXEC have been fixed. The calculation of the "next run" is now consistent and works correctly over midnight.

In addition, another problem which caused a “next run” time of 24:00 to be ignored completely has also been fixed;

- The \$F CMP command now recognises the P.\$G3PGS (Global 3000 V4.5) and P.\$BRPGS (Global Reporter V1.4) memory page libraries;
- A problem in \$INSPECT that caused an ILLEGAL LOAD AT 221C when an invalid reply is given to some of the base-line prompts has been fixed;
- A new utility, \$LNAT, is now available to provide a “\$L look-alike” facility for DOS, Windows and Unix files;
- \$LOG has been amended to fix the STOP WITH 201 problem that occurs when attempting to use the purge option twice in succession. The reports available with \$LOG are now Y2K compliant (as is the version of Global Reporter run-time (i.e. V1.1) which is installed when the Global System Manager Event Logging option is selected);
- An alternative version of \$LOG, \$LOGP, which excludes the purge option from the main menu, is now available. The “hidden” Purge option, which is selected by keying “PURGE” to the menu prompt, writes an entry to the Event Log File. The event log record includes the purge date and a list of the purge options used (e.g. “BEJMRZ” if all the purge options were selected; “B-J-R-“ if only the “BJR” options were selected, “-----Z” if only the “Z” option was selected);
- A number of minor problems in \$MAIL have been fixed. The cursor position is now updated correctly when a mail item is deleted. \$MAIL checks that the \$ML unit is assigned before allowing a mail message to be entered. When a mail item is marked as being read it is correctly removed from the list of outstanding mail messages. The initial “Accessing \$MAIL message” message is suppressed when running on a GUI screen. The mailbox now includes an option to automatically clear the status line when exiting \$MAIL or the <SYSREQ N> System Request. The long operator-id is now displayed with the mailbox information. It is now possible to print a mail item that has just been received. All recipients are now warned that an un-read mail message has been deleted by the sender. A Back option is now available when paging through the list of mail messages;
- A minor, cosmetic problem in \$MNDISP has been fixed;
- The Global System Manager “reset logic” (in \$MONITOR) has been enhanced to reset the “GUI mode”, when returning to the menu or READY: prompt, if “GUI mode” has been switched off by an application or utility;
- The Debug Diagnostics overlay has been modified to allow a reply of D<CTRL C> to the “Activate Debugger” prompt to allow the \$PR unit to be modified thus allowing the print unit of the D.DIAGN file to be selected “on the fly”;
- The width of the title line printed by \$PRINT has been reduced to less than 80 characters;

- \$RCP will now play back a script file with more than 9,999 lines (the maximum line count is now 999,999,999 lines). Note that this change has been added for a specialised application – you are still recommended to split a large playback script into several smaller scripts and use the CHAIN and/or EXEC options. Note that the limit of 9,999 lines still applies when recording and creating playback scripts;
- \$SFMAIN has been enhanced to extend the maximum length of the command string from 79 to 255 characters;
- \$SP now includes an option to list the spooler files in descending order of date (i.e. the most recent files first with the oldest file on the last page of the spooler report). This new feature is enabled by selecting the “RE” option. Note that “RE” is not currently included in the list of spooler options;
- To prevent the PGM CHK 10 AT FOCC problem that occurs on GSM (Unix) configurations if a “common” printer has been customised to “throw a page at start-up”, the GSM start-up processing ignores the “throw page at start-up” customisation for “common” printers (i.e. those printers with a Printer Control File name of \$\$P5nn on unit \$M);
- All extra assignment tables (i.e. those allocated when the NUMBER OF EXTRA ASSIG\$ TABLES is nonzero) are now purged by the GSM start-up processing thus preventing “stale” entries remaining over separate GSM sessions;
- The Global System Manager start-up code has been enhanced to allow a System Date beyond 31-Dec-2059. Furthermore, the problem that results in a PGM CHK-11 AT 4D4C if a PC is left at the “Please confirm date” prompt for several hours/days (depending on the speed of the PC), has been fixed;
- \$STATUS has been enhanced to display the Terminal Code (i.e. TAP number) associated with each user. The report produced by the PRI command includes a full operator list. \$STATUS has been modified to fix the problem that is responsible for the spurious FAILED CONNECTION message on the NLM Connection Screen on GSM (Novell) configurations. The warning message displayed by \$STATUS when the PURge command is used has been changed to:

WARNING - You MUST reboot ALL computers

to emphasis the importance of the warning. The warning message “MASTER COMPUTER HAS BEEN REBOOTED” is now displayed immediately by \$STATUS. A number of problems in the CDE command (which result in a STOP 201 or corruption of the Screen Description file, \$\$SDES) have been fixed. The LSF command now functions correctly on non-LAN configurations;

- \$T has been enhanced to include a new option to allow the characters generated by various keystrokes to be logged in a report file. This new feature is selected from option 10 of the DIAG main menu;
- \$U has been modified to fix the PGM CHK 11 at 21A4 problem that can occur on partitioned hard-disk on GSM (BOS) configurations;

- \$V has been modified to fix the PGM CHK 11 AT 79E8 problem that can occur when attempting to display the Domain Error Map;
- \$ZAP has been enhanced to fix a number of problems that can occur when zaps are applied and removed in the same session of \$ZAP. Furthermore, the problem that disables “previous content checking” when a zap which does not check for previous contents is applied before one, or more, zaps that do check for previous contents, has been fixed;
- A new utility, \$ZAPNAT, is now available to apply a zap (created using \$PATNAT) to a non-Global file on GSM (Windows), GSM (Unix), GSM (Novell) and GSM (MS-DOS) configurations;
- A number of new Terminal Attribute Programs (TAP’s) are now available;-

\$.29 Based on \$.19 (VT-100) but uses <CTRL X> as the System Request key, instead of <BACKSPACE>;

\$.227 Based on \$.207 (TCL NyceBase) but uses 8-bit characters for the box and line drawing characters to include the ½ height box character;

\$.267 Based on \$.167 (Wyse 60) but does not explicitly enable XON/XOFF hand-shaking which may cause problems at some GSM (Unix) sites;

\$.269 Based on \$.169 (Wyse 60) but does not explicitly enable XON/XOFF hand-shaking which may cause problems at some GSM (Unix) sites;

\$.718 New TAP for use with Global Windows Workstation or GSM (Windows). Please refer to the Global Windows Workstation Notes (MGUNV2.3) for further details;

\$.719 New TAP for use with Global Windows Workstation or GSM (Windows). Please refer to the Global Windows Workstation Notes (MGUNV2.3) for further details;

\$.720 New, highly specialised TAP, with Danish character set translation, for use with Global Windows Workstation or GSM (Windows);

\$.721 New, highly specialised TAP, with Danish character set translation, for use with Global Windows Workstation or GSM (Windows);

\$.722 New, highly specialised TAP, which switches the GUI into a “PCWS compatibility” mode, for use with Global Windows Workstation or GSM (Windows);

\$.730 TAP for use with GLCONS.EXE on Global System Manager (Windows) on Window NT. See the GSM (Windows) Configuration Notes for further details;

- \$.731 TAP for use with GLCONS.EXE on Global System Manager (Windows) on Window 95 and Windows 98. See the GSM (Windows) Configuration Notes for further details;
- \$.733 TAP for use with GLCONS.EXE on Global System Manager (Windows) on Window 95 and Windows 98, which includes pound/hash translation. See the GSM (Windows) Configuration Notes for further details;

Important note: The descriptive text for all the “GUI TAP’s” has been improved to allow the various TAP’s to be easily differentiated;

- GSM (BOS) now correctly handles a system date later than 31-Dec-1999 (note that this problem has already been fixed by zaps to earlier revisions of GSM V8.1 and to GSM V8.0 – the fix is now compiled in GSM V8.1i). This problem does NOT affect GSM (DOS), GSM (Novell), GSM (Unix) or GSM (Windows) configurations;
- The <SYSREQ K> System Request has been modified to fix the hanging problem that can occur if a file error condition occurs on the \$\$FKxxxx file. Furthermore, this system request now displays an immediate warning message if a Function key buffer is unavailable;
- The GSM help books have been upgraded to describe the new \$SP and \$INSPECT options.

A number of changes to Global System Manager installation have been implemented.

Important note: The dialogue for the GSM V8.1i installation differs slightly from the dialogue for previous revisions of GSM V8.1. Firstly, new dialogue, involving one or two extra prompts (see below) has been added. Secondly a number of prompts have been removed when installing GSM V8.1i on GSM (Windows).

The following changes have been implemented:

- The memory pages required by Global 3000 V4.5 and Global Reporter V1.4 are now distributed with, and optionally installed by, Global System Manager. The following extra prompt will appear during GSM installation:

[A.43] Do you want to install the Global 3000 V4.5 system routines? (N)

If the reply is “Y” both the P.\$G3PGS and the P.\$BRPGS memory page libraries will be copied to SYSRES and the number of pages increased accordingly. If the reply is “N” the following prompt will appear:

[A.44] Do you want to install the Global Reporter system routines? (N)

If the reply is “Y” the P.\$BRPGS memory page library will be copied to SYSRES and the number of pages increased accordingly.

Important note 1: If both the P.\$G3PGS and P.\$BRPGS libraries are installed a total of 7 additional 2Kb memory pages will be installed thus reducing the memory available for memory banks on GSM (BOS),

GSM (DOS) and GSM (Novell) configurations by a total of 14Kb. This may result in the loss of a complete memory bank (depending on the actual memory arrangement). The installation of the 7 extra memory pages will not affect the memory arrangement on GSM (Unix) or GSM (Windows) configurations.

Important note 2: Both the P.\$G3PGS and the P.\$BRPGS memory-page libraries will be installed automatically by the \$CUSUPD revision upgrade mechanism;

- The GSM installation job has been modified to fix the PGM CHK 11 that occurs when installing onto a GSM (BOS) partitioned hard-disk. Furthermore, a number of unnecessary prompts are suppressed when installing a GSM (Windows) configuration;
- An example Printer Control File (PCF) for the Hewlett Packard LaserJet-5 printer is distributed with Global System Manager. This example PCF, \$RPSTA04 (sic), is not automatically installed but must be copied, and renamed (to \$\$P5nn or \$\$P5nnxx) as appropriate;
- The following prompts will no longer appear when GSM (Windows) is installed:
 - A.31 Do you want Event Logging installed?
 - A.34 Do you want operator groups installed?
 - A.37 Do you want to install the Global mailing system?
- The P.\$TAP library is now large enough to hold all the TAP's copied when the "A" for all TAP's option is selected during installation.

The following changes to Speedbase Presentation Manager and Speedbase utilities have been implemented:

- An **EXTREMELY SERIOUS** problem in the Speedbase PM date handling has been fixed. The problem applies to any Speedbase PM date accept operation (either Windows based or in an ACCEPT...LINE construct) if there are 2 numeric characters remaining in the Accept buffer at positions 9 and 10. If the long date formed by the short-date and the two extra characters is valid it will be used instead of the intended short-date. This problem is also described in Global Technical Bulletin GT871 (28-July-1998).

In the following description, a "normal" Century Boundary Year customisation (e.g. 1950 or 1960) is assumed: The year corruption problem occurs if the characters in positions 9 and 10 of the last Speedbase accept, when appended to the end of the PIC X(8) short-date (i.e. DD/MM/YY or MM/DD/YY), cause the "redefined" PIC X(10) long-date (i.e. DD/MM/CCYY or MM/DD/CCYY) to become a valid date. Under these conditions, the value of the "long-date" is used instead of the expected short-date.

For example, assume the field accepted immediately before a short-date is a PIC X(10) containing the value "ABCDEFGH12" and the short-date keyed is "13/02/00" (i.e. specifying a date of 13/02/2000), Speedbase will incorrectly treat the reply as 13/02/0012 which will be interpreted as the long date 13/02/2012 and redisplayed as the short-date 13/02/12.

As a further example, if the field accepted immediately before a

short-date is a PIC X(10) containing the value "ABCDEFGH56" and the short-date keyed is "13/02/17" (i.e. specifying a date of 13/02/2017) Speedbase will incorrectly treat the reply as 13/02/1756 which will be interpreted as the long date 13/02/1756 and redisplayed as the short-date 13/02/56.

The problem does not occur when a short-date towards the end of the 20th century is keyed. Repeating the 2nd example with a short date of "13/02/99" (i.e. specifying a date of 13/02/1999) Speedbase will firstly attempt to treat the reply as 13/02/9956 which will be rejected as an invalid long-date. This invalid long-date will cause the (correct) short-date 13/02/99 (i.e. 13/02/1999) to be used;

- The problem that results in a GVA corruption in C-ISAM format Speedbase databases when a servant record is written with a primary index key which already exists on the database, has been fixed;
- A number of new Speedbase TAPs are now distributed with Speedbase PM: T>713, T>714, T>715, T>716, T>717, T>718, T>719;
- \$BA has been relinked with the new B\$OPN and B\$XCL routines (see below);
- All Speedbase utilities, including \$BAST and \$BASTS, have been modified to operate in "text mode" when used with a Global Windows Workstation "GUI TAP" (e.g. \$.711);
- \$BACUS has been extensively enhanced. An existing T>nnn file can be used as a template when creating a new Speedbase TAP. A warning message is displayed when <ESC> is keyed to avoid an immediate abandonment. The current terminal type is displayed. A warning is issued if the pen and ink colours for a colour combination are identical. Several spelling mistakes have been corrected. The problem that resulted in the spurious "Too many different attributes specified - Please simplify" message has been fixed;
- \$BADGN has been extensively enhanced: The current units for the existing index and data-files are used as defaults for the new database (earlier versions of \$BADGN always defaulted the unit(s) for the data-files to the unit of the index file which often made database conversions difficult to manage). The STOP 201 problem that could occur when entering the data-file details has been fixed. When running \$BADGN under Job Management the default replies for the "Data concentration" and "Overwrite existing database" prompts are assumed (to allow \$BADGN to be used under Job Management). The problem that resulted in an empty error report file has been fixed;
- \$BADN has been extensively enhanced. An Exit option (option 7) is included on the main menu for use under Job Management. \$BADN now supports the "Change Path to Database" option on Global System Manager (Windows). The problem that results in an error with \$RES = 3 under some conditions in the database conversion option (option 4), has been fixed;
- \$BADB has been enhanced to include an Exit option (option 7) on the main menu for use under Job Management. In addition, the problem that caused an ILLEGAL QUALIFIER AT 2020 when using the "Dump C-ISAM database" option has been fixed.

The following changes to the Global Cobol Development System have been implemented:

- \$PATCH has been modified to fix the problem that results in a PGM CHK 11 when small data files (i.e. not type PL) are patched;
- A new utility, \$PATNAT, is available to patch non-Global files on GSM (Windows), GSM (Unix), GSM (Novell) and GSM (MS-DOS) configurations;
- \$RECOVER has been modified to fix a number of problems that can occur when attempting to recover corrupt ISAM files;
- \$SCHEMA has been enhanced to allow commands strings that are longer than 79 characters. The new limit is now 255 characters;
- \$SCOMP has been enhanced to recognise source files within Data Libraries;
- \$DEV has been upgraded to support the "N" option for use with the 32-bit Speedbase compiler, \$SDL32;
- \$ED has been modified to fix the problem that results in a STOP 1601 if a source file contains more than 9999 lines;
- DBMAIN has been modified to fix the problem that results in a spurious "PLEASE ASSIGN " message under some circumstances;
- Two severe problems in the memory page version of DMAM have been fixed. The first problem causes unexpected exceptions under a variety of circumstances (particularly on READ FIRST operations). The second problem causes the wrong translation table to be used in some circumstances. Both of these problems are fixed by the V8.1i DMAM memory-pages so there is no requirement to re-link any application code;
- Two problems in the Open SPAM paged sub-routine have been fixed. The symptom of the first problem is that first record is always returned by the Read First or Read Last operations. The second problem can result in a variety of unpredictable results from the Open SPAM Access method. Both these problems are fixed by the V8.1i \$PA025 memory page so there is no requirement to re-link any application code;
- A number of problems with the Speedbase Btrieve Access Method (SPAM) have been fixed. SPAM now functions correctly on Btrieve format databases on GSM (Windows) configurations. A problem that causes a variety of symptoms (e.g. spurious End of File exceptions) when two Speedbase databases with Schema files on different domains are accessed using SPAM, has been fixed. These problems are fixed by the V8.1i \$PA025 memory page so there is no requirement to re-link any application code;
- The Open TFAM sub-routine has been modified to fix a variety of problems that occur when reading Global format TFAM files. The Open TFAM Close operation has been modified to remove the code that writes a spurious ^Z to the end of the output file when running on a GSM (Windows) configuration. These problems are fixed by the V8.1i

\$PA025 memory page so there is no requirement to re-link any application code;

- The Screen Formatting sub-routine has been modified to fix the problem when accepting fields that have been specified with the "I" (Invisible) attribute. The problem results in an INVALID message if the reply is shorter than the field length;
- A new sub-routine, BIOS\$, is now available, for use on GSM(BOS) , GSM (MS-DOS) and GSM (Novell) configurations to allow direct calls to the PC BIOS. Details of this potentially dangerous sub-routine, WHICH MUST BE USED WITH EXTREME CARE, are available upon request;
- A new subroutine, TIME2\$, is available to return the current time in the format HH:MM (cf. the existing TIME\$ routine, which returns the time in HH:MM:SS format);
- The \$\$ULEV System Variable is now defined correctly as a PIC 9(4) COMP field;
- The BASEX\$ sub-routine has been enhanced to treat only <CR> or <ESC> as terminators. Other keystrokes, such as <UP-ARROW> and <DOWN-ARROW> are not treated as terminators;
- The DBREK\$ routine has been modified to fix the problem that causes a spurious Record Not Found exception when reading on a non-unique index;
- A new subroutine, DENAT\$, is now available to allow the deletion of non-Global files on GSM (DOS), GSM (Novell), GSM (Unix) and GSM (Windows) configurations;
- The DEVIN\$ sub-routine has been modified to fix the problem that causes a PGM CHK 11 when used on a partitioned hard-disk on a GSM (BOS) configuration;
- Memory page versions of the following Global Cobol sub-routines are now available:

```
DIVID$
DOWK$
DT-DY$
EDIT verb internal sub-routine
MULTI$
ZERO$
```

IMPORTANT NOTE: Any application (e.g. Global 3000 V4.5 and Global Reporter V1.4) that uses these memory page sub-routines will only operate with Global System Manager V8.1i, or later:

- A new sub-routine, CHKPG\$, is now available to determine whether a particular memory page is loaded. This sub-routine, which is used by Global 3000 V4.5 and Global Reporter V1.4 will only operate on the following executive versions and BACNAT revisions:

Host o/s system	Config code	Requirement for CHKPG\$
BOS	57nn	+J0N000 (in +.J0) V8.1S, or later

MS-DOS, Windows	562n	+JON000 (in +.JO) V8.1S, or later
Novell	561n	+JON000 (in +.JO) V8.1S, or later
Unix	55nn	BACNAT V3.264, or later
Windows 95, 98, NT	566n	BACNAT V2.7, or later

- Alternative (smaller) versions of TYP\$ and TYPF\$ with reduced functionality are now available upon request;
- A new sub-routine, NPART\$, is now available to return the number of partitions for the current screen;
- A new sub-routine, PAGE\$, is available to obtain the default page depth of a particular printer;
- A new sub-routine, PURGE\$, is available to purge the contents of the \$MLOG Event Log file;
- A new sub-routine, RENAT\$, is available to rename non-Global files on GSM (DOS), GSM (Novell), GSM (Unix) and GSM (Windows) configurations;
- A new sub-routine, SBTYP\$, is available to determine the nature of a Speedbase database (i.e. this sub-routine can be used to differentiate between Global format, C-ISAM format, Btrieve format and SQL Server format Speedbase databases);
- The SCHEM\$ routine has been enhanced to allow command strings longer than 99 characters. The maximum command length is now 255 characters;
- The SHCMD\$ routine has been enhanced to allow command strings longer than 99 characters. The maximum command length is now 255 characters;
- The memory paged version of the SCOLR\$ routine has been modified to fix the various problems that occur when it is invoked;

The following changes to the Global Speedbase Development System have been implemented:

- The Speedbase Development System installation job, EDINS, now checks that Speedbase PM has been installed to prevent a variety of problems if the Speedbase Development System is installed on a non-PM configuration;
- \$SDE has been modified to operate in "text mode" when used with a Global Windows Workstation "GUI TAP" (e.g. \$.711);
- \$SDM has been modified to operate in "text mode" when used with a Global Windows Workstation "GUI TAP" (e.g. \$.711);
- \$SDL has been modified to prevent the OVERFLOW AT 231C when the source file contains more than 9,999 lines. Furthermore, \$SDL now recognises the \$\$GUI and \$\$SCNN System variables;
- Two new routines, B\$BAD and B\$RBG, are now available to regenerate a Speedbase database;

- A new status routine, B\$STB, is now available. B\$STB is functionally equivalent to the existing B\$STA but copes with C-ISAM, Btrieve and SQL databases that contains more than 999,999 records. The calling convention for B\$STB is the same as for B\$STA except the formats on the A1SIZE and A1FREE fields in the interface block have been increased from PIC 9(6) COMP to PIC 9(9) COMP. Furthermore, a new PIC 9(9) COMP field, S1USED, has been added to end of the S1 block to return the number of records currently used;
- A new routine (entry point B\$ETPS in module BA\$ETP) is available to allow the V8.1 Speedbase sub-routines to be cleanly linked with certain Cobol applications. This routine prevents the missing B\$ETPS global symbol error message that has been reported by some Cobol developers. This routine must be used to establish a COMMON SECTION at address #600. The BA\$ETP module must be linked at level A with the actual application linked at level B. For example:

```
GSM READY:$LINK
$44 LINK:<CTRL A>
$44 DEFINE INFORMATION OVERLAY AT LEVEL A
$44 LINK:#0600
$44 LINK:BA$ETP UNIT:210
$44 LINK:<CR>
$44 DEFINE INFORMATION OVERLAY AT LEVEL B
$44 LINK:MYPROG UNIT:211
$44 LINK:$BALIB UNIT:210
$44 LINK:<CR>
$44 PROGRAM:
```

- The B\$XCL routine has been modified to fix a STOP 25404 error that can occur when combinations of Global format and Btrieve format Speedbase databases are used on Global System Manager (Windows) AND Global System Manager (Novell);
- The B\$OPN routine has been modified to fix a (different) STOP 25404 error from B\$XCL (sic) that can occur on Btrieve format Speedbase databases on Global System Manager (Windows).

The following change to Global File Converters has been implemented:

- The File Converter for GSM (MS-DOS) and GSM (Novell); and the File Converter for GSM (Windows) have been enhanced to optionally round-up the size of an imported RS file to an integral number of records (i.e. if the file-size is not an exact multiple of the record size). The new option is enabled by terminating the reply to the Record Size prompt with <CTRL A> instead of the normal <CR>.

The following changes to Global Configurator have been implemented:

- The Global Configurator installation job, CFINS, no longer automatically scratches an existing CFPROG volume. The operator is now prompted to:

```
Re-initialise CFPROG on unit nnn? (N):
```

- The Global Configurator installation job, CFINS, allows the Global Configurator components to be installed on SYSRES.

2.8 Global System Manager V8.1 revision V8.1j

Global System Manager V8.1 revision V8.1j includes several new features and significant enhancements to Global System Manager V8.1 revision V8.1i.

Global System Manager V8.1j is the first revision of GSM V8.1 to include the 32-bit run-time environment. All programs developed using the 32-bit Development System will only operate on GSM V8.1j, or later. If any attempt is made to run a 32-bit application on GSM V8.1i or V8.1h the following error message will be displayed:

```
SORRY - YOU ARE ATTEMPTING TO USE A SERVICE WHICH IS NOT
PART OF YOUR GLOBAL SYSTEM MANAGER.
```

If any attempt is made to run a 32-bit application on GSM V8.1g, or earlier, a STOP CODE 101 will be reported.

The 32-bit Global Development System is also released with GSM V8.1j. Both the 32-bit Global Development System and the 32-bit run-time environment are fully described in Appendix F.

Furthermore, Global System Manager V8.1j is the first revision of GSM V8.1 to include support for Speedbase SQL Server. The Speedbase SQL Server option is fully described in Appendix E.

Important Note: No Production Versions of GSM V8.1j were released. GSM V8.1j was immediately superceded by GSM V8.1k (see section 2.9). However, all the points in this section (i.e. section 2.8) also apply to GSM V8.1k.

The following changes to 16-bit run-time Global System Manager have been implemented:

- The limit on the number of partitions per computer/system has been increased from 99 to 250. Note that this 99-partition limit is per SYSTEM. Much larger configurations are running with multiple systems in either true LAN (NT fat client) or pseudo-LAN (GSM (Unix) or NT SMC) configurations.

This enhancement is only available on GSM (Windows) and GSM (Unix) configurations. The Global Configurator section (below) describes how this new option is enabled. The changes that affect Global System Manager start-up and a large number of GSM and Speedbase utilities are self-contained and have all been incorporated into GSM V8.1j.

Unfortunately, a number of external sub-routines have also been affected and thus applications (both TIS Software applications and 3rd party applications) must be modified in order to operate correctly on a system configured with more than 99 partitions (i.e. a system with User Numbers higher than 99). Thus, we have invented another compliance standard against which applications, linked with those subroutines, must be judged. To be "more than 99 user" (M99) compliant an application must be re-linked with V8.1j, or later, if it contains any of the subroutines listed below.

If a non-M99 compliant application is run on a GSM system with more than 99 partitions it will behave perfectly normally for User Numbers 1 to 99 but will stop, typically with an unexpected PGM CHK 11, for

User Numbers between 100 to 250. Note that the exact behaviour for User Numbers 100 to 127 may be different from that for User Numbers 128 to 250.

Any application that includes the following sub-routines must be re-linked (and possibly recompiled) to be M99 compliant:

USER\$	Any application using USER\$ must be recompiled to include USERX\$ instead. The US block for USERX\$ is slightly different from the US block for USER\$ (see below).
OPID\$	Any application using OPID\$ must be recompiled to include OPIDX\$ instead. The US block for OPIDX\$ is slightly different from the US block for OPID\$ (see below).
JOB\$	Simple relink required
LOG\$	Simple relink required
PURGE\$	Simple relink required
LOAD\$	Simple relink required
SDATA\$	Simple relink required
LCUS\$	Simple relink required
UNLO\$	Simple relink required
UNLC\$	Simple relink required
ENTRY\$	Simple relink required
RESID\$	Simple relink required
AUTH\$	Simple relink required
GETX\$	Simple relink required
RELX\$	Simple relink required

Although the above list is quite daunting the subroutines listed above are very specialised and are highly unlikely to be used by most typical applications.

Applications should also be checked to ensure that they don't convert \$\$USER to a 2-digit number to create a user-specific object (e.g. when creating the name of a work-file).

There is further checking in Global System Manager start-up to remove users higher than 99 if the GSM nucleus does not support extended User Numbers. At the time of writing only the V2.8 GSM (Windows) nucleus supports extended User Numbers (see section 5.8). This change will be ported to the GSM(Unix) nucleus in due course but there are no plans to include this new functionality into GSM(BOS), GSM(DOS) or

16-bit GSM(Novell);

Important Note: At the time of writing no Global 2000 or Global 3000 modules are "M99 compliant". Global Business Systems have no plans to upgrade any 16-bit Global 2000 or 16-bit Global 3000 applications to become "M99 compliant". Please bear this restriction in mind when considering upgrading a site to more than 99 partitions per system.

- \$STATUS has been enhanced in several areas: The LSF command now prompts for a specific computer/system node-id. If the reply is <CTRL B> details of all the nodes on the network are displayed (as before).

If the CDE option has been used to create a Screen Description Table, the "LIS" and "LSF" commands display the Screen Index Number. This simple index number, rather than the User Number, may be required when running System Administrator tasks on Global System Manager (Windows) thin-client configurations.

If the reply to the User Number prompt issued by the RES, DIS and CAN commands is <CTRL C>, the Screen Index Number may be specified. This option may be useful when restarting users on Global System Manager (Windows) thin-client configurations.

The \$STATUS LOC command reports on locks on the local system (e.g. domain 200) if the option to report on the entire network has been specified by keying <CTRL B> to the computer-id/system-id prompt.

\$STATUS now displays the Terminal Code (i.e. TAP number) correctly on non-LAN configurations.

If the \$AUTH or \$PASSWD (see below) retry count has expired due to an invalid attempt to sign-on to GSM, \$STATUS reports the status of the locked screen as:

SIGN-ON RETRY EXCEEDED

When reporting on locked Global format Speedbase databases, \$STATUS defaults to the last Index File unit that was keyed when several "split" databases have outstanding locks. In this context a "split" database is one where the Index File (e.g. DBxxxxx) is on a different unit from the locked datafile (e.g. DBxxxxx1). This enhancement reduces the number of keystrokes required to obtain a full Lock status report on large configurations with several split Speedbase databases.

- A new, highly secure alternative to the \$AUTH Authorisation Program is now available. The new utility, \$PASSWD, includes the following improvements over \$AUTH:
 - The minimum number of characters in the password can be specified;
 - The maximum length of a password string has been increased from 8 to 20 characters;
 - All passwords are held in a one-way encrypted format;

- An option to force non-alphanumeric characters in the password string can be enabled;
- An option to force the password to expire after a number of days can be enabled;
- Prevents the re-use of an expired password;
- Logs all failed sign-in attempts for subsequent examination by a supervisor.

A utility, \$AUTHCNV, is available (on request) to convert the entries in a \$\$AUTH file into the files required by \$PASSWD;

- Menu Maintenance, MN, has been enhanced:
 - The problem that resulted in screen corruption when switching from a menu line type of "S" to "A" has been fixed;
 - The Amend Menu Line screen has been re-designed to make it appear less "cluttered". The various options are now accepted in a logical order. Furthermore, a number of dialogue problems in the "Amend" option have been fixed;
 - The confusing "logoff" and "logoff delay" options in Menu Maintenance have been rationalised. In the Menu Amendment screen the "Log off delay" prompt has been changed to "Sign off delay"; In the Menu File Parameters screen the "Logoff delay in use?" prompt has been replaced by "Sign-off delay in use"; and the "Allow logoff?" prompt has been replaced by "Menu option 'Allow log off' in use?";
 - The Menu File Parameters screen includes a 3-way option to control Event Logging; The "Event logging option" can be set to any one of:
 - 0 The event logging flag in each individual menu is recognised;
 - A The event logging flag in each individual menu is ignored and event logging always occurs;
 - N The event logging flag in each individual menu is ignored and event logging never occurs;
- The Menu Handler, \$MH, has been enhanced:
 - The correct menu line number is displayed when the <F4> customise option is selected;
 - The <F4> option functions correctly when the "Selected <CR> line?" option is set to "N";
 - The <F4> option is only allowed for operators with an Authorization Level of "Z";
 - A problem that caused the "Run in text mode" option to be reset immediately when running a type "S" menu line has been fixed.

- The \$SP “RE” (Reverse List) option is included in the Help List. Furthermore, the Help List is now sorted in alphabetical order of command;

The problem that caused a PARAM STACK ERROR AT FOC8 when printing with a Printer Format Letter customisation that includes an extension file, has been fixed;

- A problem in \$VOL that causes an OVERFLOW AT 866E, has been fixed. When \$VOL is used to produce a volume listing for a domain, the sub-volume number for each processed volume is included in the short form of the report;
- The descriptions for <SYSREQ>B and <SYSREQ>K in the drop-down menu displayed by <SYSREQ><SPACE> have been changed to “Key translation” and “Soft function keys”, respectively;
- <SYSREQ>D has been enhanced to return the current date in ISO-8601 format (i.e. as CCYY-MM-DD) when <CLEAR> is keyed to terminate the system request;
- The \$RECOVER utility has been moved from the Toolkit product to run-time Global System Manager;
- The name of the Hewlett Packard LaserJet-5 Printer Control File distributed with Global System Manager has been changed from \$PRSTA04 to \$\$PSTA04;
- A number of new Terminal Attribute Programs (TAP’s) are now available:

- \$.732 Equivalent of the Console mode TAP for use with GLCONS.EXE on Windows NT but with hash/pound translation;
- \$.734 Equivalent of the Console mode TAP for use with GLCONS.EXE on Windows NT (i.e. \$.730) but with the Wide Mode option removed;
- \$.751 Same as \$.711 except that all status line messages also appear in a Windows Dialogue box (providing the GLOBAL.EXE version is V2.8, or later);
- \$.754 Same as \$.714 except that all status line messages also appear in a Windows Dialogue box (providing the GLOBAL.EXE version is V2.8, or later);
- \$.811 8-bit equivalent of \$.711 (for use with foreign language character sets). Note that a Speedbase TAP for \$.811 (i.e. T>811) is also distributed with GSM V8.1j).

Furthermore, all TAP’s for use with the Global Windows Workstation (both “GUI” mode and “text” mode) now include the “GWW” option (see below);

- A problem in \$DLIB that causes a STOP 9501 at 607C when using the CHA option, has been fixed;

- A problem in \$MAIL that prevents the "Send Reply" option from working under some conditions, has been fixed;
- \$LOG has been enhanced to display a warning message if there is likely to be insufficient free space in the \$\$MLOG Main Log file to hold the contents of the \$\$LOG Working Log file. This message is displayed before automatically merging \$\$LOG into \$\$MLOG thus allowing \$\$MLOG to be purged to free up some space before attempting the merger. **Important note:** If this warning message appears you are strongly advised to purge entries from the \$\$MLOG file;
- A new Program Library format that allows up to 1000 members in an Extended Program Library has been implemented. A new librarian, \$LIBX, allows Extended Program Libraries with up to 1000 members to be created and maintained. \$LIBX does not recognise Compilation Libraries (i.e. C.xxxxxx), Nucleus Libraries (i.e. +.xxxxxx) or Bootstrap Libraries (i.e. #.xxxxxx).

Note that \$LIBX cannot be used to open a 100-entry Normal Program Library. Similarly, \$LIB cannot be used to open a 1000-entry Extended Program Library. In both cases the librarian will display a WRONG SIZE LIBRARY error. However, \$LIBX can be used to extract members from a 100-entry Normal Program Library into a 1000-entry Extended Program Library.

Important Note: The change to \$LIB to recognise a 1000-entry Extended Program Library and report a WRONG SIZE LIBRARY error has been implemented for GSM V8.1j. If a pre-V8.1j version of \$LIB is used to open a 1000-entry Extended Program Library it will (best case) result in apparent corruption when LIS'ting the library or (worse case) result in permanent library corruption if the END command is used. If a pre-V8.1j \$LIB is used inadvertently to open an Extended Program Library the librarian should be aborted immediately by keying <ESC> before any updates, leading to corruption, are made. Since the V8.1j \$LIB will be installed during a V8.1j upgrade installation no systems should ever contain both a V8.1j \$LIBX and a pre-V8.1j \$LIB (although care must be taken when upgrading networked systems).

The V8.1j Program/Overlay/Frame Loader has been upgraded to recognise Extended Program Libraries. Consequently, the members of Extended Program Libraries can only be used on GSM V8.1j systems. Furthermore, in order to access Extended Program Libraries, the Program Loader uses a technique that is only available with the 32-bit GSM run-time option. Thus, although \$LIBX is a pure 16-bit application that can be used on any GSM configuration, **the Program Loader can only load programs, overlays or frames from an Extended Program Library if the 32-bit GSM run-time option is enabled (see Appendix F for more details).**

- A problem in \$DEBUG that results in a MEMORY CALCULATION error message normally followed by a STOP 10201 and a computer crash, has been fixed. \$DEBUG now correctly establishes the Help File unit for the Help File;
- The problem in V8.1i \$CUSUPD that results in a PGM CHK 8 AT 279C has been fixed;

- \$CUS and GSM start-up have been enhanced to optionally suppress the default TAP. A reply of <CTRL C> to the \$CUS Sign-On Customisation/Terminal Type option enables this feature.

Furthermore, \$CUS has been enhanced to allow the Install Event Logging option to work correctly on GSM (Windows) configurations. \$CUS also checks that the \$BA unit assignment is available when appropriate;

- \$MNDISP has been enhanced to allow the customisations that are applied to the "current" \$MONITOR file to be applied to another "imported" \$MONITOR file. This advanced option should only be used by experienced System Administrators;
- The TAP load function of Global System Manager start-up for GSM (Windows) has been enhanced to check that the terminal type is appropriate for the Global Windows Workstation emulator. This checking, which is only enabled if the \$.711, \$.712 etc. TAP is V8.1j, or later, (i.e. if the "GWW" option is enabled in the TAP - see below) AND if the GLOBAL.EXE is V2.8, or later, AND if the CheckGWWFlag option is enabled in the Registry (see section 5.8), will result in the following message if the TAP is not appropriate for the terminal emulator;

INVALID TERMINAL TYPE (GUI)

In addition, Global System Manager start-up has been enhanced to send the operator-id to the Global Windows Workstation. Furthermore, the problem that results in an ILL JUMP error when <CR> is keyed to the "USER FILE HAS BEEN PURGED" message, has been fixed;

- A new customisation utility, \$CUSNET, is available to customise the name of the Authorisation Program (e.g. \$AUTH, or \$PASSWD) for ALL the computers on a network. This option avoids the requirement to run \$CUS on every PC in order to establish the network-wide Authorisation Program;
- A new utility, \$ABORT, is available to terminate a GSM session immediately. This potentially extremely dangerous utility is not released externally but is available upon request.

The following changes to Global System Manager installation have been implemented:

- The problem that causes the Date Format to be incorrectly set to "USA format" if the reply to the following prompt is <CR>:

[A.21] Key D to use DD/MM/YY date format
or M to use MM/DD/YY date format (D):

has been fixed;

- The problem that causes a "SYSIPL installation" to fail if the reply to the following prompt is NOT <CR>:

[A.44] Do you want to install the Global Reporter system routines?
(N):

has been fixed;

- A cosmetic problem with the following prompt:

[A.43] Do you want to install the Global 3000 V4.5 system routines? (N):

has been fixed;

- The various data files, \$\$PASS, \$\$OPASS and \$\$PLOG, required for the \$PASSWD utility (see above) are always installed. Furthermore, when performing a non-standard Installation the following prompt is displayed allowing \$PASSWD, rather than \$AUTH, to be used as the Authorisation utility:

[A.45] Do you want to use the standard authorisation program? (Y):

The following changes to Speedbase Presentation Manager and Speedbase utilities have been implemented:

- Due to short-term space restrictions on the 02A "EPA" diskette the 16-bit Speedbase demonstration programs (S.V3DEMO and P.V3DEMO) and database (DBDEMON, DIDEMON, DBDEMON1) are not distributed with GSM V8.1j;
- The Speedbase System (\$BASYS) is automatically unloaded from the User Stack when a "root" Speedbase Frame exits. This change prevents \$BASYS remaining loaded on the User Stack after a Speedbase application has been used;
- A problem that nullifies the effect of the "Disable Tab" option (i.e. <TAB> is enabled at all times) has been fixed;
- The \$BAST utility has been enhanced to display the status of Btrieve locks on a particular Database/Record set for Btrieve format Speedbase databases. This feature, which is enabled by keying <UF1> when the relevant record set in the required database is selected in the \$BAST "record Type display option, will be supplemented, for GSM (Novell) configurations, by a new option in the SPEEDBAS.NLM. This option requires the V1.60, or later, Speedbase NLM or Gateway.

The following changes to the Global Cobol Development System have been implemented:

- A new sub-routine, WOYR\$, is now available to convert a PIC 9(6) COMP date to a PIC (4) COMP Week Number (where the Week Number is defined in ISO-8601);
- Two new sub-routines, USERX\$ and OPIDX\$, are available as replacements for USER\$ and OPID\$, respectively, on systems that have been configured with more than 99 partitions per node-id. **Important note:** If a system has been configured with more than 99 partitions then every utility or application MUST be upgraded to replace any calls to OPID\$ by OPIDX\$; and any calls to USER\$ by USERX\$. The US block passed to USERX\$ and OPIDX\$ has the following format:

```

01      US
02      USOPID  PIC X(4)          * Same as for USER$, OPID$
02      USUNO  PIC 9(4) COMP    * PIC 9(2) COMP in US block for
USER$, OPID$

```

```

02      USSCNN    PIC 9(4) COMP * PIC 9(2) COMP in US block for
USER$, OPID$
02      USCID     PIC X          * Same as for USER$, OPID$
02      FILLER    PIC X(2)       * Same as for USER$, OPID$
02      USPART    PIC 9(2) COMP * Same as for USER$, OPID$

```

- A new sub-routine, ABORT\$, is available to terminate a GSM session immediately. This potentially dangerous routine is not released externally but is available upon request;
- A new sub-routine, LIBRX\$, is available. This sub-routine, which is related to LIBR\$ and LIBRA\$, allows the maximum number of copy-books allowed in the copy-library to be passed via the Commercial Code Accumulator. Note that LIBR\$ sets the maximum to 100; LIBRA\$ sets the maximum to 500;
- A new routine, MENX\$, is available. MENX\$ is identical to MENU\$ except that the menu line delimiter character is “|” rather than “.” thus allowing the “.” character to appear in the titles of menus displayed by MENX\$;
- A new sub-routine, NSCR\$, returns the number of screens and the total number of partitions. Both values are returned in PIC 9(4) COMP variables;
- The Remove Assignment option of the ASSIG\$ routine has been enhanced to ensure that an assignment is cleared from both the extra ASSIG\$ table(s) and the fixed, 29-entry table. This change fixes the “stale assignment” problem that can occur if a mixture of “old ASSIG\$” and “new ASSIG\$” calls are made on the same system;
- The change to the DMAM DBREK\$ routine introduced for GSM V8.1i (see section 2.7) introduced a problem: The V8.1i DBREK\$ DMAM sub-routine can return normally when a record does not exist. This secondary problem has been fixed in V8.1j. Note that this fix applies to the DMAM Access Method (AM\$A etc.) rather than the DBREK\$ sub-routine itself (OG\$A);
- A problem in the Screen Formatting sub-routine, SM\$A, that results in an ILL LOAD when keying <UP-ARROW> whilst updating a map, has been fixed;
- \$COBOL has been enhanced to recognise the \$\$GWW System Variable. Some of the escape sequences in Appendix M of the V2.3 Global Windows Workstation (GUI) Notes are appropriate when \$\$GWW is set; other are only appropriate when both \$GWW and \$\$GUI are set. The following combinations of \$\$GWW and \$\$GUI should be expected:

\$\$GWW	\$\$GUI	Comments
0	0 Windows	TAP that is not appropriate with the Global Workstation (e.g. \$.519, \$.163 or \$.707); or a pre-V8.1j version of a Global Windows Workstation “text” mode TAP (e.g. \$.716);
0 Windows	1	Pre-V8.1j version of a “GUI” mode Global Workstation “GUI” mode TAP (e.g. \$.711);

1 0 V8.1j, or later, version of a Global Windows
Workstation “text” mode TAP (e.g. \$.716). Some of the escape sequences described in Appendix M of the V2.3 GUI Notes may be appropriate when \$\$GWW is non-zero. Note that \$.712 was NOT designed for use with the Global Windows Workstation. However, it has become the de facto “text” mode TAP. Consequently, the \$\$GWW flag will be non-zero when running \$.712, or \$.730 etc.;

1 1 V8.1j, or later, version of a Global Windows
Workstation “GUI” mode TAP (e.g. \$.711). All of the escape sequences described in Appendix M of the V2.3 GUI Notes are appropriate when \$\$GUI is non-zero;

- The \$DEV “H” option has been improved to recognise that \$SDL only accepts up to 4 compilation libraries (e.g. C.\$MCOB) in the “LNK” option;
- \$FORM has been enhanced to allow maps to be upgraded from pre-V8.1 to V8.1, for example, using Job Management (earlier versions of \$FORM could not be used with Job Management). When running under Job Management, \$FORM automatically updates the map without entering the Edit Phase of the dialogue;
- The following obsolete utilities have been removed from the Toolkit product: \$SCFCALC, \$TRANS, \$TRMAIN, \$TRBACK;
- \$TAP recognises a new keyword “GWW” to indicate the TAP is for use with the Global Windows Workstation (GUI) in either “GUI” or “text” mode (see above). **Important note:** Do not confuse the “GUI” and “GWW” keywords:

GUI Indicates the TAP is for use with the Global Windows Workstation when operating in “GUI” mode;

GWW Indicates the TAP is for use with the Global Windows Workstation when operating in either “GUI” mode or “text” mode.

For example, “GUI” mode TAP \$.711 includes both the GUI and GWW options; “text” mode TAP \$.712 only includes the GWW option; PCWS TAP \$.707 includes neither option.

- \$TAP also recognises a new option “ANSI-7E” for use with GSM (Unix) ANSI terminals. This option changes the ANSI Keyboard algorithm in the Console Executive to include special processing for ANSI sequences that terminate with the 0x7E character;
- An improved Object Code Translation utility, PTRANX, is now available. Full details of PTRANX, which is based on PTRANS, are available upon request;
- The EXIT and STOP code databases, \$\$ERREX and \$\$ERRST, have been extensively revised to include several new EXIT and STOP codes.

The following changes to the (16-bit) Global Speedbase Development System have been implemented:

- \$SDL now allows a maximum of 200 copy-books per copy-library (the previous limit was 100 copy-books). \$SDL also recognises the \$\$GWW System Variable (see above);
- \$SDE has been modified to remove the copy library index (i.e. the index created by the \$COPLB utility) when editing a copy library. This allows the modified copy library to be used subsequently by \$COPLB, \$COBOL etc.;
- A new sub-routine, SBTYP\$, is available to determine the nature of a Speedbase database:

```
CALL SBTYP$ USING fd type
```

where fd is a closed FD containing the name and unit of the Speedbase database or Schema File; type is a PIC 9(4) COMP field into which the result is returned:

- 0 Global Speedbase database (all configurations)
- 1 C-ISAM format Speedbase database (GSM (Unix) only)
- 2 Btrieve format Speedbase database (GSM (Novell) or GSM (Windows))
- 3 SQL Server format Speedbase database (GSM (Windows) only)

The following changes to Global File Converters has been implemented:

- The “Multiple File Export mode” of the GSM (Windows) and GSM (DOS) File Converters (i.e. when E<CTRL B> is keyed to the Mode prompt) has been enhanced to allow <CTRL C> to be used to display the previous file when scanning a Global directory;
- A new “Multiple file export for \$BBS mode” has been added to the GSM (Windows) and GSM (DOS) File Converters. This mode is enabled by replying E<CTRL A> to the Mode prompt. In this mode, the conversion type is always “C” and the DOS/Windows file extension is always .GSM. This mode is intended for the batch conversion of Global files to the \$BBS file format;
- A problem in the Import Report file option that prevented zaps, in the form of DOS/Windows text files, from being converted back to valid Global zap files, has been fixed.

The following changes to Global Configurator have been implemented:

- The error message:

```
TOTAL NUMBER OF PARTITIONS MUST BE LESS THAN 100 (nn)
```

has been relaxed to a warning for GSM (Windows) and GSM (Unix) configurations.

Important note: If this warning is ignored when editing the configuration file the rules regarding the use of USER\$ and OPID\$ described above MUST be followed when the configuration file is used at GSM load-time.

The maximum values for the Screen Number and User Number now depend on the configuration:

	Max. User Number	Max. Screen Number
BOS	99	255
DOS	99	255
Novell	99	255
Windows NT	250	255
Unix	250	255

2.9 Global System Manager V8.1 revision V8.1k

Global System Manager V8.1 revision V8.1k includes several new features and significant enhancements to Global System Manager V8.1 revision V8.1j.

Global System Manager V8.1k is the first revision of GSM V8.1 to include the externally released 32-bit run-time environment and 32-bit Development System. All 32-bit programs developed using the V8.1k 32-bit Development System will only operate on GSM V8.1k, or later.

If any attempt is made to run a 32-bit application, developed using V8.1k, on GSM V8.1j (which also included the 32-bit run-time software) a STOP 116 will result accompanied by a RESOLVER ERROR message. This does not represent a problem because production versions of the GSM V8.1j run-time software were never released externally.

If any attempt is made to run a 32-bit application, developed using V8.1j (which also included the 32-bit Development System), on GSM V8.1k a STOP 116 will result accompanied by the following error message:

```
RESOLVER ERROR y Compiled with pre-V2.00 $SDL32
```

This does not represent a problem because production versions of the GSM V8.1j Development System were never released externally.

If any attempt is made to run a 32-bit application on GSM V8.1i or V8.1h the following error message will be displayed:

```
SORRY - YOU ARE ATTEMPTING TO USE A SERVICE WHICH IS NOT
PART OF YOUR GLOBAL SYSTEM MANAGER.
```

If any attempt is made to run a 32-bit application on GSM V8.1g, or earlier, a STOP CODE 101 will be reported.

The 32-bit Global Development System is also released with GSM V8.1k. Both the 32-bit Global Development System and the 32-bit run-time environment are fully described in Appendix F.

As with all previous revisions of GSM V8.1, there is 100% compatibility between V8.1k and earlier revisions for all 16-bit Speedbase and Cobol programs.

Furthermore, Global System Manager V8.1k is the first production revision of GSM V8.1 to include support for Speedbase SQL Server. Note that support for SQL Server was also included in the non-production GSM V8.1j (see section 2.8). The Speedbase SQL Server option is fully described in Appendix E.

Important Note: No production versions of GSM V8.1j were released (see section 2.8). GSM V8.1k immediately superceded GSM V8.1j. However, all the points in section 2.8, describing GSM V8.1j, also apply to GSM V8.1k.

The remainder of this section describes the changes between GSM V8.1j and GSM V8.1k.

The following changes to run-time Global System Manager have been implemented:

- The 32-bit run-time modules have been enhanced to run “32-bit Cobol” programs. See Appendix F for further details;
- A problem in the V8.1j \$LIBX librarian that results in an OVERFLOW AT 8A4C when the library size is larger than 8Mb, has been fixed. **Important Note:** The format of 1000-entry Extended Library produced by GSM V8.1j \$LIBX is incompatible with the library format produced by the V8.1k, and later \$LIBX. This should not represent a serious problem, as production versions of GSM V8.1j were never released externally.

The V8.1k Program Loader has been modified to recognise only the V8.1k format Extended Libraries;

- <SYSREQ> t has been upgrade to support User Numbers higher than 99 (i.e. all System Requests are now M99 compliant – see section 2.8);
- \$DIRP has been modified to fix a problem that can result with certain file types (e.g. type “SF”). The symptoms of the problem are displaying the SPARE SPACE as “***”, falsely indicating a password or failing with an OVERFLOW (e.g. OVERFLOW AT 3F82);
- A new option has been included in the \$CUS System Maintenance option to allow the “32-bit Service Licence” to be applied.

A new option has been included in the \$CUS Configuration Customisation option to automatically unload the 16-bit Speedbase Services when the last Speedbase frame in an application terminates. This option should only be enabled for certain 3rd party Speedbase applications. **DO NOT ENABLE THIS OPTION IF GLOBAL 3000 IS BEING USED;**

The error messages displayed by the Price Level Upgrade option of \$CUS/System Maintenance have been rationalized to include an error code;

- \$INSPECT now displays a meaningful message if the absence of the \$WK assignment results in the “Insufficient Space to Inspect Further” error condition. \$INSPECT also validates the argument to the \$LS command (in earlier versions a \$LS value of 0 would result in an ILL LOAD);
- \$STATUS has been modified to fix the problem that can result a NUM CONV AT AA88;
- \$VOL now correctly describes DMAM files as “DMAM DB” rather than just type “06”. \$VOL also recognises 32-bit program files and 1000-entry Extended Libraries;
- \$LOG now displays a warning message to allow an immediate purge if the estimated free space in the \$\$MLOG file is less than 50%;
- A problem in \$COMPRES that can result in a spurious “WRITE FAIL” error message under certain pathological conditions, has been fixed;
- A new librarian selector utility, \$LIBS, has been provided which chains to the appropriate librarian (i.e. \$LIB, \$LIBX or \$DLIB) according to the type of library specified. Note that \$LIBS can only

handle existing libraries – the appropriate librarian must be used to create a new library of the required format;

- A new utility, \$PAGES, has been provided to display the 32-bit memory page usage;
- A bug in V8.1j \$SP that results in an OVERFLOW (at various addresses) has been fixed;
- \$PASSWD has been enhanced to allow an operator-specific Password Expiry Period to override the system-wide Password Expiry Period. In addition, \$PASSWD has been slightly restructured to prevent problems during installation;
- A problem in the V8.1j start-up components that result in an OVERFLOW AT 55C4 when running \$E if the \$USER file is larger than 1Mb, has been fixed;
- The Printer Handler now dynamically detects Floating Auxiliary Printers and Pooled Printers and modifies the name of the expected Printer Control File correctly. This change alleviates the need to apply tailoring zaps to the P.\$MON if either of these specialised printer interfaces are being used;
- A dialogue difference between the V6.2 and V8.1 (all revisions) DBMAIN has been corrected. When selecting an existing record set to amend the V6.2 DBMAIN prompts for the Allocation Extent Size. This prompt is missing from all revisions of DBMAIN up to, and including, V8.1j. This prompt has been re-instated in the V8.1k DBMAIN.
- A small optimisation in the Program Loader has been removed to always restart the program library search from the 0'th library, regardless of the "current library", if the current library has a numeric suffix. The original code would always start the numeric library search from the "current library". For example, if a frame that has been loaded from library P.MYLIB1 EXEC's a frame in library P.MYLIB0 there is no longer any need to explicitly set \$\$PGM to P.MYLIB0. This change fixes the spurious PROGRAM xxxxxxxx REQUIRED ON messages that may appear in applications that are distributed randomly within several numeric program libraries. Note that the original optimization was intended only for distributed command libraries that have been carefully structured to ensure that lower-level overlays are always in higher-numbered libraries (e.g. an overlay in P.\$CMLB2 will never attempt to load another overlay in P.\$CMLB0);
- The processing of the RUN verbs has been modified to fix an obscure problem that can occur if the Display Buffer is full while the RUN verb is being executed;
- 8-bit versions of the 7-bit \$.712 and \$.716 have been released. These new TAP's, \$.812 and \$.816, respectively, allow the Global Windows Workstation and Global System Manager (Windows) to be used with foreign character sets. The equivalent Speedbase TAP's (i.e. T>812 and T>816) are also distributed with GSM V8.1k.

Furthermore, all the Global Windows Workstation, and related TAP's, have been modified to include extra START SEQUENCES to improve the validation at TAP load time. Please refer to the Global System Manager (Windows) Configuration Notes (C5660/19) for further details.

The following changes to Global System Manager installation have been implemented:

- The \$\$D unit assignment (see Appendix F) is correctly set to A01 (i.e. rather than 201) for Global System Manager (Windows) installations that don't include a local SYSRES;
- A problem in the dialogue for a non-standard installation has been corrected. The [A.45] message that prompts for a Standard or Non-Standard Authorization program always appeared even if an Authorization program has not been requested. This problem has been corrected.

The following changes to Speedbase Presentation Manager and Speedbase utilities have been implemented:

- Due to short-term space restrictions on the 02A "EPA" diskette the 16-bit Speedbase demonstration programs (S.V3DEMO and P.V3DEMO) and database (DBDEMON, DIDEMON, DBDEMON1) are not distributed with GSM V8.1k;
- The Speedbase System component (\$BASYS) now sets a flag to indicate that 16-bit Speedbase is being used. This flag is used to optionally unload Speedbase from the User Stack when a "root" Speedbase Frame exits. If this option is selected (see above) \$BASYS will not remain loaded on the User Stack after a Speedbase application has been used;
- The \$BAST utility has been enhanced to work correctly with \$.711 etc. on the Global Windows Workstation.

The following changes to the 16-bit Global Cobol Development System have been implemented:

- The Speedbase Access Method for Btrieve (SPAM) has been modified to allow access to a Btrieve format Speedbase database that is also being accessed by a Speedbase application. Before this change, such simultaneous Speedbase and SPAM access would result in a variety of problems. **IF THIS VERSION OF SPAM IS BEING USED THE VERSION OF THE SPEEDBASE NLM OR GATEWAY MUST BE V1.64, OR LATER, OTHERWISE AN ERROR 249 (INVALID SUB-OPCODE) WILL OCCUR;**
- A new subroutine, RENAX\$, is available to simply rename a native o/s file. Note that the calling convention for RENAX\$ is slightly different from the related RENAT\$:


```
CALL RENAT$ USING fd new_file_name
CALL RENAX$ USING old_file_name new_file_name
```
- A problem in the MSORT\$ sub-routine that causes a NO BASE exception if a Sort workfile is not specified, has been fixed;
- A problem in V8.1j \$JOB that causes executed jobs to cause random memory corruption on 32-bit GSM configurations has been fixed. **Important Note:** This should not represent a serious problem as production versions of GSM V8.1j were never released externally

- A problem in the \$ERLIST utility that results in a STOP 8104 when Next Page is selected when on the last page of a Error/Stop Code list, has been fixed;
- The Error and Stop Code databases (\$\$ERREX and \$\$ERRST) have been considerably revised.

The following changes to the 16-bit Global Speedbase Development System have been implemented:

- \$SDE has been modified to increase the size of the work buffers from 64Kb to 256Kb;
- The size of the B\$PPF routine (C.BA\$PPF) has been reduced considerably;
- A problem in the B\$STB routine (C.BA\$STB) has been fixed. The number of free records is now correctly returned for Global format and C-ISAM format Speedbase databases.

A large number of changes and enhancements have been made to the GSM V8.1j 32-bit run time and Development System. These changes are beyond the scope of these notes. However, all the new features of the V8.1k 32-bit Development System are fully documented in Appendix F. Note that the 32-bit Development System installation utility, UAINS, will only install on a GSM-PM configuration.

Important Note: The 32-bit compiler, \$SDL32, includes a 32-bit component and will only operate if the V8.1k 32-bit run-time option is available.

The following change to Global File Converters has been implemented:

- The “List Directory” function of the GSM (Windows) File Converter has been modified to handle an error reported by the SVC-61 “Find Next” operation. The File Converter no longer aborts the directory listing when an unexpected or unusual Windows file is encountered.

No changes to Global Configurator have been implemented for GSM V8.1 revision V8.1k. However, astute installers will observe that the CFA volume now contains several run-time Global System Manager components.

Important Note: The CFA volume is required for the installation of both Global Configurator and **run-time (non-PM) Global System Manager**.

2.9.1 Global System Manager V8.1 revision V8.1k (2nd release)

During Sept-1999 some components of GSM V8.1k were repackaged with a packaging date of 02/06/1999. The revised software includes the following modifications:

- The 32-bit compiler, \$SDL32, has been enhanced in several areas. The “\$SDL32 version” now included with GSM V8.1k is V2.11. This version of \$SDL32 supports very large symbol tables (i.e. much larger than the previous 2Kb limit) and is significantly faster than previous versions;
- All the 32-bit DLM's in P.\$SDLMO have been recompiled using the V2.11 \$SDL32. A number of minor problems with the 32-bit DLM's have also been fixed by this release;

- All the 32-bit utilities and assist files (e.g. \$BA32, \$MH32) have been recompiled using the V2.11 \$SDL32;
- The 32-bit loader has been modified to allow 16-bit applications to EXEC 32-bit applications;
- The \$PAGES utility has been modified to display addition information regarding the 32-bit memory allocation;
- A problem with the Debug System that resulted in several odd symptoms has been fixed. One symptom of this problem is that a reply of "Y" to the \$91 BREAK? message returns control directly to the main menu;
- A number of minor problems in GSM installation have been fixed: The \$\$D unit is now correctly assigned on GSM (Windows) and GSM (Unix) configurations. The problem that results in the following spurious message during the installation of GSM-PM (BOS), GSM-PM (DOS) or GSM-PM (Novell), has been fixed:

```
PROGRAM SETEP IN P.INS3 REQUIRED ON ...
```

- \$STATUS now supports the CLR command. This new command will automatically REStart all thin-client connections that have disconnected unexpectedly (e.g. if an operator has used the Close Button to close down a thin-client session without using \$E). This command is only supported on GSM (Windows) if the BACNAT software revision is V2.9A, or later (see section 5.9);
- The C-ISAM format Speedbase database utility, \$BADB, has been enhanced to handle records with more than 197 (approx.) fields;
- The DBMAIN utility, and P.DM library, are now distributed on, although not installed from, the CF volume;
- The \$CUSUPD utility and \$\$UPDATE control file have been modified to upgrade non-PM configurations correctly. Please refer to Important Note 9 in Appendix B regarding the use of V8.1k \$CUSUPD to upgrade an installed pre-V8.1k GSM to V8.1k. Furthermore, when using \$CUSUPD to upgrade a non-PM GSM to V8.1k, in addition to being prompted to increase the sizes of P.\$CMLB0, P.\$CMLB1 and P.\$DEB you will be prompted to create the following libraries:

```
P.$SDLMO 490Kb
P.$CMLB2 260Kb
```

Just swap to another partition and use \$LIB to create 2 empty libraries of the required sizes. Finally, once the upgrade has completed, you will be required to assign the \$\$D logical assignment to the SYSRES unit;

- The 32-bit Menu Maintenance utility, \$MN32, and its various overlays have been withdrawn from the EPA distribution volume. These files are distributed on, although not automatically installed from, the P.\$CMLB2 library on the CF distribution volume.

2.9.2 Global System Manager V8.1 revision V8.1k (3rd release)

During Oct-1999 some components of GSM V8.1k were repackaged with a

packaging date of 20/10/1999 (sic). The revised software includes the following modifications:

- The EPINS installation overlay has been re-released to fix a problem that produces a spurious JOB MANAGEMENT TERMINATED error when the reply to the following prompt is "N":

[A.38] Is this a Global System Manager PM system? (Y):N

2.10 Global System Manager V8.1 revision V8.11

Global System Manager V8.1 revision V8.11 includes several new features and significant enhancements to Global System Manager V8.1 revision V8.1k.

The following changes to run-time Global System Manager have been implemented:

- The contents of the P.\$CMLB0, P.\$CMLB1 and P.\$CMLB2 Command Libraries have been rationalised to move all the stub entries to P.\$CMLB3 and P.\$CMLB4. For revisions of GSM prior to GSM V8.11, the Command Libraries were allocated as follows:

Command Library contents	Pre GSM V8.11 contents	GSM	V8.11
P.\$CMLB0 components	GSM run-time components	GSM	run-time
P.\$CMLB1 components	GSM run-time components and stubs to SYSKIT/SYSDEV	GSM only	run-time
P.\$CMLB2	PM run-time components and stubs to SYSSBD	PM run-time components only	
P.\$CMLB3 stubs	Reserved for future use	Reserved	for extra
P.\$CMLB4 SYSDEV and	Reserved for future use	Stubs to	SYSKIT, and SYSSBD
P.\$CMLB5 run-time	Reserved for future use	Reserved	for GSM
P.\$CMLB6 run-time	Reserved for future use	Reserved	for GSM
P.\$CMLB7 run-time	Reserved for future use	Reserved	for GSM
P.\$CMLB8 run-time	Reserved for future use	Reserved	for GSM
P.\$CMLB9 run-time	Reserved for future use	Reserved	for GSM

This restructure (and the change to \$STARB described below) allows GSM (non-PM) V8.11, and later, to be upgraded by merely copying new versions of P.\$CMLB0 and P.\$CMLB1 (and eventually P.\$CMLB5 etc.) to SYSRES without the loss of stubs to Development System components; and allows GSM-PM V8.11, and later, to be upgraded by merely copying new versions of P.\$CMLB0, P.\$CMLB1 and P.\$CMLB2 (and eventually P.\$CMLB5 etc.) to SYSRES without the loss of stubs to Development System components. A complete technical description can be found in a White Paper on the Technology section of the Global web-site (see www.global3000.com/varworld/technolo/whitepap.html);

The Command Program Loader now searches from P.\$CMLB0 to P.\$CMLB4 when loading command programs (under previous revisions of GSM, the loader would stop after searching library P.\$CMLB2);

- The \$STARB Customisation overlay has been moved from inside the P.\$CMLB0 library and now exists as a stand-alone file on SYSRES. The \$STARB file is updated by some of the \$CUS options. The GSM V8.11 P.\$CMLB0 library is unserialised and does not contain any files that are customised at either installation time or at run-time. Thus, new versions of P.\$CMLB0 can be directly copied over an existing version of this library;
- A major change to the GSM start-up processing has been implemented to automatically reset the System Date and time in all partitions after \$E (or \$END) has been run. This change fixes the problem that can occur if \$D has been used to change the System Date in P1 and \$E (or \$END) is subsequently used to terminate the session. Under most circumstances the next user with that User Number will inherit the modified System Date on some partitions so that (normally) the System Date in P1 will be different from the System Date in the other partitions for that user. This unexpected, inconsistent System Date in different partitions has caused confusion at several sites. Although the change is not optional it is highly unlikely that any site relies on the \$E processing working in the inconsistent pre-V8.11 manner. This enhancement only applies to GSM (Windows) and GSM (Unix) configurations;
- The arbitrary 6 second delay between initialising partitions P2, P3, P4 etc. has been removed;
- A new utility, \$VOLMAIN, is now available to define one, or more, sub-volume chains. Chained sub-volumes are treated as a single program unit by the loader and for certain types of file open operations. For example, if units A10, A11, A12 and B13 are "chained" then an attempt to run a program with \$P set to A10, will automatically attempt to load the required program from A10, A11, A12 and B13 (in that order). This facility allows distributed program configurations without any of the restrictions imposed by distributed libraries (i.e. 10 libraries each with 100 members).

There is no limit to the number of sub-volumes that can be linked together. \$VOLMAIN allows a sub-volume chain to be built by allowing the "next" sub-volume in the chain to be defined. When exiting \$VOLMAIN an option to force an immediate update of the chained sub-volume table is available (the chained sub-volume table is automatically constructed when the Global client is loaded). The table of chained sub-volumes is held in the system file \$\$VOL on \$M;

- \$S has been enhanced to display either the PM Expiry Date or the 32-bit Service Licence Expiry Date (depending on the system configuration). Furthermore, on GSM (Windows) configurations, \$S also displays the fixed amount of memory allocated by the Global Client for use by 16-bit applications; and the variable amount of memory currently allocated by the Global Client for 32-bit applications. Note that further details of 32-bit memory usage are provided by the \$PAGES utility;
- The new \$STATUS "CLR" command clears all the thin-client connections that been disconnected unexpectedly (i.e. without running \$E). The


```

Global System Manager
Window Edit Functions Options Help
Global System Manager

$47 TASK CONTROL:LOC
Computer-id, <CTRL B> for all, <CTRL A> for unit (CA):
Key C to filter by computer, O to filter by Operator, <CR> for all:

LOCKED FILES ON COMPUTER CA
LKWORK UNIT 201 SHARED LOCK, LOCKED #00000000 2 TIMES
  1 LK block(s) in use, 100 LK blocks configured
$47 TASK CONTROL:LKE
Computer-id, <CTRL B> for all, <CTRL A> for unit (CA):
Key C to filter by computer, O to filter by Operator, <CR> for all:

LOCKED FILES ON COMPUTER CA
LKWORK UNIT 201 SHARED LOCK, LOCKED #00000000 2 TIMES
  User 3 Computer CA Operator ALAN/3 User 2 Computer CA Operator ALAN/2
  1 LK block(s) in use, 100 LK blocks configured
$47 TASK CONTROL:
Partition 1 Computer CA
CAPS

```

The \$STATUS "TER" command and \$BYE now write messages to the System Log File if the Event Logging option has been enabled. **Important Note:** The user number associated with these Terminate Messages will be unreliable;

- The functionality of the Calculator (i.e. <SYSREQ> C) "reduce to N Decimal places" command (i.e. "D") has been change to Round the result rather than Truncate the result. The old functionality of the "D" command is now available in the new "E" command. An example that reduces a number to 2 decimal places should make this clear:

	Original value	Result of D2	Result of E2
V81.k etc.	123.458	123.45	Invalid command
V8.11	123.458	123.46	123.45

- The TAP load processing has been enhanced to allow the default Terminal Type to be over-riden. This may be required for support purposes when the screen or emulator being used is not appropriate for the default Terminal Type, and it is not convenient, or possible, to re-customise the Global-client host-end of a thin-client connection (i.e. the override option can be specified remotely on a thin-client PC). This option will typically be used to over-ride the default TAP that has been established using \$CUS.

Two changes have been implemented. Firstly, a default Terminal Type established at the "nucleus level" (e.g. in the GSM (Windows) registry, the GSM (Unix) Systems file or the GSM (Novell) INI file) now overrides a default TAP supplied from a \$CUS customisation (e.g. either the \$CUS "fixed" Terminal Type, or the last Terminal Type used by the operator). Secondly, both the "nucleus level" default Terminal Type and/or the \$CUS Terminal Type can be overridden with a user supplied Terminal Type. This is enabled by the special (invalid) reply of <SPACE><CR> to the OPERATOR-ID prompt. When the

correct (valid) Operator-ID has been supplied the TERMINAL TYPE prompt will be issued;

- The problem that caused the OPERATOR-ID prompt to be avoided under some conditions has been fixed. The problem only occurs if \$CUS has been used to customise the Terminal Type and if <ESC> is keyed to the OPERATOR-ID prompt. Note that some Global Windows Workstation options automatically send an <ESC> character to the host which exacerbates this problem;
- The name of the main Terminal Attribute Program (TAP) library on SYSRES has been changed from P.\$TAP to P.\$TAP\$0. This change should not affect any application software;
- The following new TAP's are available:

```

$.735      Equivalent of $.734 with hash/pound translation
$.830      8-bit equivalent of $.730
T>830      Speedbase TAP for $.830
$.814      8-bit equivalent of $.714. The Status-line appears in
            message box; also Down
            Arrow generates #19 (i.e. ^Y) rather than #1A (i.e.
            ^Z);
$.911      Special TAP for Global Application Explorer (GX)
T>911      Speedbase TAP for Global Application Explorer (GX)

```

Furthermore, TAP's \$.812 and \$.816 have both been revised to allow the display of 8-bit ISO-8859 compliant characters;

- The following TAP's have been modified to include the new "GSMCONS" keyword:

```

$.730      $.731      $.732      $.733      $.734      $.735

```

The net effect of this change is to set the \$\$GWW System Variable to 2 (i.e. rather than 1) for the TAP's that are for use with GSMCONS.EXE and GLCONS.EXE:

Example TAP	\$\$GX	\$\$GUI	\$\$GWW
GX (e.g. \$.911)	1	1	1
GUI (e.g. \$.711)	0	1	1
Text (e.g. \$.712)	0	0	1
Console (e.g. \$.730)	0	0	2
Dumb (e.g. \$.167)	0	0	0

- \$LIB has been enhanced to include the Refresh library, REF, command. This command is similar to the COP command but will only copy in files that already exist as members in the target library;
- \$PRINT no longer attempts to open the temporary file D.\$PRINT if the output device is a "printer" (i.e. a unit in the range 500 - 599). This prevents the creation of the empty, spurious Windows file DPRINT.nnn when the "printer" is a DOSPrint device;
- A new utility in the spooler suite, \$SPV, has been implemented. \$SPV only allows spool viewing but does so in a manner that avoids the lock on the \$\$SP file. Thus, \$SPV can be used to inspect files on the spooler without affecting another operator using \$SPOOL;

- The spooler has been enhanced to include an option to keep each file after printing (the default is to delete each file after printing). A new prompt in the "HO" option dialogue now appears:

Keep all files after they are printed (N)?

Set this option to Y to enable the new feature.

- The \$F BAC command now correctly copies a file-name set to SPACES (i.e. rather than aborting the back-up operation);
- The Menu Handler <F4> customisation option is now disabled when the Menu Handler has been called from an application. This prevents a problem when the <F4> exception is returned to applications that do not expect a value of 4.

The Menu Handler has been modified to always switch the "GUI Text Mode off" escape sequence before displaying any menu. This change is to ensure the menu is always displayed in "GUI mode" if an application line has temporarily switched the GUI into "Text Mode". This change only affects the menu when running with a GUI TAP (e.g. \$.711).

A problem in the Menu Handler that could result in PROGRAM NOT FOUND error messages including a spurious unit number (e.g. 201) in the library name, has been fixed.

The Menu Handler has been enhanced to use the optional Initial Menu established by \$PASSWD.

The problem in an internal release of the 16-bit Menu Handler, \$MH, that resulted in the spurious message "PROGRAM Na REQUIRED" has been fixed. Other problems in various internal release versions of the Menu Handler, that result in spurious TRAP's, and ILLEGAL LOAD and ILLEGAL QUAL exceptions, have been fixed.

- A 32-bit version of the standard 16-bit Menu Handler (\$MH) is now available **FOR EVALUATION PURPOSES ONLY**. The 32-bit Menu Handler, \$MENU32, is still under development and will be formally released in the next revision of GSM;
- The problem in Menu Maintenance, MN, that results in an ILL LOAD AT 6834 when establishing an Access Right, has been fixed. A further problem Menu Maintenance that results in a STOP 21601 when printing large menu files, has also been fixed;
- A specialised utility, MN32M, is available to automatically convert all the "F" (Frame) and "E" (Extended Frame) type menu lines in the menu file to switch on the "Run in 32-bit mode" flag. This utility is useful when converting a menu structure from running a suite of 16-bit Speedbase applications to an equivalent suite of 32-bit applications;
- \$CUS has been enhanced to provide a new option that is recognised by the program loader to close the program library after every program or overlay load. **Important note:** This new option, though useful in some circumstances, can severely degrade system performance.

Furthermore, \$CUS has been modified to remove the 198 LK-block (Lock Table) limitation for GSM (Windows) configurations. A problem in \$CUS that resulted in an OVERFLOW at OA7C in \$CUEMJ when attempting to allocate a Work Unit of 100Mb, or larger, has been fixed. Another problem in \$CUS that caused the details of the PM Expiry Date to be suppressed, has also been fixed;

The limit on the number of characters translated by the Printer Translation mechanism has been increased from 32 to 64. The Printer Translation File customisation overlay, \$CUSP, has been enhanced to allow up to 64 translations to be defined;

- The \$BBS utility has been enhanced to allow multiple-file Import and Export operations. This option is only available for GSM (Windows) configurations. To export multiple files from a Global directory terminate the "E" option with <CTRL B>. For example:

```
Key List, Export, Import, <ESC> to exit:E^B
Global template file :S.*   Global unit:210
Specify Windows directory
:D:\TEMP\
Export S.$BADN ?:Y   D:\TEMP\S_$BADN.GSM Copied
Export S.$BADNA?:Y  D:\TEMP\S_$BADNA.GSM Copied
Export S.$BADNC?:Y  D:\TEMP\S_$BADNC.GSM Copied
Export S.$BADND?:Y  D:\TEMP\S_$BADND.GSM Copied
```

For Global files, the default single-character wildcard character (i.e. "?") and the default multiple-character wildcard character (i.e. "*") can be changed using the new "W" option.

The illegal character checking in \$BBS has been tightened to remove the illegal ">" character from Windows files. Empty files are ignored when importing. A problem has been fixed that caused spurious PLEASE MOUNT messages under some conditions.

A problem in \$BBS when used on GSM (Unix) configurations has been fixed. The problem, which results in the corruption of imported files, only affects the \$BBS Import mode on GSM (Unix) if the non-Global file (e.g. EXAMPLE.GSM) has been created on a GSM (Windows), GSM (Novell) or GSM (MS-DOS) configuration. The problem is caused by pre-V8.11 versions of \$BBS only expecting the <LF> character in the GSM file imported on GSM (Unix) configurations. If the file has been created on GSM (Windows) etc. it will contain both <LF> and <CR> characters. If such a file is transferred from a Windows environment to a Unix environment by a process that does not involve replacing the <CR><LF> character combinations by a single <LF>, the pre-V8.11 \$BBS will not report an error but the Global file will be corrupted. The V8.11 \$BBS is more tolerant when running on GSM (Unix) configurations.

\$BBS now correctly executes a Windows "Close List" operation if "N" is keyed to the "Next Page?" prompt when listing a Windows directory;

- The GSM start-up code has been enhanced to detect a faulty generation (i.e. a system with an incorrectly applied PM password). Before the release of GSM V8.11 a faulty generation would result in a variety of obscure Licence Infringement messages at run-time. The error is now trapped and will result in the following unique message at start-up:

\$57 INITIATION WARNING 333 - NO EXPIRY DATE PASSWORD

This software has been incorrectly generated.

Please contact the Global Hotline on 020-7404-3196 to obtain a temporary password.

- The TIS Software phone number within the GSM Contact Protection Message has been changed to the Emergency Hotline Number: 020-7404-3196;
- A problem that occasionally caused a spurious NO BASE AT F314 during GSM start-up has been fixed;
- The problem that sometimes produces an EXIT WITH 1 when <ESC> is keyed to the TERMINAL TYPE prompt, has been fixed;
- \$END now sends the Global Windows Workstation a special "\$END escape sequence" (i.e. rather than the generic "\$E escape sequence"). The \$END escape sequence causes the Global Windows Workstation to clean up the session but it does not close itself down, if the ExitOn\$E option is enabled;
- The Log-Off processing that is triggered when an attempt is made to sign-on with an invalid password now runs \$E rather than \$END. This avoids the automatic closure of the Global Windows Workstation (see above);
- Keying <ESC> to terminate the SYSREQ I system request now correctly terminates the Global Windows Workstation System Request window;
- The debugger has been modified to display a specific "ILLEGAL PAGE" exception rather than the generic "ILLEGAL JUMP" exception when an attempt is made to call a non-existent Memory Page;
- A problem in the debug overlay has been fixed. The problem occurs after keying ^W to break an executing program. A reply of Y to the BREAK? prompt followed by a R (to resume) does not resume the executing program. Furthermore, after the problem has occurred, keying Y to the BREAK? prompt fails to invoke the 16-bit debugger;
- The \$MNDISP utility has been enhanced to allow the \$MONITOR customisation options to be written to the registry on GSM (Windows) configurations (see Appendix H). This allows the "Monitor" section of the registry (see section 5.9) to be updated automatically. Furthermore, \$MNDISP displays a warning message if the GSM (Windows) Monitor\ \$MONITOROverride registry option is enabled;
- \$USAGE has been enhanced considerably to include a detailed Introductory Screen. The <CTRL C> option to select a local File Executive is now part of the Node-id prompt. The column headings in the display now describe the Global Configurator and \$CUS prompts that can be used to alter the corresponding control block allocation.

The initial screen displayed by \$USAGE has been redesigned to remove some cosmetic problems and provide a better description of the functionality of the utility. \$USAGE also displays details of the

Extended Lock Table. To display the (normal) Lock Table and the Extended Lock Table reply Y to the following prompt:

Display Lock Table information only

A reply of N to this prompt will cause \$USAGE to display the File Channel, File Block and (standard) Lock Table information;

- The \$CDUPD job initiator (and \$CDUMJ meta-job) are now available to re-arrange a pre-V8.11 SYSRES to V8.11 standards. A complete technical description can be found in a White Paper on the Technology section of the Global web-site (see www.global3000.com/varworld/technolo/whitepap.html);
- The normal Printer Control File naming algorithm can be over-ridden on GSM (Windows) configurations by the CentralPCFName option (see section 5.13). If this option is enabled then the name of the Printer Control File always excludes the Node-id even for printer units in the range 500 to 549. See section 5.13 for full details;
- The \$PAGES utility, which displays the “in use” 32-bit pages, has been enhanced to report on:

The current number of 32-bit pages in use;

The highest number of pages that have ever been in-use (i.e. the high-water mark);

The “rotating” highest page number.

A reply of <CTRL A> to the User Number prompt redisplay these basic Page Statistics.

\$PAGES also displays the overall system-wide page allocation (in addition to the page allocation for a particular partition); includes an option to print the Page Tables; and now displays the Speedbase Environment Level Number in addition to the User Number;

- \$PASSWD has been enhanced to allow the Initial Menu file and unit to be specified. By using this option the Initial Menu is no longer restricted to \$\$MENUS on SYSRES.

Important Note-1: The option to specify the Initial Menu file is only available on GSM (Windows).

Important Note-2: The option to specify the Initial Menu file will only function correctly if the following registry setting is set to a value of at least 16:

..\Global\Client\Nucleus\ExtendedSystemAreaSize

If the above registry setting is absent, or is set to a value less than 16, the default menu (i.e. \$\$MENUS on \$CP) will be used regardless of the Initial Menu file setting in \$PASSWD.

In addition, \$PASSWD has also been enhanced to allow up to 4 “user specific” Unit Assignments to be configured. These extra unit assignments, which are established for all partitions for the user, are not permanent and will be removed if the Permanent Unit Assignment Table is purged (unlike the Permanent Unit assignments made by \$CUS).

A problem that caused \$PASSWD occasionally to terminate with a MEMORY VIOLATION if the maximum number of sign-on attempts is exceeded, has been fixed;

- A 32-bit version of \$PASSWD (i.e. \$PASS32) is available for evaluation;
- A number of minor problems in the \$LNAT utility have been fixed. \$LNAT now separates records with a blank line. \$LNAT has been improved to display the Record Number for each record displayed. Also a problem that caused spurious characters to appear on the far right of the display, has been fixed;
- A number of minor problems in the \$ZAPNAT utility have been fixed. \$ZAPNAT no longer suffers a PARAM STACK exception if an attempt is made to extract the zap directly from a zap file. \$ZAPNAT no longer displays spurious PLEASE ASSIGN prompts;
- A minor problem in the \$PATNAT utility has been fixed. \$PATNAT now allows the file pathname to be field-edited.
- A problem with the \$MAIL "Print Telephone Message" option that causes the start of the message to overprint multiple lines, has been fixed;
- A modification to the GSM run-time has been implemented to support a minor change to the BASEL\$ routine (see below);
- The program loader now recognises the entries in the FileNameMapping section of the GSM (Windows) registry (see section 5.13). It is now possible, for example, to map a program-name of \$I to \$INSPECT; and \$SDL to \$SDL32.

The following changes to Global System Manager installation have been implemented:

- The name of the TAP library created during installation has been changed from P.\$TAP to P.\$TAPSO;
- The Restore Customisation overlay, \$CUSRES, allows for the \$STARB file on the BACSAV volume (that has been copied from the original SYSRES) to be either inside or outside the P.\$CMLB0 library. Thus, the Save/Restore Customisation option during GSM V8.11 installation will function correctly with pre-installed external versions of GSM, and those internal versions that were released between GSM V8.1k and GSM V8.11;
- The Restore Customisation overlay, \$CUSRES, now restores the Linked Sub-volume index file, \$\$VOL;
- A reply of <ESC> to either of the following prompts no longer terminates the installation process:

[A.43] Do you want to install the Global 3000 V4.5 system routines? (N)

[A.44] Do you want to install the Global Reporter system routines? (N)

- The DBMAIN utility and P.DM library are now distributed and installed with GSM V8.11. This ensures the latest version of DBMAIN etc. are available for use with Global Sales Analysis;
- The GSM V8.11 installation creates two empty "stub libraries" P.\$CMLB3 and P.\$CMLB4 (see above);
- The 32-bit Global Development System installation process now allocates a new unit assignment, \$G, to the SYSSDB volume. The \$G unit assignment is reserved for future use.

The following changes to Speedbase Presentation Manager and Speedbase utilities have been implemented:

- 16-bit Speedbase PM has been relinked with the ESLK\$ and ESULK\$ routines (see below). Thus, Speedbase PM asserts Extended Shared Locks (if this option is enabled in the registry - see section 5.13). Unlike, 32-bit Speedbase PM, the various Lock Messages displayed by 16-bit Speedbase do NOT include the extended information. However, the \$STATUS LKE command (see above) can be used to display the Extended Lock information;
- A problem in the Speedbase Btrieve and Speedbase SQL interface that normally results in a spurious STOP 25507 from a Speedbase application, has been fixed. Under some conditions the Record Area can be filled with LOW-VALUES, instead of the documented HIGH-VALUES, when an End-Of-File condition is detected. This problem will only affect those applications that compare the Record Area with HIGH-VALUES to test for an End-Of-File condition;
- \$BADN and \$BADS have both been upgraded to support the Speedbase Btrieve/SQL "Longname" option. This option is described in more detail in section D.13.

Important Note: This change to \$BADN/\$BADS has introduced the following incompatibility between the version of \$BADN/\$BADS and the version of the Speedbase Gateway/NLM:

\$BADN	Gateway/NLM	Comments
Pre-V8.11 LongNames	Pre-V1.71	Allowed. Short names only (i.e. the option is ignored by the pre-V1.71 Gateway/NLM)
Pre-V8.11 the LongNames	V1.71, or later	Allowed. Short names only (i.e. option has no effect even though it is recognised by the V1.71, or later, Gateway/NLM)
V8.11 error 239.	Pre-V1.71	Not allowed. This will fail with an error 239.
V8.11 recognised by	V1.71, or later	Allowed. The LongNames option is the Gateway/NLM.

THE COROLLARY IS THAT IF YOU ARE USING THE V8.11, OR LATER, \$BADN/\$BADS THE GATEWAY/NLM VERSION MUST BE V1.71, OR LATER (OTHERWISE THE FATAL ERROR 239 WILL BE REPORTED DURING DATABASE CREATES, REBUILDS AND CONVERSIONS). NOTE THAT THE GATEWAY CHANGE WAS ACTUALLY IMPLEMENTED IN THE INTERNAL V1.71 VERSION, ALTHOUGH V1.78 IS THE EXTERNAL VERSION DESCRIBED IN APPENDIX D.13;

- Database conversions effected using \$BADN or \$BADS are now more forgiving towards operator errors and display a confirmation prompt before attempting to delete any databases. In addition, \$BADN and \$BADS also prompt the operator to confirm before overwriting an existing database if the source path-name is used for the output database. In previous versions of \$BADN and \$BADS, the only confirmation prompt that was issued was the "Is this the database that you wish to convert" prompt. Furthermore, during a Btrieve database conversion, \$BADN and \$BADS do not delete the database and schema file until the new data dictionary has been opened successfully. This prevents the accidental deletion of the database and schema files if the unit-id of the new data dictionary is invalid;
- \$BADN and \$BADS now display the Data Dictionary version during a database conversion. The second window in the Database Conversion option has been changed to display the ID and Generation Number of the Conversion Dictionary and prompts for a final "Y" response before proceeding with the database conversion. This additional prompt should help prevent database corruption/deletion if a database conversion is attempted by accident;
- The warning message displayed by \$BADN and \$BADS when a \$SEQ field is encountered during a database conversion has been changed from an ERROR to a DISPLAY to prevent this condition from terminating Job Management;
- It is now possible to run \$BADN immediately after running \$BADS in the same partition;
- The \$BADB utility has been enhanced to operate correctly with Informix SE 7.24 by correctly populating the SYSOBJSTATE internal system table. This fixes the problem when performing an Informix SQL SELECT statement that results in the following error message:

397: System Catalogue (SYSOBJSTATE) corrupted
- \$BADB has been enhanced to automatically concatenate the last 2 consecutive character fields when the 2Kb limit on the internal Record Conversion Table is detected. This alleviates the problem with large, complex database that can result in the following error message during database conversions (i.e. \$BADB option 1):

Record type too complex - translation table exceeds 2K
- The problem in \$BAST that results in an ILL LOAD AT AE3C when selecting the \$BAST Print Short Description option, has been fixed;

The following changes to the 16-bit Global Cobol Development System have been implemented:

- A new sub-routine, CACND\$, is now available for GSM (Windows) configurations only to determine if a program is executing on a fat-client or thin-client environment. The Controller Code is returned in a PIC 9(2) COMP field:

Value	Environment
1	Running on GUI controller (i.e. fat-client)
2	Running on SERIAL controller (i.e. serial screen)
3	Running on NETWORK controller (i.e. thin-client)

- \$TAP now recognises 2 new keywords in the OPTIONS section of the TAP:

GSMCONS Identifies the Terminal Attribute Program is for use with either GSMCONS.EXE or GLCONS.EXE (e.g. \$.730 and \$.731);

GUI-2 (sic) Identifies the Terminal Attribute Program is for use with the Global Application Explorer, GX.EXE (e.g. \$.911).

A complete description of these new options can be found in a White Paper on the Technology section of the Global web-site (see www.global3000.com/varworld/technolo/whitepap.html);

- Two new sub-routines, SESA\$ and GESAS\$, are available to access the Extended System Area (ESA - see section 5.13):

CALL SESA\$ USING addr length area * Set block in ESA (write)
CALL GESAS\$ USING addr length area * Get block in ESA (read)

Further details of these routines, which use SVC-91, are available upon request;

- Two new 16-bit sub-routines, ESLK\$ and ESULK\$ are now available to allow Extended Shared Locks to be set/reset from within 16-bit Speedbase (see above);
- The BASEL\$ sub-routine has been modified to prevent the problem that causes the baseline prompt to be cleared when the <UP-ARROW> function is keyed. This sub-routine change is only effective if the run-time system is also V8.11. A side-effect of this change that caused the KCR\$ sub-routine to suffer a MEMORY VIOLATION has also been fixed;
- A problems in OVLAY\$ that occasionally causes a hang when returning from an OVLAY\$ call, has been fixed. Furthermore, OVLAY\$ now correctly restores the various fields that control the 16-bit free memory allocation (SYFREE and SYSIZE). **IMPORTANT NOTE: ALL OVLAYS\$ OVERLAYS MUST TERMINATE WITH AN EXPLICIT "STOP RUN" RATHER THAN AN EXIT STATEMENT;**
- A new 16-bit sub-routine, FILBR\$, is available to display a standard Windows "File Browse" dialogue box. A complete technical description can be found in a White Paper on the Technology section of the Global web-site (see www.global3000.com/varworld/technolo/whitepap.html);

- A problem in \$DEBUG which prevented a debug command of the form "V 0 C15,2 EQ 112.68" being recognised as a valid value trap command, has been fixed;
- A problem in \$FORM that results in an OVERFLOW when a copy-book contains more than 127 fields, has been fixed;
- A 16-bit version of the IMAGE\$ sub-routine is available to display a named bitmap image on the Global Windows Workstation (GUI). The calling interface is simply:

```
CALL IMAGE$ USING st
```

where st is defined as:

```
01  ST
   02  STLEN      PIC 9(4) COMP      * Length of bitmap filename
   02  STURL      PIC PTR             * Pointer to bitmap filename
```

- A new SVC (SVC-88) has been implemented to allow SVC-61 operations to complete asynchronously. Details of SVC-88, which will form the basis of several new sub-routines that are currently under development, are beyond the scope of these notes;
- A problem with the Open TFAM Access Method that can result in a READ operation returning garbage under some conditions, has been fixed. This problem will only occur if the extended TFAM buffer option, that allows a block size larger than 256 bytes, is being used;

The following changes to the 16-bit Global Speedbase Development System have been implemented:

- The \$SDE Window Editor (invoked by <F9> Q) has been enhanced to recognise variables that include the underscore character. Prior to this change any attempt to edit a Speedbase window that included a variable with an underscore character would result in the message *** ERROR - DATA NAME EXPECTED;
- \$SDE has been enhanced to support a number of options added to the 32-bit compiler, \$SDL32, to support applications developed for GX. The following options are described in more detail in the (32-bit) Global Development Manual:

```
PAS    Password field option
NSL    Non-scrolled label option
SCL    Scrolled label option
OPT    Optional field
YNC    Y/N field presented in GX check-box format
```

- A new 16-bit "Speedbase-only" sub-routine, TXGUI\$, is available to display a standard Windows "Text Edit" dialogue box. A complete technical description can be found in a White Paper on the Technology section of the Global web-site (see www.global3000.com/varworld/technolo/whitepap.html);

A large number of enhancements to the 32-bit Global Development System and run-time software have been implemented. These enhancements will be fully documented in the 32-bit Global Development Manual that is currently being produced.

The following change to Global Configurator has been implemented:

- The limit of 200 Lock Table entries has been removed for GSM (Windows) configuration files. Furthermore, a warning message will appear if the number of Lock Table entries is more than 200 for non-GSM (Windows) configuration files.

The following change to Global File Converters has been implemented:

- The GSM (Unix) File Converter, FCONV-C2, now includes an option to specify the permissions of a newly created Unix file. The new "P" option allows the create permissions to be specified as an octal number rather than using the hard-coded default of 600 (384 decimal i.e. rw-----). Note that the actual permissions of the freshly created files is subject to the umask value of glintd which is currently set to 774 octal (i.e. rwxrwxr--).

2.11 Global System Manager Service Pack-1 (GSM SP-1)

The Global System Manager Service Pack concept is fully described in Appendix I.

Global System Manager V8.1 Service Pack-1 (GSM-SP1) includes several new features and significant enhancements to Global System Manager V8.1 revision V8.11:

- A problem in the start-up of newly installed non-PM systems, that results in an immediate termination of GSM after briefly displaying the following error message, has been fixed:

```
YOU ARE ATTEMPTING TO RUN A 32-BIT APPLICATION WHICH
REQUIRES A VALID 32-BIT SERVICE LICENCE.
```

The work-around solution, which involves setting the "..\Nucleus\Enable32Bit" registry setting to "Off", is not required if GSM Service Pack-1 is applied;

- The first release of the \$INSTALL utility is included with GSM SP-1. See document **cdreadme.doc** available on the Global Product Set (GPS) CD for further details. Note that \$INSTALL logs the details of all the newly installed products. Unlike some pre-release versions, the released version of \$INSTALL doesn't attempt to establish itself as a Supervisor Program;
- The first supported release of the 32-bit Menu Handler, \$MENU32, is included with GSM SP-1. Although fully compatible with the 16-bit Menu Handler, \$MH, the 32-bit Menu Handler allows more unit assignments and databases to be associated with each menu line:

Parameter	16-bit \$MH	32-bit \$MENU32
Number of unit assignments	8	48
Number of open databases	4 or 8	32

The 32-bit Menu Handler displays a descriptive warning message if a Speedbase database associated with a menu line, cannot be opened (the 16-bit Menu Handler displays no helpful information under these conditions).

A problem that caused a spurious STOP 8622 with the pre-release \$MENU32 when used on a GX thin-client, has been fixed. In addition, a problem that caused \$MENU32 to crash if <ESC> is keyed to the command box, has also been fixed.

The problem that causes a menu line with a password to generate a STOP 25304 has been fixed.

The released version of the 32-bit Menu Handler can run 16-bit Speedbase frames (in addition to 32-bit frame and programs). An "assist program" \$MENU16 has been created for this purpose.

\$MENU32 recognises the GX Help information and passes the extra information to the Global Application Explorer.

\$MENU32 has been enhanced to allow for "internal" type-ahead within menu files (i.e. type-ahead text that is intended for the Menu Handler, itself).

The 32-bit Menu Handler has been enhanced to interface correctly with V2.0 GX.EXE.

All the error messages displayed by the 32-bit Menu Handler appear in information windows when running on GX.

The 32-bit Menu Handler, \$MENU32, passes the Menu Version Number to GX.

The released version of the 32-bit Menu Handler, \$MENU32, now recognises "CUS", "AMEND" and "UPD" to perform the same functions as the 16-bit Menu Handler. Furthermore, when \$MENU32 is operating under Job Management the "GSM menu style" is emulated thus allowing all existing installation jobs to operate with the 32-bit Menu Handler;

- The first supported release of the 32-bit Menu Maintenance utility, \$MN32, is included with GSM SP-1.

The size of a 32-bit Menu File created by the \$MN32 utility is typically considerably larger than the original 16-bit Menu File. The size increase is approximately $(2048 + (N * 26440))$ bytes, where N is maximum number of possible menus configured in the Menu File.

A problem in the pre-release \$MN32 has been fixed. The results in the creation of a corrupt 32-bit Menu File if the 16-bit Menu file contains Access Rights definitions. The corruption is not detected when running \$MN32 but only becomes apparent when \$MENU32 is used with the 32-bit Menu File. The result is an EXIT 1201 from \$MH32.

The released version of the 32-bit \$MN32 utility has been enhanced to allow a reply of <CR> to the "Amend Menu" baseline prompt to terminate the menu update. This dialogue is identical to the equivalent 16-bit utility, MN.

A number of further problems in the pre-release version of \$MN32, including an EXIT 805, when amending SAA-style menus, have been fixed.

Important Note: For further information on the versions of \$MN32 and \$MENU32 released with GSM Service Pack-1 please refer to White Paper IN207 available from the Technology section of the Global web-site www.global3000.com/varworld/technolo/whitepap.html;

- The 16-bit Menu Handler, \$MH, has been modified to display the following warning message if the menu file is a 32-bit Menu File:

MENU FILE VERSION IS TOO HIGH - RUN \$MENU32 Key <CR>:

Furthermore, a problem in the 16-bit Menu Handler, \$MH, that results in an EXIT 25522 if an attempt to open a Speedbase database fails, has been fixed;

- The Software Node-id that can be customised into \$MONITOR by use of the \$F PUF command is ignored for all GSM (Windows) configurations. This change has been implemented to prevent the confusion that can arise if the Software Node-id is customised in several places. The unique warning message:

\$57 INITIATION WARNING 463 - SOFTWARE NODE-ID IGNORED

will appear if the Software Node-id has been customised into \$MONITOR.

The GSM (Windows) Node-id must only be customised in the "NodeID" setting in the registry, or by using the /EN GLOBAL.EXE command line argument;

- The GSM initiation has been enhanced to fully integrate with the GX Login Dialogue Box. Although the internal details of this change are beyond the scope of this document, it should be noted that terminal type 911 is always assumed when GX is running;
- A number of changes to \$E have been implemented to interface with the Global Application Explorer, GX. For example, a special "Partition Inactive" command is sent to GX by \$E.

GSM V8.1 SERVICE PACK-1 MUST BE APPLIED IF THE GLOBAL APPLICATION EXPLORER (GX) IS BEING USED;

- The \$AUTH Authorisation Utility has been enhanced to fully integrate with the GX Login Dialogue Box.

Important Note-1: The equivalent changes to \$PASSWD have **NOT** been implemented in GSM Service Pack-1 (However, see section 2.12 for further details).

Important Note-2: Any authorisation programs that have been developed to replace \$AUTH/\$PASSWD **MUST** be modified in order to integrate correctly with GX. Please contact Alan Underwood (alan@tissoft.co.uk) for further details of the minor changes that are required;

- Several of the 32-bit Speedbase DLM's (i.e. BA\$xxx) have been modified to interface with the Global Application Explorer (GX);
- The \$\$GX System Variable can be tested to determine if an application is running on the Global Application Explorer (GX);
- The GSM Start-up overlay, \$STARD, has been amended to use P.\$TAPS0, rather than P.\$TAP, for the name of the TAP library when displaying details of all the available TAP's that have been installed;
- The error message displayed by 32-bit Speedbase PM when a FILE FULL condition is detected has been enhanced to include both the record-id and the database name in the error message;
- The STOP codes produced by the 32-bit Speedbase DLM's (BA\$xxx) have been rationalised;
- Both the 16-bit and 32-bit versions of the B\$BAD sub-routine have been enhanced to allow a larger index file size increase than can be expressed as a simple percentage. It is now possible to specify a multiplication factor;

- The error message displayed by the loader when an Application DLM Library cannot be loaded, has been corrected to refer to \$P, rather than \$DP;
- A problem in the 32-bit Screen Formatting DLM that causes a NUMERIC CONVERSION error when an invalid (i.e. non-numeric) reply is supplied to a numeric field, has been fixed.
- A problem in \$INSPECT that causes an OVERFLOW when a very large file is inspected, has been fixed;
- A problem in the 32-bit MSORT\$ routine that can occur when sort operations are nested with other functions that cause Immediate Pointers to be pushed onto the Parameter Stack, has been fixed;
- A problem in the BA\$DSX 32-bit DLM that can result in a STOP 25004 when Pop Menus are nested with other advanced Middleware calls, has been fixed;
- The BELL verb is routed to the Global Application Explorer when a 32-bit Speedbase application is running under GX;
- A number of internal changes to \$BADN have been implemented in preparation for the release of a new SPEEDBAS.NLM that will allow 32-bit GSM (Windows) clients in addition to 16-bit GSM (Novell) clients to access a Btrieve format Speedbase database on a Novell file-server;
- A new EXEC'able module, \$BARTS, has been released to provide a number of utility routines for use by 32-bit Speedbase PM and the 32-bit Menu Handler, \$MENU32. Any attempt to run this module directly will result in a PARAMETER STACK error;
- The 32-bit Speedbase DLM's have been enhanced to display the extended Database lock information returned by the V1.77a, or later, Speedbase Gateway. These extended lock messages are displayed in a separate Dialogue Box when running on GX;
- The 32-bit Speedbase Database Manager has been enhanced to fix a long-standing problem with a \$SEQ field in a Maintenance window: Although an Add operation succeeds, the equivalent Insert operation fails with a RECORD ALREADY EXISTS error;
- Several cosmetic changes have been applied to the \$AUTHCNV utility. All the error messages displayed by this utility are now meaningful. In addition, \$AUTHCNV has been modified to generate a "V8.11 format" \$\$PASS file;
- A "Record Fetch Intercept" has been implemented in the 32-bit Speedbase Database Manager;
- The 32-bit loader now establishes the library name of the loaded Program, Frame or DLM, for future use by 32-bit Speedbase PM;
- The \$LIB "NSD" (remove symbolic debug option) has been extended to remove the symbolic debug information from 32-bit programs and DLM's;

- A new "multiple spooler" utility, \$SPM, is now available to allow several spool-unit/printer-device combinations, as defined by "..\Global\Client\Printers\SpoolUnitForPrinter5nn" registry settings, to be controlled by a single partition without the need to run multiple copies of \$SP;
- During this implementation the spooler, \$SP, has been improved to use the DEVIN\$ routine to test directly for the presence of a Print Device instead of attempting to open a work file on the printer. This change prevents the creation of large numbers of empty work files when the "printer" is mapped to a Windows spool directory.

Furthermore, a problem in \$SPS that causes a spurious operator to be displayed on the Spooler Status Screen, has been fixed;

- A problem in \$E that leaves the Date/Time Handler (e.g. %.W1D) on the User Stack, thus reducing the 16-bit User Area by 30 bytes, has been fixed;
- A problem in the 32-bit TXEDT\$ routine (in the BO\$EDI DLM) that results in an ILL OP CODE when using <F3> to copy lines, has been fixed;
- Two new, highly-specialised 32-bit sub-routines (RSRPR\$ and RSWPR\$, in DLM BO\$FI2) have been implemented to allow partial record read/write operations on RSAM files.

2.12 Global System Manager Service Pack-2 (GSM SP-2)

The Global System Manager Service Pack concept is fully described in Appendix I.

Important Note: GSM SP-2 can be applied directly to either "vanilla" GSM V8.11 or GSM SP-1 (i.e. there is no need to upgrade V8.11 to GSM SP-1 before applying GSM SP-2).

Global System Manager V8.1 Service Pack-2 (GSM SP-2) includes several new features and significant enhancements to GSM SP-1 (and Global System Manager V8.1 revision V8.11):

- A **VERY SERIOUS** PROBLEM in the handling of Speedbase LOCK's has been fixed. **THE PROBLEM ONLY AFFECTS 32-BIT SPEEDBASE APPLICATIONS RUNNING ON GSM V8.11 WHEN THE DATA IS HELD IN A BTRIEVE (OR SQL) FORMAT SPEEDBASE DATABASE.** The problem results in a lock asserted by one user being ignored as soon as the baseline message displaying the extended lock status appears for another user. **ALL SITES RUNNING 32-BIT SPEEDBASE APPLICATIONS ON GSM V8.11 WITH BTRIEVE (OR SQL) FORMAT DATABASES SHOULD APPLY GSM SERVICE PACK-2 IMMEDIATELY;**
- A **SERIOUS** problem in the 32-bit loader has been fixed. The problem causes a spurious STOP 108 to occur when any 32-bit frame or program is loaded from a serialised library. This problem will only occur on end-user serial numbers and does not affect reseller serial numbers;
- The prompt for the Speedbase Presentation Manager licence password now auto-terminates after 1 minute thus allowing an Automatic Bootstrap to continue. If the password prompt is auto-terminated in this way a log is written to the Event Log file (with a unique type code of "Y"). Note that this change was originally included in GSM V8.1d;
- \$MN32 now warns that a 16-bit Menu File will be converted to a 32-bit Menu File. **Important Note:** Earlier versions of \$MN32 performed the upgrade **WITHOUT** warning that the Menu File would be converted from 16-bit to 32-bit.

In addition, \$MN32 correctly prompts for the password of a Menu File that has been customised with both Master and Amend passwords.

Furthermore, a problem in \$MN32, that causes an ILLEGAL OPCODE AT pppp367A (where pppp is a page number) if the target menu file is IN USE, has been fixed. Another problem in the \$MN32 dialogue, that eventually results in an EXIT 11301, has also been fixed;

- A problem in \$MENU32, that causes an apparent hang when used with GX, has been fixed. The problem only occurs if the target menu of an "M" line is not found.

In addition, the 32-bit Menu Handler sub-routine, BO\$MEN, checks more values to test for an uninitialised 32-bit pointer. Either LOW-VALUES or HIGH-VALUES indicate that a PIC PTR field in the MI-block is uninitialised. Furthermore, the 32-bit Menu Handler now correctly pre-initialises all pointers to LOW-VALUES (rather than #0000FFFF).

Important Note: For further information on the versions of \$MN32 and \$MENU32 released with GSM Service Pack-2 please refer to White Paper IN207 available from the Technology section of the Global web-site www.global3000.com/varworld/technolo/whitepap.html;

- \$INSTALL now correctly displays the Product Description instead of the Long Volume Description of the original Installation Template Volume (ITV);
- A problem in \$LICENCE, that causes too many SVC-61 Close operations to be issued, has been fixed. The problem is not detected under normal circumstances but can produce spurious API Error Messages Boxes if the GSM (Windows) Diagnostics Display option is enabled;
- The NELIS\$ routine now produces a unique STOP 24002 if the Extended Find First/Find Next operations are not supported (by SVC-61). A STOP 24002 will result if \$LICENCE or \$INSTALL are used on an obsolete version of GLOBAL.EXE that does not support these operations;
- The 16-bit Open Direct Access Method (ODAM) has been enhanced to open read-only files in a read-only mode. This allows files on a Windows CD to be accessed by applications using the Open Direct Access Method. This version of the ODAM is used by the \$LICENCE utility;
- The 16-bit Debug Overlay, \$OV\$, now correctly logs all STOP and EXIT codes to the Event Logging file (if GSM Event Logging is enabled);
- \$PASSWORD has been enhanced to fully integrate with the GX start-up processing;
- A problem in \$BYE (and the \$STATUS TER command) that prevents a termination if any other user is running a 32-bit menu has been fixed;
- \$S has been enhanced to display the User Class for Reseller (RES) and Internal (INT) systems. No changes will be noticed on End-User systems;
- A new assist routine (DG\$001) for the new 32-bit debugger is now included in the system utilities DLM library, P.\$GSDLM. Note that the P.\$GSDLM library replaces the P.\$MNMAP library for GSM SP-2 and, eventually, GSM V8.1m. The GSMSP2 upgrade job performs this replacement automatically and copies a new \$\$DLM index file to reflect this name change (the system sub-routine DLM library P.\$SDLMO is NOT affected by this change).

Important Note: The system DLM index file, \$\$DLM, is subject to further changes and must **NOT** be modified to include application DLM libraries;

- A problem in \$BADN that terminates Job Management if a database contains a \$\$SEQ field, has been fixed;
- A new Speedbase menu file, \$BAM32, is now available. This menu is equivalent to \$BAM except that the "Return to Main Menu" line returns control to \$MENU32, rather than \$MH;

- A problem with the 32-bit version of the VIDEO\$ routine when used with some terminal types has been fixed. This 32-bit routine now functions correctly on all terminal types;
- A problem with the 32-bit PROG\$ routine has been fixed. This subroutine now works correctly;
- A new 32-bit routine, SIZOF\$, is available to return the length in bytes of a data item;
- The Autozap tag files (e.g. !BS) has been removed from all program libraries. This change is in preparation for the release of the replacement for Autozaps (\$GSP).

2.13 Global System Manager Service Pack-3 (GSM SP-3)

The Global System Manager Service Pack concept is fully described in Appendix I.

Important Note: GSM SP-3 can be applied directly to either "vanilla" GSM V8.11, GSM SP-1 or GSM-SP-2 (i.e. there is no need to upgrade V8.11 to GSM SP-2 before applying GSM SP-3).

Global System Manager V8.1 Service Pack-3 (GSM SP-3) includes several new features and significant enhancements to GSM SP-2 (and GSM SP-1; and Global System Manager V8.1 revision V8.11):

- The beta-test version of a new run-time utility, \$GSP, that applies Global Product Service Packs is included in this GSM Service Pack. The beta-test version of the Development System utility, \$GSPMAKE, that creates Global Product Service Packs is also available for those developers who wish to create their own Service Packs. The application of Global Product Service Packs is recorded in a Installation/Service Pack Log File (\$\$INSLOG). A new utility, \$INSLOG, is available to examine the Install Log File and to automatically email the log records to the Global Service Centre. For bespoke or customised sites, an Exclusion List of non-standard frames/programs will have to be maintained. A new utility, \$EXCLUDE, allows the creation and maintenance of the Exclusion List file (\$\$EXCLUD).

The documentation for \$GSP, \$GSPMAKE, \$INSLOG and \$EXCLUDE is currently under review but will be included in Appendix J in the next revision of these notes.

Note that all these utilities were formally released in GSM SP-4 (see section 2.14);

- A new option (Install Installation Logging) has been added to the \$CUS System Maintenance, Install Extra Facilities sub-menu. This option creates an empty Installation/Service Pack Log File, \$\$INSLOG on the unit specified; and assigns the permanent assignment \$\$L to this unit. If the unit specified already exists there must be at least 10Mb of free space. If the unit specified does not exist it will be created, with a size of 10Mb;
- A new option (Apply E-commerce User password) has been added to the \$CUS System Maintenance menu. The "E-commerce User" concept is fully described in Appendix K. \$AUTH, \$PASSWD and the various GSM start-up overlays have been modified to recognise E-commerce Users. Such users will appear in a \$STATUS list with an operator-id of a single "~" character followed by a unique 3 letter code. The Save/Restore Customisation has been modified to restore any E-commerce User customisations.
- The 32-bit Menu Maintenance utility, \$MN32, now includes a print option;
- The 32-bit Menu Handler has been modified to recognise the "Run Frame in 32-bit mode" flag in 16-bit Menu Files. This allows the 32-bit Menu Handler to run 16-bit Speedbase frames from 16-bit Menu Files. Earlier versions of the 32-bit Menu Handler produced a STOP

WITH 25015 when an attempt was made to run a 16-bit Speedbase frame from a 16-bit Menu File;

- A problem in the 32-bit Menu Handler that caused the incorrect Menu Title to be displayed on GX when returning to higher level menus, has been fixed;
- The 32-bit Menu Handler now correctly opens the 5th, and subsequent, Speedbase databases for type "E" menu lines in 16-bit Menu Files;
- The 32-bit Menu Handler and the 32-bit Speedbase GX-interface DLM (BA\$GXM) have been modified to provide a much faster interface to the V2.2 GX;
- A problem in the both the 16-bit Menu Handler, \$MH, and the 32-bit Menu Handler, \$MENU32, which results in a GUI-format screen being redisplayed in text-mode, has been fixed. The problem occurs if "\$" is keyed to obtain the Command Box then <ESC> is keyed to abort the command specification;
- A problem in 32-bit Menu Maintenance that causes a on OVERFLOW in \$MN000 when converting a complex 16-bit menu to 32-bit, has been fixed;
- A problem in GSM start-up that left the P.\$CMLB2 library open by all un-activated GX partitions, has been fixed;
- A problem with GX sign-on if the \$\$AUTH file is empty, has been fixed;
- A number of problems in GSM start-up when mixtures of GX and GUI thin-clients are used, have been fixed. In addition, a number of problems that could occur after a GX connection has been aborted, have also been fixed;
- The 32-bit versions of the DS-DT\$ and DL-DT\$ routines allow a date with a single digit year number (e.g. 6/2/1 is allowed - previous versions of the conversion routines required this date to be entered as 6/2/01);
- A number of new 32-bit subroutines are now available:

DENAX\$	Delete native Windows/Unix files
COPYX\$	Copy native Window/Unix files
NEOPN\$	Extended native Windows/Unix directory Open
EDTTX\$	Free-format text comment editor for GX
RECDS\$	Record-orientated comment editor for GX
STCON\$	String concatenation
STDDE\$	Set DDE interface parameters
GTDDE\$	Get DDE data
SNDDE\$	Send DDE data
PRIFN\$	Set name of DOSPrint file (also available in 16-bit)
FMESS\$	Format Windows error code to verbose message
SSCRN\$	Save screen details
RSCRN\$	Restore screen details
MCUS\$	Add line to menu file
ALLOC\$	Allocate sub-volumes

- The code in GSM start-up that removes any empty P.\$OV\$xx files from the \$DP (SYSRES) volume has been extended to remove any empty P.\$OV\$xx files from the optional \$OV volume;
- \$VOL performs a TFAM read on every text-file that it encounters in order to determine the possible Program Title. This file access can result in a STOP 8305 if the type TF file is non-standard (e.g. if it has been imported from a Windows file with a line width greater than 255 characters). This default behaviour has been changed to prevent the possibility of a STOP 8305. The original logic (i.e. to read every TFAM file) can be reinstated by using the "T" option;
- A problem in the C-ISAM version of the Speedbase Access Method (SPAM) that results in an OVERFLOW AT EF04, has been fixed. The problem is fixed by the GSM run-time (page \$PA050 in P.\$PAGES) so there is no need to re-link application code to incorporate this fix;
- An obscure problem in \$V that could occasionally result in the removal and corruption of existing sub-volumes when attempting to allocate a new sub-volume, has been fixed. The problem only occurs when attempting to allocate large sub-volumes on GSM (Windows) configurations using the gsmrpc protocol on slow disks and/or slow filing systems (e.g. FAT). The problem only occurs if the sub-volume allocation period exceeds the gsmrpc timeout period (default 5 seconds). \$V has been modified to return a NETWORK ERROR if the timeout period expires;
- \$E has been slightly modified to display the GSM Service Pack number correctly on the initial sign-on screen;
- The <BACKSPACE> character (0x08) is now allowed in the Function Key strings specified using <SYSREQ K>. This System Request has also been modified to remove the odd characters that appear when <DELETE> is used to delete characters in the string. In addition, the string is refreshed immediately, as each character is keyed, when <SYSREQ> K is used on GUI-1;
- A problem in \$STATUS that resulted in an ERROR 0 when using the LOC command on GSM (Unix) configurations, has been fixed;
- The "N" option of \$DEV (i.e. to run \$SDL32) has been extended to allow more than 4 32-bit DLM libraries to be specified to the LNK option;
- The spooler (\$SP, \$SPS and \$SPOOL) displays the time of all files that have been printed prior to the current date (previous versions of the spooler only displayed the date of such files);
- The serial number checking in \$AUTH (i.e. the logic that checks that the serial number embedded in the \$\$AUTH file is the same as the run-time serial number) has been relaxed for Reseller systems. This change allows a fat-client running with a Reseller serial number to sign-on to an end-user site that has \$AUTH authorisation enabled. This checking has also been relaxed for internal GSM systems;

- If the GSM Language Code is set to "DUT" both the sign-on prompt and \$AUTH password prompt are displayed in Dutch;
- A new, highly-specialised System Request, <SYSREQ V> is now available to dynamically change printer unit assignments and printer format letters;
- A new SVC that allows asynchronous SVC-61 compatible operations, has been implemented. This new SVC, SVC 88, is reserved for future use.

2.14 Global System Manager Service Pack-4 (GSM SP-4)

The Global System Manager Service Pack concept is fully described in Appendix I.

Important Note: GSM SP-4 can be applied directly to either "vanilla" GSM V8.11, GSM SP-1, GSM-SP-2 or GSM SP-3 (i.e. there is no need to upgrade V8.11 to GSM SP-3 before applying GSM SP-4).

Global System Manager V8.1 Service Pack-4 (GSM SP-4) includes several new features and significant enhancements to GSM SP-3 (and GSM SP-2 & GSM SP-1; and Global System Manager V8.1 revision V8.11):

- A problem in the Speedbase Access Method (SPAM) memory page (\$PA050) when used with complex C-ISAM format Speedbase databases has been fixed. The problem, which only affects records with many fields, normally results in a spurious "Unix Filing System Error 101";
- The released version of a new run-time utility, \$GSP, that applies Global Product Service Packs is included in this GSM Service Pack. The released version of the Development System utility, \$GSPMAKE, that creates Global Product Service Packs is also available for those developers who wish to create their own Service Packs. The application of Global Product Service Packs is recorded in a Installation/Service Pack Log File (\$\$INSLOG). A new utility, \$INSLOG, is available to examine the Install Log File and to automatically email the log records to the Global Service Centre. For bespoke or customised sites, an Exclusion List of non-standard frames/programs will have to be maintained. A new utility, \$EXCLUDE, allows the creation and maintenance of the Exclusion List file (\$\$EXCLUD).

The documentation for \$GSP, \$GSPMAKE, \$INSLOG and \$EXCLUDE is currently under review but will be included in Appendix J in the next revision of these notes;

- A problem in \$STATUS that can result in a NUM CONV error when listing users, has been fixed;
- The Suspend Partition handling in the 16-bit debug system has been improved to prevent the very high CPU usage that can occur when a partition is waiting for a reply to the following prompt:

Activate debugger, key D for Diagnostics report, H for Help, <ESC> to exit:

- A 32-bit version of the VIEW\$ sub-routines is now available. **Important Note:** The 32-bit version of VIEW\$ does NOT recognise the PRPGM field in the PR interface block;
- The 32-bit Menu Maintenance utility, \$MN32, has been modified to use the 32-bit VIEW\$ subroutine (q.v.);
- The 32-bit BA\$MID DLM has been modified to fix an ILL OPC problem that can occur in complex 32-bit applications that make use of the UFUN Middleware function;
- CFUDATE (\$INST1) has been enhanced to relax the checking when extra

users are added to a configuration file. The following message has been down-graded from an error message, that prevents the configuration file from being updated, to a milder warning message:

NUMBER OF SCREENS HIGHER THAN ALLOWED MAXIMUM

See section K.2 for further details;

- The GX interface (SVC-86) has been significantly enhanced to prevent the STOP 8628 problem that can occur if the GX transmit buffer is too small. See sections 5.16 and 5.18 for full details of the compatibility between GSM SP-4 and versions of GSM (Windows) GLOBAL.EXE and GLCONS.EXE;
- Changes have been made to a number of 32-bit DLM's to (further) improve the performance of the GX interface;
- The handling Speedbase GX baseline messages has been improved;
- A problem in the 32-bit Menu Handler when displaying the "Critical Assignment" dialogue box, has been fixed;
- Some changes to the handling of the 32-bit End-Of-Job (EOJ\$) routine have been implemented.

Important Note: 32-bit applications should only use End-Of-Job (EOJ\$) routines to protect against abnormal termination of the program either through an I/O error, program error or the user keying <CTRL W>. EOJ\$ routines should **NOT** be used to execute routines on the normal termination of the program. The UNLOAD DIVISION should be used for this purpose. **The EOJ\$ routine must be detached by calling EOJ\$ with no parameters before the program terminates normally.** This is best done in the UNLOAD DIVISION. Failure to detach the EOJ\$ routine before normal termination of the program will result in a fatal error.

Special care must be taken to detach EOJ\$ routines when converting 16-bit programs to 32-bit programs. In some 16-bit programs, depending on a number of conditions, the 16-bit EOJ\$ routine may be able to complete successfully on normal termination of the program. This is no longer the case for the 32-bit EOJ\$ routine in 32-bit programs;

- The EOJ\$ processing in B0\$MEN has been improved (see above);
- The 32-bit SSCRN\$ sub-routine now functions correctly when used with GX.

2.15 Global System Manager Service Pack-5 (GSM SP-5)

The Global System Manager Service Pack concept is fully described in Appendix I.

Important Note: GSM SP-5 can be applied directly to any of "vanilla" GSM V8.11, GSM SP-1, GSM SP-2, GSM SP-3 or GSM SP-4 (i.e. **there is no need to upgrade V8.11 to GSM SP-4 before applying GSM SP-5**).

Global System Manager V8.1 Service Pack-5 (GSM SP-5) includes several new features and significant enhancements to GSM SP-4 (and GSM SP-3, GSM SP-2 & GSM SP-1; and Global System Manager V8.1 revision V8.11):

- \$AUTH has been enhanced to support GX "Demonstration" users. When a "Demonstration" user signs in to GSM the Authorisation parameters are taken from the entry in the \$AUTH file with the operator-id "DEMO";
- \$BADN has been enhanced to allow a client running GSM (Windows) (i.e. GLOBAL.EXE or GLCONS.EXE) to connect to the Speedbase NLM (SPEEDBAS.NLM) running on a Novell server;
- A problem in \$BBS that results in an Overflow if the size of a Windows file displayed by the List command is larger than 99,999,999 bytes (i.e. approx. 96Mb), has been fixed. Furthermore, \$BBS now contains additional checking to ensure that only those Windows files created by the \$BBS Export function are considered valid by the Import function. The error message "ILLEGAL \$BBS FILE" or "INVALID FORMAT \$BBS FILE" will be displayed if the input file for the Import function is not a valid \$BBS file;
- \$CUS now ensures there is sufficient free space (10Mb) on the \$\$L unit before attempting to copy the \$\$INSLOG file;
- A new 32-bit debugger, \$DEBUG, has been released with GSM SP-5. All 32-bit developers should already be aware of the capabilities of \$DEBUG;
- \$FORM32 has been enhanced to allow a reply of <ESC> to terminate the Edit Phase when running under Job Management;
- \$GSP has been enhanced to consider GSP's that have been superceded by a newly installed Global cabinet File as "applied". Furthermore, \$GSP now recognises GSP files with a lower-case file-name. For example, za50_000001.gsp is now recognised by \$GSP as a valid GSP file (earlier versions of \$GSP would fail with the error message "Internal/product version does not match"). Several of the error messages displayed by \$GSP have been made more precise to aid trouble-shooting. If a GSP fails to apply, a warning message describing the failure is displayed;
- The Service Pack History option of \$INSLOG has been enhanced to display a warning message if no Global Product Service Packs have been applied to the selected product. The correct Operator-id from the \$\$INSLOG log-file is now written to the Email report file;
- \$INSTALL now works correctly if the intermediate work unit used during the installation already exists. The "Installed" Y/N flag is

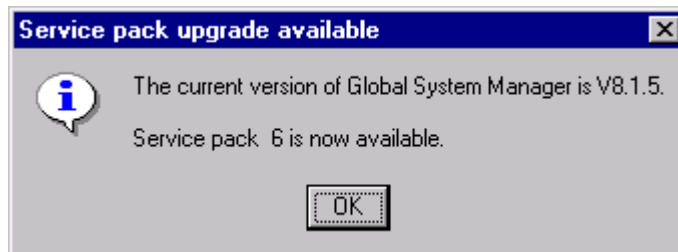
now displayed correctly when paging through the list of available products;

- A problem in \$MN32 that caused a variety of problems when modifying the colours of SAA-style menus, has been fixed. A **SERIOUS** problem that results in a corrupt menu when a 16-bit menu is converted to 32-bit, **without any concomitant changes**, has been fixed. A further problem that can result in the changes to a menu being ignored, has also been fixed;
- A new highly-specialised option to automatically retry FILE IN USE errors has been implemented;
- A number of changes to the initial Debug Overlay to support the 32-bit debugger, \$DEBUG, have been implemented;
- The error dialogue box displayed when an E-commerce user attempts to run a standard frame now only appears once;
- A new utility, \$NSD, is available to remove Source Debug information from programs/frames that have been compiled with the SD option. Note that the \$LIB NSD option can be used to remove SD information from programs/frames within libraries;
- A problem with \$PASSWD that results in a hang until ^W is keyed on partitions-2, and above, on GX screens, has been fixed. Furthermore, \$PASSWD has been enhanced to support GX "Demonstration" users. When a "Demonstration" user signs in to GSM the Authorisation parameters are taken from the entry in the \$\$PASS file with the operator-id "DEMO";
- A problem in \$S that causes an OVERFLOW if E-commerce user(s) are added to a 9999 user system, has been fixed. Note that a 32-bit version of \$S (\$S32) has been created, but has not been released;
- \$SCHEMA has been enhanced to support a new Advanced Desktop command line type;
- A new version (V2.40) of the 32-bit compiler, \$SDL32, is now available. All developers should already be aware that this version of the compiler has been released via Global Development System Service Pack-5. The number of DLM's specified during a single compilation has been increased from the previous limit of 127. The problem that caused a variety of spurious warning and error messages when sources that contain comments outside FRAME/ENDFRAME keywords are compiled with the SD option, has been fixed. A problem with the OPTION IGNORE clause on ISAM FD's has been fixed. This version of the compiler generates Symbol Table entries for all non-referenced symbols defined in the compilation (this change is required for \$DEBUG).

Important note-1: The Source Debug option "SD" is now enabled by default. All 32-bit frames/programs compiled with the default compiler options will generate object files approximately 2 - 5 times larger than the same object files created by earlier versions of \$SDL32. Use the "NSD" option to prevent the generation of Source Debug information in the 32-bit object files.

Important note-2: The version of \$DEBUG released with GSM SP-5 will only recognise Source Debug (SD) information generated by the V2.40, or later, version of \$SDL32;

- A minor problem with \$SPS that resulted in missing text from the spooler status screen, has been fixed;
- The \$STARD start-up overlay has been enhanced to recognise a "Demonstration User" and to map an operator-id of "DEMO" to "|abc", where abc are unique for all users. Furthermore, \$STARD has also been modified to allow the Terminal Type to be supplied directly from the thin-client;
- A new start-up overlay, \$STARX, has been released to perform a variety of 32-bit "house-keeping" functions. In particular, \$STARX checks if a more recent GSM Service Pack than the GSM Service Pack that is currently installed, is available. The following warning message is displayed if the current version of GSM has been superceded by a new Service Pack (provided a suitable version of



GLOBAL.EXE is running):

Important Note: \$STARX only operates on a GX screen;

- A number of changes to the Speedbase 32-bit DLM's, within library P.\$SDLMO, have been implemented. A new version of BA\$DBD has been released which fixes the problem that causes a subsequent ILL OPC in either BA\$DBX or BA\$EXE. Furthermore, the BA\$DSX DLM has been enhanced to operate correctly with 8-bit TAP's (e.g. \$.811 and \$.814 etc.).

A change to the GX Window Manager, BA\$GEX, has been implemented to improve the manner in which it clears fields in ADD and INS modes. In ADD/INS modes, the Window Manager needs to clear (zero or space fill) each acceptable field (i.e. as stored in memory on the data-record etc.), before the field can be displayed or accepted on the screen. Traditionally, the Window Manager has achieved this effect by clearing each field incrementally as it encountered it. The Window Manager maintained a count of the highest field number cleared, and thus cleared each field during the normal field-list processing. This technique was used to avoid having to clear all of the fields before any action took place on the screen. This incremental clearing was necessary on slow processors when the time taken to clear every field introduced a noticeable delay. The Window Manager has been modified to clear all the appropriate fields BEFORE ADD or INS mode commences (i.e. before processing starts for the first field). With this change, it is therefore now permissible to use a default (or V- or B-) routine for a field TO SET UP DEFAULTS or otherwise change the values of ANY OF THE FIELDS declared later in the same window. In ADD/INS modes this was not previously possible, because any default set up by the application would (usually) be cleared by the Window Manager as, and when, processing

moved on. Note that during MNT/EDT modes this technique has always worked, as no fields are cleared during processing. This change makes it much easier to set up a group of default values, or to replace or update a set of values, in one section of code. Currently you have to code individual routines for each field, with code to control when new default values need to be moved. This can now all be done by a single Routines Section routine, and the default/changed value set up is preserved in all modes (ADD/INS/EDT/MNT).

Further changes have been applied to BA\$GEX fix the problem in EDT mode windows when the <CLR> key is used; and the problem that results in an ILL OPC in BA\$GEX, under some conditions;

The problem that caused a STOP 25061 in BA\$GUI has been fixed. In addition, the problem that prevented the <End> key from working with GX has been fixed;

A problem that caused an ILL OPC in BA\$EXE on GX screens has been fixed;

A problem with the handling of immediate pointers in BA\$MID has been fixed. This problem caused several odd results in 32-bit applications that include nested B\$RLK and B\$QFUN calls; and mixtures of B\$RLK and B\$QFUN calls;

The B\$ERR, B\$WARN and B\$HILI calls that were originally implemented for GX are now supported on GUI-1;

The changes to the Speedbase Window Manager (BA\$WEX) to preserve the attribute of a field displayed in attribute-8 (A8) in the scrolled area has been extended to support attributes 13 and 14 (A13 and A14);

- The problem in BO\$AMS that causes a STOP 8310 when "Open GUI TFAM" is used on some GSM (Unix) configurations, has been fixed;
- A problem in BO\$EDI that causes a STOP 25055 in EDTTX when used by \$GSP has been fixed;
- The Menu Title is now established correctly for all menus when used with GX. Furthermore, the problem that results in a NO BASE exception when a menu with a mnemonic length of 0 is used on GX, has been fixed;
- The DT-DL\$, DT-DS\$ and TIME\$ routines now call MIDN\$ to effect an automatic date/time roll-over at midnight if the "AdvanceTimeAtMidnight" registry option is enabled;
- The LNCONV utility, which is required for some 16-bit \$COBOL to 32-bit conversions, has been enhanced to allow a 2-phase source-conversion. The 2-phase conversion is required when the length of the new "short-name" symbols that are unique in the first 6 characters are longer than the original "long-name" symbols;
- The SCHEM\$ and SHCMD\$ routines have been enhanced to recognise the new Advanced Desktop command line type which allows more control over the action to be followed after the target program has terminated. Furthermore, the SHCMD\$ routine has been enhanced to use

a different by-pass escape sequence when transmitting the command string to GUI. This change avoids problems when Speedbase attempts to read the screen image within the window that contained the SHCMD\$ call;

- A number of new 32-bit sub-routines are now available:

RUN\$E\$	Run \$E, if \$E is allowed
MBOX\$	GX-only simple Message Box
MBOXX\$	GX-only advanced Message Box
CTRLG\$	GX-only display button that sends ^G to host when clicked
CHK\$E\$	Test if \$E is allowed
COPYX\$	Same as COPY\$ but allows shared files to be copied
RESOL\$	Resolve a page-name/symbol-name pair to a 32-bit address
ECOMM\$	Return an exception if not an E-commerce user
GXVER\$	GX-only routine to return the version of GX
FADEL\$	GX-only routine to display a File Already Exists dialogue box
TXGUX\$	GUI-1 formatted text editor (not for general use)

- COPYX\$ now allows the Windows "open mode" to be specified by a 3rd PIC 9(4) COMP optional parameter. The following modes are allowed:

0	No share, read-only
1	No share, write-only
2	No share, read/write
32	Share for read, read-only
33	Share for read, write-only
34	Share for read, read/write
48	Share for write, read-only
49	Share for write, write-only
50	Share for write, read/write
64	Full share, read-only
65	Full share, write-only
66	Full share, read/write

- The OPDE\$ routine has been enhanced to use FADEL\$ when used on a GX screen;
- In addition to the standard sub-routines listed above, the following 32-bit sub-routines kindly supplied by Abaca Systems are also available for general-purpose use:

SLJ\$\$	Left justify string
SRJ\$\$	Right justify string
SCON\$\$	Concatenate two strings (optional third parameter is the number of spaces to leave between them)
SLEN\$\$	Return Actual Length of String
STRM\$\$	Terminate string with a given byte
SSUB\$\$	Return sub-string of a given string

3. GLOBAL SYSTEM MANAGER EXECUTIVE VERSIONS

The Global System Manager V8.1 executive library, +.J0, has been re-released with each revision of Global System Manager V8.1. The version of a particular executive, within the +.J0 library, can be determined using the \$LIB utility. In general, when a new version of an executive is released the **upper-case letter** in the member title will be increased. For example:

```
+JOEE00      V8.1G  PRINTER EXECUTIVE
```

Executive versions are normally independent of the revision of Global System Manager V8.1. Any exceptions to this rule are documented in the relevant section of this note. Furthermore, executive versions are always suitable for external release (i.e. there is only a single numbering scheme for executive versions).

The version letter in the title of the +.J0 executive library will usually be the same as the version of the member with the highest version letter.

The \$CUS "Apply nucleus update" option in the \$CUS System Maintenance sub-menu should be used to upgrade the revision of the Global System Manager nucleus software from the BACRES diskette.

3.1 Global System Manager executives released with revision V8.1c

The +.J0 nucleus library re-released with Global System Manager V8.1 revision V8.1c includes 1 new component and upgrades to 3 existing components. All 4 new components are identified by the version V8.1E in their library member titles.

- The new component, +JONS78, is required to implement the extended ASSIG\$ table;
- The Steering Routine, +JOS000, has been modified to implement the extended ASSIG\$ table;
- The Printer Executive, +JOEE00, has been repackaged to fix the problem that caused alignment patterns to lose pagination. Although the alignment pattern is printed correctly, the actual printed forms are printed too high on the page.

This problem is caused by a bug in the V8.1 Printer Executive. The problem is fixed in the V8.1E Printer Executive. The following zap (Z.81J01E) fixes the problem in the V8.1B Printer Executive:

```
ZZZZZZ
GVWYZN
GXPGDL
HGQGSM
GXNFTG
QJWGZP
XVMRWY
QMHPVY
YPZJVQ
FJDMYB
```

- The File Executive, +JOEA00, has been modified to improve the situation described in Global Technical Bulletin GT738 (14th February 1995) concerning the number of files per subvolume. When a subvolume is created using the V8.1E File Executive, the number of files per directory is written to the directory. If the V8.1E File Executive detects that the files per directory in the directory is different from that defined in the configuration file ERROR v will be returned.

3.2 Global System Manager executives released with revision V8.1d

The +.J0 nucleus library re-released with Global System Manager V8.1 revision V8.1d includes upgrades to 5 existing components:

- The Printer Executive, +JOEE00, has been repackaged to fix a serious problem that causes random memory corruption during the printing of a print line that contains a Printer Control Byte of -6. **THIS PROBLEM IS VERY SERIOUS AND CAN LEAD TO MANY UNDESIRABLE SIDE-EFFECTS INCLUDING COMPUTER CRASHES.** The following zap is available to fix the problem in the V8.1F version of +JOEE00:

```
ZZZZZZ
GVWYZN
GXPGDL
HGQGSN
GXNFTG
QJWGZP
VXGHLT
QLSVXY
XBXXZS
DWTJGB
```

The Printer Executive also recognises bit-5 (i.e. #20) of the PRINTER EXECUTIVE FLAG BYTE. If this bit is CLEAR (i.e. the default value of the Printer Executive Flag Byte is 0xFF so changing the value to 0xDF will clear bit-5) the Printer Executive will continue to send hardware page throws regardless of the Logical Page Depth (as specified by an application). This option **MUST** be enabled if Global applications are to be used in conjunction with the "Printerface" product.

The latest version of +JOEE00 is V8.1G.

- The Auxiliary Printer Controller, +JOCE50, has been repackaged to fix the problem that prevents it being used on a Global System Manager (MS-DOS) or Global System Manager (Novell NetWare) configuration. The problem that caused spurious characters to appear on the screen during auxiliary printing has also been fixed. The latest version of +JOCE50 is V8.1C;
- The Steering Routine, +JOS000, has been repackaged to include an enhancement to allow the name of the configuration file to be specified when loading Global System Manager. This change allows a "trusted" backup configuration file (e.g. *.5700XD) to be used if changes to a "live" configuration file (e.g. ++5700XD) prevent Global System Manager from loading. Before Global System Manager is loaded the name of the default configuration file will be displayed on the integral screen (with the "?" character indicating a wildcard). For example:

```
:++5700??
```

If a character is keyed within 1 second of the display, the name of the default configuration file may be modified (see section 1.5 of the V8.1 Global File Converters Manual for a description of the recommended naming convention for "backup" configuration files). The <CURSOR-LEFT> and <CURSOR-RIGHT> keys may be used to text-edit the file-name. Terminate the reply with <CR>. This new feature can only be used on IBM PC compatible computers that include an integral

screen. The latest version of +JOS000 is V8.1F;

Important note: It may be necessary to disable this feature when Global System Manager is loading as a Windows background task in conjunction with the Global Windows Workstation operating in "internal host" mode as a Windows foreground task. If the Windows background priority of GSMLOAD.EXE is too low the automatic 1 second timeout may never elapse resulting in an apparent "hang". For example, if this problem occurs on Windows 95, use Windows Explorer to amend the Properties of the GSMBOOT.PIF "Shortcut to MS-DOS". Select the "Misc" tab in the Properties dialogue box. Ensure the "Background Always suspended" option is disabled and set the Idle Sensitivity slider to the low position.

The following tailoring zap removes the new enhancement from the V8.1F Steering Routine:

```
ZZZZZZ  
GVWYZN  
GXPQGL  
GXNQZM  
GXNFTG  
QJWLML  
VYZPKF  
QXVNKG  
WZSFKF  
DMNYMV
```

- The LAN Executive, +JOEF00, has been repackaged to fix a problem that causes persistent network errors if a new LAN controller is added to a configuration file. The latest version of +JOEF00 is V8.1B;
- The Console Executive, +JOEB00, has been repackaged to operate with V2.0 of the Global Windows Workstation.

Furthermore, the Console Executive has been enhanced to optimise the storage of the Bright video attribute for colour integral screens (e.g. when using terminal type \$.519). This change removes the requirement to configure 2 attribute bytes (instead of the default of 1) in order to preserve the Bright attribute during screen refresh (i.e. both full screen refreshes that occur during a partition swap and partial screen refreshes initiated by Speedbase Presentation Manager). The latest version of +JOEB00 is V8.1L.

3.3 Global System Manager executives released with revision V8.1e

The release of Global System Manager V8.1 revision V8.1e did not involve any changes to the executives.

3.4 Global System Manager executives released with revision V8.1f

The +.J0 nucleus library re-released with Global System Manager V8.1 revision V8.1f includes 1 new component and upgrades to 4 existing components.

- The new component, +JONS80, has been released to provide additional text-string manipulation functions which are required by some of the new V8.1f utilities;
- The File Executive, +JOEA00, has been repackaged to support the new operation (opcode 42) required by the \$V "Quick SSD Allocate" option (described in section 2.4).

The latest version of +JOEA00 is V8.1H;

- The Console Executive, +JOEB00, has been repackaged to support a new setting of the CONSOLE EXECUTIVE FLAG BYTE. If the CONSOLE EXECUTIVE FLAG BYTE is set to #FF all characters will be discarded until the console is enabled by an application program issuing a Console Executive operation to reset the flag to #00. This facility is only expected to be useful for specialised Comms applications where the Global System Manager Contract Protection Message would interfere with a modem. DO NOT SET THE CONSOLE EXECUTIVE FLAG BYTE TO #FF UNLESS YOU HAVE WRITTEN AN APPLICATION THAT CAN FREE THE CONSOLE CHANNEL.

The Console Executive also supports the "hard-coded" Automatic Operator ID and Terminal Type options that are enabled using the Special Customisation option of \$CUSA;

The Console Executive has been enhanced to support the Global System Manager language translation mechanism. Although the technical details of this change are beyond the scope of this document, it should be noted that the Console Executive will treat numeric and alphabetic strings that are prefixed by a "~" character (i.e. 0x7e) as translatable strings when the translation option is enabled.

The Console Executive initialisation code has been restructured to overlay some of the control blocks making a saving of approximately 950 bytes in the Global System Manager nucleus.

Three **important** bugs that affect Hyperport family (i.e. Hyperport, PCC/Ni, Superport and Hyper/MX) configurations have been fixed. The first problem causes corruption of the User Elements which results in a number of different symptoms. The most common symptom is the appearance of spurious, intractable TOO MANY OPEN FILE error messages during bootstrap. The second and third problems result in a hang during the loading of the +JOEB00 component. All of these problems only occur on medium-sized Hyperport configurations (e.g. 8, or more, screen) and will disappear once the number of Hyperport consoles has been reduced below a certain critical limit.

The Console Executive now includes a diagnostic option, enabled by the following tailoring zap (applied to +.J0), which displays the layout of memory (i.e. control blocks and buffers) on the Hyperport family card:

```
ZZZZZZ
GVWYZN
```

GXPGDL
HFPZXJ
GXNFTG
QJWLML
VYYTQB
RMRHCV
VMCLXN
FZBVZV

The diagnostics are displayed on channel-1 at 9600 baud.

The Console Executive has been enhanced to prevent the screen from being cleared when a width-change (i.e. 80 characters to/from 132 characters) is attempted on the Global Windows Workstation.

The latest version of +JOEB00 is V8.1P. This version of the Console Executive returns an "internal version number" of 0x88;

- The LAN Executive, +JOEF00, has been repackaged to support the new operation (opcode 42) required by the \$V "Quick SSD Allocate" option (described in section 2.4). In addition, the LAN Executive includes an option to maintain a count of each type of LAN operation, and the amount of data read and written across the network by a workstation. The option to log statistics is enabled by setting bit-0 (i.e. the #01 bit) in the LAN EXECUTIVE FLAG BYTE (although no external utilities are currently available to report on the information logged by the LAN Executive).

The latest version of +JOEF00 is V8.1C;

- The Steering Routine, +JOS000, has been enhanced to automatically load the +JONS80 module (see above).

The Steering Routine has also been enhanced to by-pass the loading and initialisation of "virtual controllers". This technique is reserved for future use.

The feature, introduced in the V8.1F +JOS000, that allows the name of the configuration file to be specified when loading Global System Manager has been improved. The configuration name prompt will only appear on Global System Manager (BOS) configurations (i.e. configuration codes 5700 - 5711). The prompt will no longer appear on Global System Manager (MS-DOS and Windows) or Global System Manager (Novell NetWare) configurations (this prompt has never appeared on Global System Manager (Unix) configurations). This functionality has been removed for Global System Manager (MS-DOS and Windows) and Global System Manager (Novell NetWare) to prevent "hanging problems" when a background Global System Manager task is used in conjunction with the Global Windows Workstation (GUI) in internal host mode. Note that several alternative techniques are available to select the name of the configuration file on Global System Manager (MS-DOS and Windows) and Global System Manager (Novell NetWare) configuration (see below).

For Global System Manager (BOS) configurations, when the configuration file name prompt times out (after 1 second), the cursor is positioned to the right of the 8 character field to indicate that the bootstrap process has started. If the reply to the configuration file name prompt is terminated with a <CTRL D>, instead of the normal <CR>, then the Steering Routine diagnostics (that are normally

enabled when the name of the configuration file ends in a "D") are enabled automatically (i.e. without the need to rename the configuration file on SYSRES or SYSIPL).

To summarise the various techniques that are available to override the default configuration file name:

Configuration	Technique(s)
GSM (BOS)	Specify name to the Steering Routine prompt
GSM (MS-DOS)	Set the GLCONFIG environment variable Use the GSMLOAD.EXE /EC command line option
GSM (Novell)	Set the GLCONFIG environment variable Use the GSMLOAD.EXE /EC command line option
GSM (Unix)	Set the GLCONFIG shell environment variable
GSM (Win NT)	To be announced

To summarise the various techniques that are available to enable the Steering Routine diagnostics:

Configuration	Technique(s)
GSM (BOS)	Rename the configuration file name to end in a "D" Reply to the Steering Routine prompt with <CTRL D> Terminate the reply to the Steering Routine prompt with <CTRL D>
GSM (MS-DOS)	Rename the configuration file name to end in a "D" Use the GSMLOAD.EXE /D command line option
GSM (Novell)	Rename the configuration file name to end in a "D" Use the GSMLOAD.EXE /D command line option
GSM (Unix)	Not applicable
GSM (Win NT)	Not applicable

The latest version of +J0S000 is V8.1H.

3.5 Global System Manager executives released with revision V8.1g

The release of Global System Manager V8.1 revision V8.1g did not involve any changes to the executives.

3.6 Global System Manager executives released with revision V8.1h

The +.JO nucleus library re-released with Global System Manager V8.1 revision V8.1h includes upgrades to two existing components.

- The Console Executive, +JOEB00, has been repackaged to support 2 new escape sequences that allow the "GUI mode" to disabled/re-enabled under program control. This feature may be used by future versions of the Menu Handler. The Console Executive also supports a new operation that allows Character Translation to be disabled/re-enabled (i.e. the Character Translation that is determined by the TRANSLATIONS section of the TAP and/or the contents of the \$TRtttt file, created and maintained by <SYSREQ> B). This new operation is required by File Transfer utilities (e.g. FTRAN) that require characters to be transmitted and received without translation.

The changes to the Console Executive that were added to support the Global System Manager language translation mechanism (see section 3.4) have been rescinded. This has been necessary to prevent problems with Speedbase applications when text-strings containing the tilde character (0x7e) are displayed and accepted. Note that the Global System Manager language translation mechanism, which has not been fully implemented, should not be confused with the Console Executive Character Translation facility described in the previous paragraph.

The bug that caused characters to be lost occasionally when swapping partitions on a "GUI screen" has been fixed.

The latest version of +JOEB00 is V8.1R. This version of the Console Executive returns an "internal version number" of 0x89;

- The Commercial Code Interpreter and SVC module, +JON000, has been enhanced to support the extended SVC-18 interface required for the version of the Open TFAM Access Method that supports a block size larger than 256 bytes (see section 2.6).

The latest version of +JON000 is V8.1A.

3.7 Global System Manager executives released with revision V8.1i

The +.JO nucleus library re-released with Global System Manager V8.1 revision V8.1i includes an upgrade to one existing component:

- The Commercial Code Interpreter and SVC module, +JON000, has been enhanced to support the new operation required by the CHKPG\$ subroutine (see section 2.7) to determine whether a particular memory page is loaded.

The latest version of +JON000 is V8.1S.

3.8 Global System Manager executives released with revision V8.1j

The release of Global System Manager V8.1 revision V8.1j did not involve any changes to the executives.

3.9 Global System Manager executives released with revision V8.1k

The release of Global System Manager V8.1 revision V8.1k did not involve any changes to the executives.

3.10 Global System Manager executives released with revision V8.1i

The release of Global System Manager V8.1 revision V8.1i did not involve any changes to the executives.

4. GSM (BOS, DOS, WINDOWS 3.x & NOVELL) CONTROLLER AND BACNAT VARIANTS

This section describes repackages of the Global System Manager (BOS), Global System Manager (MS-DOS and Windows) and Global System Manager (Novell NetWare) controller and BACNAT software.

4.1 Controller variants

The variant of a particular controller, within a controller library (e.g. +J5), can be determined using the \$LIB utility. In general, when a new variant of a controller is released the **variant number (n.n)** in the member title will be increased. For example:

```
+J5CB01      V4.3 INTEGRAL CONSOLE
```

Controller variants are normally independent of the revision of Global System Manager V8.1. Any exceptions to this rule are documented in the relevant section of this note.

The variant number in the title of the master controller library (i.e. +J5 or +JW) will usually be the same as the variant of the member with the highest version letter.

The \$CUS "Apply nucleus update" option in the \$CUS System Maintenance sub-menu should be used to upgrade the variant of the Global System Manager controller software from the BACRES diskette. The BACNAT software is upgraded by copying the relevant MS-DOS files from the BACNAT diskette to the appropriate directory on the hard-disk.

Very rarely, in special circumstances, you may be using an "Internal Release" version of a controller. Internal Release controllers are normally only used within Global Business Systems for internal testing but may occasionally be released externally for informal evaluation, beta-tests or during the course of a problem investigation. Internal Release controllers are not supported and are never generated by our Production Department although they may be available on the BBS from time-to-time. Internal Release controllers are always referred to by an **upper-case version letter** (e.g. V4.3A).

4.2 BACNAT variants

In general, the variant of a Global System Manager (MS-DOS and Windows) or Global System Manager (Novell NetWare) BACNAT module can be determined from the date and size of the MS-DOS file. However, there are some exceptions to this rule. For example, a command line switch can be used to display the variant of GSMLOAD.EXE; the GSM.NLM variant number is displayed on the top line of the NLM screen.

BACNAT variants are normally independent of the revision of Global System Manager V8.1. Any exceptions to this rule are documented in the relevant section of this note. However, BACNAT variants are often dependent on the variant number of related controllers. Any dependencies of this nature are documented in the relevant section of this note.

In general, when a new variant of a BACNAT component is released the **variant number (n.n or n.nn)** will be increased. All the files on a Global System Manager (MS-DOS and Windows) BACNAT will have the same variant number as GSMLOAD.EXE. All the "workstation files" on a Global System Manager (Novell NetWare) BACNAT will have the same variant number

as GSMLOAD.EXE; all the "file-server" files on a Global System Manager (Novell NetWare) BACNAT will have the same variant number as GSM.NLM. Note that GSMLOAD.EXE and GSM.NLM have completely independent variant numbering schemes.

Very rarely, in special circumstances, you may be using an "Internal Release" version of a BACNAT component. Internal Release BACNAT components are normally only used within Global Business Systems for internal testing but may occasionally be released externally for informal evaluation, beta-tests or during the course of a problem investigation. Internal Release BACNAT components are not supported and are never generated by our Production Department although they may be available on the BBS from time-to-time. Internal Release BACNAT components are always referred to by a **lower-case version letter** (e.g. V4.3a, V1.11a etc.).

4.3 Controller and BACNAT variant 4.3

4.3.1 Global System Manager (BOS) V4.3 controllers

The V4.3 controller repackaging for Global System Manager (BOS) includes the following features:

- The ARCNET LAN controller section of the A.J5 action file has been simplified to remove some spurious prompts for those parameters that can be determined automatically by the controller software. Firstly, the prompt for the Interrupt Vector, which can always be deduced from the Interrupt Channel, has been removed. Secondly, prompts for the Interrupt Mask Register and Command Register, which can always be deduced from the Base Port Address, have been removed;
- The AHA-TAPE and AIC6360 Tape controller sections of the A.J5 action file have been modified to include the following prompt:

No filemark mode required?

thus allowing the \$TAPE No Filemark Mode to be established in the configuration file. Note that the AIC6360 controller was introduced in July-1995 and is fully described in Global Technical Bulletin GT765 (4-July-1995);

- The prompt for the Smartport card address has been changed to emphasise that it is an I/O address (not a memory address);
- A new controller, DISKPART, has been added to the Direct Access controller section of the A.J5 action file. The DISKPART controller (+J5CA14) is based on the "traditional" DISK controller (+J5CA04) but includes additional code to allow a specific DOS partition to be used by Global System Manager thus allowing a more precise disk-partitioning scheme than the disk partitioning option available with the "traditional" DISK controller. For example, to specify that the 2nd DOS partition is to be used by Global System Manager:

```
CONTROLLER (      ):DISKPART  Partitioned hard disk
DESCRIPTION: 2nd MS-DOS partition on 1st disk
Dynamic size of disk
    0 = Use configuration file
    1 = determine at bootstrap time ( 1):1
BOS partition start track ( 1):1
Partitioning scheme
    0 = No partition map
    1 = DOS partition map
    2 = GSM partition map    ( 0):1
Partition Number           ( 0):2
```

A partition scheme of 2 is reserved for future use and should NOT be used.

- Both the "traditional" DISK controller and the new DISKPART controller include an option to cause the controller to map non-retryable NOT READY errors (result code "U") to retryable READ/WRITE errors (result code -1). This option is enabled by replying "Y" to the following prompt:

Retry NOT READY errors?

- A new controller, SERIAL, has been added to the Console controller section of the A.J5 action file. This controller is reserved for future use and should NOT be used;
- The +J5NINT Interrupt Controller has been improved to always dynamically relocate itself to high memory thus freeing some memory in the 64Kb nucleus segment. The +J5NINT module now indicates to the interrupt-driven Global System Manager serial controllers (e.g. serial screen, serial printer and SPD controllers) which interrupt vectors have been initialised and thus, may be used by Global System Manager. In addition, the V4.3 +J5NINT module now correctly handles interrupts caused by Receive Errors;
- An alternative Interrupt Handler, +J5NINS, may be used instead of +J5NINT. The new +J5NINS only initialises the interrupt vectors for IRQ-3 and IRQ-4. To employ +J5NINS instead than +J5NINT, use Global Configurator to modify the Nucleus Section of the configuration file as follows:

Serial Interrupt module (INT):INS

- The +J5NEXT Extended Memory handler now uses a standard BIOS call to determine the amount of extended memory available. This module has been tested with 32Mb of extended memory;
- A new diagnostic module, +J5NTEST, is provided to test extended memory. This module should only be used if advised by the Service Centre;
- The +J5NTRAP diagnostic module has been improved to dynamically relocate itself to high memory;
- The +J5NADA Adaptec nucleus component has been improved to release redundant code in the nucleus segment if a DEVICE ERROR is reported;
- The +J5NHYP Hyperport nucleus component has been improved to allow the Global Windows Workstation to obtain the name of the currently executing program;
- The +J5NMXP Synchronous protocol module, for use with the Hyper/MX sub-system, has been re-released to include the 5.2x/2.2e protocol routines as supplied by Technology Concepts Ltd (TCL). This version of the protocol modules includes better error correction (to fix a problem that occurs with noisy lines when non-error-correcting modems are employed) and support for ISDN lines. The ISDN options are enabled using the =.NNNN customisation utility (see below). Due to an internal restriction, the ISDN option is only allowed for the first two Hyper/MX cards in a multiple card configuration. Also, if card-1 is configured as an "ISDN Hyper/MX" then card-3 cannot be a Hyper/MX; and if card-2 is configured as an "ISDN Hyper/MX" then card-4 cannot be a Hyper/MX;
- The +J5NASP Asynchronous protocol module, for use with the PCC/8i, PCC/16i and Superport sub-systems, has been re-released to include the 5.2v protocol routines as supplied by Technology Concepts Ltd (TCL);
- The bootstrap modules for diskettes (+J5R01), BIOS hard-disks (+J5R04)

and Adaptec SCSI hard-disks (+J5R09) have been modified to increase the size of the nucleus segment from 63360 bytes to a full 64Kb;

- The ARCNET LAN controller (+J5CF02) has been modified to deduce the Interrupt Vector address from the Interrupt Channel, and the addresses of the Interrupt Mask Register and Command Register from the Base Port Address. The controller also validates the configuration file parameters and will return an error "C" in the following circumstances:
 - if the Interrupt Channel is not in the range 2 to 7, inclusive;
 - if the last digit of the Base Port Address is not 0;
 - if the Reset Port Address is not of the form xxx0, xxx5 or xxx8.

The V4.3 ARCNET controller returns an error "D", rather than an error "H", if the Arcnet card cannot be detected.

The ARCNET controller supports several types of Arcnet cards:

- SMC ARCNET-PC (and other members of the SMC 8-bit I/O mapped ISA family of Arcnet cards);
- DSP ARC-200 (8-bit memory-mapped ISA bus card);
- DSP ARC-260 (8-bit I/O mapped ISA bus card);
- SMC PS-310 (8-bit I/O mapped MCA bus card).

The pre-V4.3 variant of this controller attempted to determine the actual card type dynamically before performing a "card reset" operation. This heuristic approach caused a problem with some cards, the SMC PS-310 card in particular, which resulted in immediate and unrecoverable NETWORK ERRORS. The initialisation code of this controller has been improved to use the value of the Software Reset Port as a flag to indicate the card type (for those cards that have exhibited problems):

- if the Software Reset Port is xxx5 the controller will assume an SMC PS-310 card;
- if the Software Reset Port is xxx0 the controller will assume a DSP ARC-200 card;
- if the Software Reset Port is xxx8 the controller will attempt to determine the card type and reset the card using the pre-V4.3 compatible algorithm.

Furthermore, the ARCNET controller includes a diagnostic option to display details of the network activity on the status line of the integral screen. This diagnostic option is enabled, on a colour screen, by means of the following tailoring zap:

```
ZZZZZZ
GVWYZN
GZGNZS
HGYJJF
```

GYFJYR
 QJXHYZ
 VMJNHT
 DZTDSY

- The CONSOLE integral screen console controller (+J5CB01) has been enhanced to allow multiple CONSOLE controllers to be defined in the configuration file thus allowing more than 9 partitions to be defined on an integral screen. A particular virtual screen is selected by keying <ALT><Fn>. A particular partition, within the current virtual screen, is selected by keying <ALT><n>.

A problem which causes a computer crash if the prefix-key is used has been fixed.

Support for the obsolete Triumph-Adler keyboard (language type 8) has been removed;

- The DISK hard disk controller (+J5CA04) now recognises a new flag in the configuration file which allows non-retryable NOT READY errors to be mapped to retryable READ/WRITE errors. The introduction of this option should remove the necessity to zap the controller to cause NOT READY errors to be retried. The hard-disk controller also maintains a count of Read and Write operations;
- The TTY serial console controller (+J5CB02) has been upgraded to operate with the "high memory" version of the +J5NINT module (see above). If the V4.3 +J5NINT module is being used the variant of +J5CB02 MUST be V4.3, or later. This compatibility issue should never arise in practice because the +J5NINT and +J5CB02 modules should always remain in step within the same nucleus library;
- The S.PRINT serial printer controller (+J5CE02) has been upgraded to operate with the "high memory" version of the +J5NINT module (see above). If the V4.3 +J5NINT module is being used the variant of +J5CE02 MUST be V4.3, or later. This compatibility issue should never arise in practice because the +J5NINT and +J5CE02 modules should always remain in step within the same nucleus library;
- The Serial Port Driver (%.J5S03) has been upgraded to operate with the "high memory" version of the +J5NINT module (see above). If the V4.3 +J5NINT module is being used the variant of %.J5S03 MUST be V4.3 (dated 01/01/96), or later.

The SPD handler now supports a new operation (SPOPC = 9) which returns the variant number in SPVERS and a revision number in SPRVSN. Both SPVERS and SPRVSN are newly defined fields in the SP-block.

Furthermore, the SPD module now restores a serial port for re-use as a serial screen. This feature allows a particular COM port, configured as a TTY serial console, to be used by an SPD application, then re-used as a serial console, once the application has unloaded the Serial Port Driver;

- A new serial console controller SERIAL (+J5CB10) is distributed with Global System Manager. This module is reserved for future use and should NOT be used;
- The IBM PC customisation utility (= .NNNN, where NNNN is the

configuration code, for example 5700) has been enhanced to prompt for a single configuration file. Previous versions of this utility operated on ALL the configuration files on a SYSRES volume.

The Memory Customisation option indicates that all memory addresses are in unit of kilobytes (Kb). Furthermore, the Memory Customisation option of =.NNNN automatically updates the nucleus RSA and CSA fields according to the RAM disk/cache allocation thus removing the requirement to run the "RAM Disk/Cache" option in the Configuration Maintenance option of \$CUS.

The "Hyperport Customisation" option of =.NNNN allows a Hyper/MX line to be marked as an "ISDN line" and allows an Inactivity Timeout and a Reconnect Timeout to be associated with that line. For example:

```
Line-0 drop connection if inactive (N)?:Y
Line-0 timeout position [0=local,1=remote] (0):
Line-0 inactivity timeout in seconds ( 0):
Line-0 connect timeout in seconds ( 0):
```

4.3.2 Global System Manager (MS-DOS and Windows) V4.3 controllers and BACNAT

In addition to the changes described above, replacing "J5" by "JW" as appropriate, the V4.3 controller and BACNAT repackaging for Global System Manager (MS-DOS and Windows) includes the following features:

- In addition to the changes to the AHA-TAPE and AIC6360 tape controllers described above, the ASPI Tape controller section of the A.JW action file has been modified to include the following prompt:

```
No filemark mode required?
```

thus allowing the \$TAPE No Filemark Mode to be established in the configuration file. Note that the ASPI controller was introduced in July-1995 and is fully described in Global Technical Bulletin GT765 (4-July-1995);

- The following prompt in the DOS.PRI printer controller section of the A.JW action file:

```
Open device in raw mode?
```

has been replaced by:

```
Printer mode byte
#01  Open file in raw mode
#02  Polled mode for devices
#04  Use <CR><LF> for
      non-hardware form feeds (#00)
```

The new options available in the DOS.PRI controller are described below;

- GSMLOAD.EXE recognises a new option in the GSM.INI file which allows the number of MS-DOS File Handles to be specified. This option allows the number of MS-DOS File Handles available for subsequent use by Global System Manager to be increased from the default value of 20 up to the limit defined by the "FILES" option in the CONFIG.SYS file.

To specify the number of File Handles, include the following line in the GSM.INI file:

```
HANDLES nn
```

For example, to set the number of File Handles for use by Global System Manager to 40, use the following line:

```
HANDLES 40
```

Note the important difference between the new HANDLES option and the existing SSD-HANDLE option. The HANDLES option actively **sets** the number of available MS-DOS File Handles to a specific value. Whereas the SSD-HANDLE option merely limits the number of File Handles that are **used** by the +JWCAOC controller (as explained in section 7.1.6 of the Global Operating Manual (MS-DOS and Windows));

- GSMLOAD.EXE now recognises standard MS-DOS command line arguments (i.e. a single alphabetic character prefixed with a leading slash). For example:

```
/D prevent screen clear before returning to MS-DOS (useful when
    bootstrap diagnostics are
    enabled);
```

```
/S enable diskette drive swapping;
```

```
/W indicate that Global System Manager is being initiated under
    Microsoft Windows.
```

- The defaults for Expanded and Extended memory in the default GSMBOOT.PIF file have been modified to reflect the higher importance of the XMS memory handler over the (obsolete) LIM memory controller.

Furthermore, the Background Priority in the PIF has been increased from 50 to 100. This change has been implemented to facilitate the installation and use of the Global Windows Workstation (GUI);

- GSMLOAD.EXE now de-allocates LIM and XMS correctly if the load of Global System Manager fails when the "D" diagnostic option is enabled;
- GSMLOAD.EXE now intercepts the "Break" interrupt vector to prevent users from inadvertently returning to MS-DOS by keying <CTRL C>;
- The bug in GLDDINF.EXE that causes it to display the disk size (and other information) of high capacity disks as a negative number, has been fixed;
- The GLENDDF.EXE utility has been enhanced to allow a sub-volume to be increased by a fixed amount (+NNNN) or multiplied by a fixed amount (*NN). For example, to increase the size of a sub-volume file by 1Mb use the following dialogue:

```
C:\GSM>GLENDDF GSM200
```

```
GLENDDF - Enlarge Discrete Data Files.
```

```
Discrete data file name (<CR> to scan):<CR>
10SLDATA.SVL:Y
```

Current file size is 1024K
 New file size:+1M

For example, to double the size of a sub-volume file, use the following dialogue:

C:\GSM>GLENDDF GSM200

GLENDDF - Enlarge Discrete Data Files.

Discrete data file name (<CR> to scan):<CR>
 10SLDATA.SVL:Y
 Current file size is 1024K
 New file size:*2

Furthermore, the GLENDDF.EXE utility has been improved to always ensure the size of the "enlarged" sub-volume file is always an exact multiple of the logical track size (e.g. 32Kb for volume format T259Z). Earlier versions of GLENDDF.EXE, merely incremented the size of the sub-volume file without validating the size of the new file;

- A new utility, GLUPDDF.EXE, is provided which UPgrades the contents of a "T151Z" format Discrete DataFile (i.e. SSD) directory to "T259Z" by enlarging the size of the header file from 32Kb to 64Kb and preserves the existing Long Volume Descriptions. **Important note:** This utility has been provided to facilitate the upgrade of existing installations to Global System manager V8.1. If this utility is used, the bootstrap information in the existing OOSYSDOM.SVL header file will be lost and must be re-applied by re-installing Global System Manager;
- GSMLOAD.EXE has been upgraded to optionally load the Btrieve Universal Channel Interface (UCI) overlay module, UCILOAD.OVL. This option is required in order to access Btrieve format ISAM files or Btrieve format DMAM databases. **THIS OPTION, WHICH IS NOT FOR GENERAL-USE AND WHICH SHOULD ONLY BE USED FOR SPECIALISED, BESPOKE APPLICATIONS, IS NOT USED TO ACCESS BTRIEVE FORMAT SPEEDBASE DATABASES (SEE BELOW).**

To enable this option, the following keywords must be defined in the GSM.INI file:

UCI xxxx BUFFER yyyy CHANNELS zzzz

where xxxx is the maximum number of Btrieve UCI file channels that can be opened at the same time (these logical channels are held in XMS memory), yyyy is the size of the database record buffer, and hence must be set to the size of the largest DMAM or ISAM record that will be accessed via the UCI, zzzz is the number of UCI file channels held in conventional memory. The amount of memory required for the UCI channels is as follows:

Conventional memory: zzzz * (yyyy + 4Kb)

XMS memory: xxxx * (yyyy + 4Kb)

- The RTC clock nucleus component, +JWNSV9, detects if Global System Manager is running under Microsoft Windows (i.e. if the "W" switch was used in the GSMLOAD command line). If the "W" switch was used to initiate Global System Manager, the RTC is always used to update the Global System Manager clock regardless of the setting of the following flag in the configuration file:

Use RTC for clock update?

In addition, a bug that caused the Global System Manager time to be approximately twice the MS-DOS time (e.g. 8:00am rather than 4:00am) has been fixed;

- The SSD-FILE direct-access controller (+JWCA0C) has been improved in several areas.

Extra validation has been included to ensure the volume format ANA code (see Appendix G of the V8.1 Global Configurator Manual) defined in the configuration file starts with a "T" (obscure problems can occur if the SSD-FILE controller is used in conjunction with a "P" format code).

The calculation that determines the amount of spare space on the logical volume now works correctly when the cluster size is 64Kb. This problem is only likely to occur when a hard-disk on a Novell file-server is being accessed directly (i.e. by-passing the Global System Manager NLM).

The total logical disk size is set to the maximum size allowed by the volume format (i.e. 512Mb for formats T151Z and T224Z; 2Gb for volume format T259Z) in order to overcome a problem that can occur on disks with more than 64K clusters. Again, this problem is only likely to occur when a hard-disk on a Novell file-server is being accessed directly (i.e. by-passing the Global System Manager NLM).

The SSD-FILE controller now checks that each sub-volume file in the SSD directory is readable (i.e. can be opened in Read/Write mode). If the Open operation fails (e.g. the file has the MS-DOS Read-only attribute set) an ERROR Z will be reported when the domain is listed. Note that an ERROR Z will be displayed when listing a domain if any of the following error conditions occur:

- duplicate MS-DOS sub-volume files exist for a single sub-volume number;
- an MS-DOS sub-volume file is not a multiple of the track size (e.g. 32Kb for volume format T259Z);
- an MS-DOS sub-volume file cannot be opened in Read/Write mode.

In all cases, the invalid sub-volume will not be listed by either \$F, \$V or \$DIR.

Important note: If the SYSRES volume file (e.g. 01SYSRES.SVL) is read-only, the Global System Manager load will fail, returning immediately to the MS-DOS prompt. If the GSMLOAD.EXE "D" Switch is enabled, the following fatal error message will appear:

```
$57 INITIATION ERROR 10 - UNABLE TO LOAD P.$MON          201 K
```

- The DOS.PRI printer controller (+JWCE08) has been improved in several areas.

The bug that causes unpredictable errors when "raw" printing mode is

enabled, has been fixed.

The bug that causes Global System Manager printer units to be dynamically removed (with an initiation error "D") if the equivalent MS-DOS resource is a physical printer device or a text file (i.e. not an MS-DOS spool directory) AND the unit is not defined as one of the first three DOS.PRI entries in the GSM.INI file, has been fixed.

The DOS.PRI controller now recognises 2 extra bits in the Printer Mode Byte. The following bits are recognised:

- #01 if this bit is set the MS-DOS print device is opened in raw mode;
- #02 if this bit is set the DOS.PRI controller checks the state of the MS-DOS device before attempting to send a character to the printer in an attempt to improve the performance of the DOS.PRI controller. In practise, this option appears to have little, if any, effect on performance;
- #04 if this bit is clear the DOS.PRI controller will emulate a form-feed by the required number of <LF> characters. If this bit is set, the form-feed is emulated by the required number of <LF><CR> character pairs.

4.3.3 Global System Manager (Novell NetWare) V4.3 controllers and BACNAT

In addition to the two sets of changes described above, replacing "J5" by "JW" as appropriate, the V4.3 controller and BACNAT repackaging for Global System Manager (Novell NetWare) includes the following features:

- All Global System Manager (Novell NetWare) configuration files have been upgraded to include the option to install serial consoles. The SERIAL CONSOLES ATTACHED? flag is now set to "Y";
- The GLOBAL.BAT batch file now includes an option to run GSMWORK.BAT (i.e. rather than SMBOOT.BAT). This new option is enabled by use of the /W command line option;
- A bug that causes the DLV at unit address 110 to be removed if the GSMLOAD "S" switch is used has been fixed;
- The SVC-61 module, +JWNS61, includes a number of extra operations in preparation for the release of a version of Global System Manager PM that includes support for Btrieve format Speedbase databases;
- A new utility =.NOVELL is available to create a SYSIPL volume on the Novell file-server after the installation of Global System Manager from a work-station. The =.NOVELL job initiator will eventually replace the %.IPLJOB job (which will be withdrawn in a future release of Global System Manager). Unlike %.IPLJOB, =.NOVELL offers a default configuration filename and unit, copies the A.JW action file from SYSRES to SYSIPL (i.e. the A.JW file is copied to the same volume as the configuration file), customises the \$B and \$BA assignments to local units on the workstation, customises the \$IP assignment to the SYSIPL unit, and gives the operator the option to copy all nucleus files from the SYSRES volume to the nascent SYSIPL volume;
- The Global System Manager (Novell NetWare) customisation utility

(=.NNNN, where NNNN is the configuration code, for example 5613) has been enhanced to include an option to run the =.NOVELL utility (see above) directly;

- The SPX LAN controller (+JWCFOB) has been modified to include a diagnostic option to display details of the network activity on the status line of the integral screen. This diagnostic option is enabled, on a colour screen, by means of the following tailoring zap:

```
ZZZZZZ
GVWYZN
HNSDPZ
HGYJJF
HFPPRC
QJXHYZ
VMJNHT
FRSTLH
```

- The SPX remote Console controller (+JWCBOA) has been modified to recognise a newly defined flag in the configuration file to disable the "Watchdog Required Flag" when issuing "Listen For Connection" and "Establish Connection" requests. The option to prevent Watchdog Requests is enabled by setting the following flag in the configuration file to "N":

Enable SPX watchdog?

The option to prevent Watchdog Requests in the SPXWS.COM SPX Workstation is enabled by use of the /N command line parameter. Furthermore, the V4.3 SPXWS.COM explicitly closes the SPX socket upon termination.

4.4 Controller and BACNAT variant 4.4

4.4.1 Global System Manager (BOS) V4.4 controllers

The V4.4 controller repackaging for Global System Manager (BOS) includes the following features:

- The buffer allocation algorithm in the +J5NHYP module has been improved to allocate the printer buffers in high-memory. This change will fix the "unexpected dynamic printer removal" problem that occurs on those Hyperport family (i.e. Hyperport, Hyper/MX, PCC/8, PCC/16 and Superport) configurations that contain large numbers of screen and printers.

Furthermore, the buffer allocation algorithm has also been improved to prevent the problem that can occur when the printer buffers overwrite the area of memory reserved for console buffers. This problem normally results in a computer hang during bootstrap. If there is insufficient memory on the Hyperport family card to allocate the buffers required for a printer the device will be dynamically removed during the bootstrap (i.e. the printer unit will not appear in the \$U report) and the following bootstrap diagnostic message will appear:

```
$57 INITIATION WARNING   6 - FILE +J5CE60  ERROR S
```

The Hyperport module now includes a diagnostic option, enabled by the following tailoring zap (applied to +.J5), which displays the layout of the printer buffers on the Hyperport family card:

```
ZZZZZZ
GVWYZN
GZGWKH
HHRQGM
HLHRDC
QJWKXH
WZWSYM
QSCXSR
VMCLXN
FHFRBC
```

The diagnostics are displayed on channel-1 at 9600 baud.

A further problem in the +J5NHYP module that can cause unpredictable results (including computer crashes) on systems that include a TIS Hyperport card configured with 1Mb of RAM (instead of the normal 512Kb) has been fixed. This problem does NOT affect TIS Hyperport cards with 512Kb of RAM. This problem does NOT affect Hyper/MX, PCC/Ni or Superport configurations;

- The +J5CE60 and +J5NHYP modules have been modified to remove some superfluous, undocumented functionality;
- The V4.1 +J5NASP module has been incorporated into the V4.4 +.J5 library, replacing the V4.3 module. The problem with the V4.3 +J5NASP module that results in a spurious ERROR D with PCC/8 and PCC/16 cards (reference J0-3641) is still being investigated and has not been fixed;

- A new console controller, \$RLOGIN, has been added to the A.J5 Action File. This controller is reserved for future use: DO NOT ATTEMPT TO USE IT.

4.4.2 Global System Manager (MS-DOS and Windows) V4.4 controllers and BACNAT

In addition to the changes described above, replacing "J5" by "JW" as appropriate, the V4.4 controller and BACNAT repackaging for Global System Manager (MS-DOS and Windows) includes the following features:

- The SVC-61 module, +JWNS61, has been enhanced to include the interface required by the Speedbase Btrieve workstation software to communicate with the SPEEDBAS.NLM (see Appendix C). **The variant of the +JWNS61 module must be V4.4, or later, in order to access Btrieve format Speedbase databases from a workstation;**
- The SSD-FILE controller, +JWCA0C, includes an option (enabled by a zap) to display, on the status-line, the full MS-DOS extended error code from a failing Open operation. An error from the MS-DOS Open operation results in a Global System Manager ERROR K. In addition, the SSD-FILE controller includes an option to maintain a count of read/write operations and data lengths (although no external utilities are currently available to report on the information logged by the SSD-FILE controller);
- A small inefficiency in the +JWNAUT module when either the /D or /X GSMLOAD.EXE command line option is used, has been removed;
- A few cosmetic changes to the A.JW Action File have been made to remove misleading phrases such as "BOS" and "PC-DOS". A new console controller, \$RLOGIN, has been added to the A.JW Action File. A new network controller, EX-SPX, has been added to the A.JW Action File. These controllers are reserved for future use: DO NOT ATTEMPT TO USE THEM;
- A number of bugs in the Btrieve Universal Channel Interface (UCI) for DMAM, ISAM and RSAM have been fixed (DO NOT CONFUSE THE BTRIEVE UCI INTERFACE WITH THE SPEEDBASE BTRIEVE INTERFACE - SEE APPENDIX C). Problems in the various "partial key" operations have been fixed. A problem in the update-record-by-key functionality has been fixed. The problem that caused records larger than 1000 bytes to corrupt the end of the UCI control block has been fixed. The problem that caused a spurious EXIT 8801 on Open Shared operations has been fixed. The changes required for Btrieve Locking and Btrieve Owner Names have been implemented;
- GSMLOAD.EXE displays its variant number (and a full list of valid options) if the /? command line option is used. For example:

```
GSMLOAD /?
```

```
GSMLOAD.EXE V4.4
```

```
The following command line arguments are allowed:
```

```
[list of command line options/arguments]
```

- GSMLOAD.EXE recognises the /X command line option. This option sets an internal flag that is recognised by the Global System Manager (Novell NetWare) SPX LAN controller, +JWCFOB (see section 4.4.3,

below);

- The error messages displayed by GSMLOAD.EXE when a syntax error in the GSM.INI file is detected have been improved. Consecutive error messages are now displayed on separate lines (instead of on the same line). In addition to the standard error message, the invalid line in the GSM.INI file is displayed on the screen;
- The purpose of the GSMLOAD.EXE /D option is to enable a diagnostic mode. When this mode is enabled the screen clear that is normally performed immediately before Global System Manager relinquishes control back to MS-DOS is suppressed (see section 6.2.1.4 of the V8.1 Global Operating Manual (MS-DOS and Windows)). The /D is only useful when the configuration name has been renamed to end in a "D" to enable the bootstrap diagnostic option in the Steering Routine, +JOS000. In addition to the suppression of the screen clear, the V4.4 GSMLOAD.EXE sets an internal flag when the /D option is specified. This flag is recognised by the V8.1H Steering Routine to enable bootstrap diagnostics without the need to use \$F or \$DIR to rename the configuration file (see section 3.4);
- GSMLOAD.EXE has been enhanced to recognise a number of command line options that allow the run-time customisation that was only formerly available using MS-DOS environment variables (which are often difficult to establish in a Windows 3.1 or Windows 95 environment). The new options are:

/EC=string	Specify the configuration file name (e.g. /EC=++5623ZZ)
/ED=string	Specify the name of the Global directory (e.g. /ED=GSMTEST)
/EI=string	Specify the name of the GSM.INI file (e.g. /EI=GSMX.INI)
/EN=string	Specify the GSM (Novell NetWare) node-id (e.g. /EN=0x1b)
/EO=string	Specify the operator-id (e.g. /EO=AJU)
/ET=string	Specify the terminal-type (e.g. /ET=711)

- The GSMLOAD.EXE /I option has the effect of ignoring the "SPEEDBASE" line in the GSM.INI file. This is necessary to allow Global System Manager to be installed or re-installed without the requirement of running the SPEEDBAS.NLM on the file-server. For consistency, the "UCI" line in the GSM.INI file is also ignored if the /I option is used;
- A problem in GLENDDF.EXE when attempting to increase a sub-volume file that is not an exact multiple of the virtual track-size has been fixed;
- GLENDDF.EXE now recognises the /R command line option. When this option is supplied the sizes of all the sub-volume files in the specified domain directory are automatically rounded up, if necessary, to an exact multiple of the virtual track size. For example:

```
GLENDDF GSM200 /R
```

This option is expected to be particularly useful if sub-volume files are copied from a T151Z domain directory (i.e. virtual track size of 8Kb) to a T259Z domain directory (i.e. virtual track size of 32Kb).

4.4.3 Global System Manager (Novell NetWare) V4.4 controllers and BACNAT

In addition to the two sets of changes described above, replacing "J5" by "JW" as appropriate, the V4.4 controller and BACNAT repackaging for Global System Manager (Novell NetWare) includes the following features:

- The GSM NetWare Loadable Module (GSM.NLM) has been upgraded to variant V1.12 which supersedes the previously released V1.10 GSM.NLM (and the un-released V1.11 GSM.NLM).

GSM.NLM V1.12 includes the following features that were also included in GSM.NLM V1.11:

The NLM now returns the "Number of Files per Subvolume" allowing this information to be displayed by \$U when reporting details of simulated volumes on the File Server. The File Executive within GSM.NLM has been enhanced to check that the Number of files per volume on the simulated volume agrees with the Number of files per directory in the configuration file. The SSD-FILE controller within GSM.NLM now checks that the volume format in the configuration file starts with a "T" (e.g. T259Z) to prevent any attempt to use a "P" format in conjunction with an SSD-FILE controller. The SSD-FILE controller within GSM.NLM also checks that the size of the Domain Header file in an initialised SSD-FILE directory agrees with the volume format (e.g. T259Z) defined in the configuration file (see section 8.2.1.4 of the V8.1 Global Operating Manual (Novell NetWare)).

The details listed by the Diagnostics/GSM Data Files option on the GSM.NLM screen are now displayed in order of volume number to present the information in the same order as the equivalent \$U display on a workstation.

The problem that causes a spurious BUFFER WRITE ERROR when attempting to allocate sub-volumes (\$V) or reorganise domains (\$REORG) if GSM.NLM is used in conjunction with the V4.10f, or later, CLIB.NLM has been fixed.

The File Executive, LAN Executive and SSD-FILE controller within GSM.NLM have been enhanced to support the new operation (opcode 42) required by the \$V "Quick SSD Allocate" option (described in section 2.4). **Important note:** The "Quick SSD Allocate" option is expected to be of particular use when initialising a subvolume on a server running GSM.NLM from a workstation on a Novell NetWare network.

By default, whenever GSM.NLM is loaded a new log file (i.e. NLMGSM.LOG) is created, overwriting the existing NLMGSM.LOG file. This default behaviour can be modified, causing the NLM to append to an existing NLMGSM.LOG file, if the /A command line switch is used when loading the NLM. For example:

```
LOAD SYS:\GSM\GSM.NLM /A
```

As described in section 10.2.5.2.3 of the V8.1 Global Operating Manual (Novell NetWare) the contents of the NLMGSM.LOG file can be inspected using the Diagnostics/Log File option on the GSM.NLM Screen. **Important note:** Due to a limitation of the NetWare Server API functions, only the first 256 lines of the NLMGSM.LOG file can be inspected on the GSM.NLM Screen. If this limit is reached, the following warning messages will be displayed:

*** Cannot inspect further ***

However, this file is a normal MS-DOS text file and can be inspected using any standard MS-DOS text file inspection utility (e.g. MORE, EDIT) from a workstation.

If the SSD-FILE controller detects the size of a sub-volume file (e.g. 01SYSRES.SVL) is not an exact multiple of the virtual track size, the error is logged in the NLMGSM.LOG file thus allowing the cause of the missing sub-volume and the ERROR Z that occurs when listing the domain to be rapidly identified. Similarly, if the SSD-FILE controller detects multiple sub-volume files with the same unit number (e.g. 10SLDATA.SVL and 10PLDATA.SVL), the error is logged in the NLMGSM.LOG file thus allowing the cause of the missing sub-volume and the ERROR Z that occurs when listing the domain to be rapidly identified. Note that the V1.11, and later, GSM.NLM no longer remove the entire domain (resulting in errors such as PLEASE MOUNT SYSRES ON A01) if subvolume files with the same unit number are present in the domain directory.

The GSM.NLM diagnostics options have been enhanced to include 2 more levels of diagnostics. The Diagnostics/Advanced Diagnostics/FD Diagnostics option allows the basic File Executive operations to be captured on a log file (NLMFDLOG.LOG). The Diagnostics/Advanced Diagnostics/Packet Diagnostics option allows the low-level SPX packet information to be captured to a log file (NLMBIN.LOG). These highly specialised options, details of which are beyond the scope of this document, should only be enabled if advised to do so by Global Business Systems support or development staff.

GSM.NLM now reports an ERROR Z, instead of a WRITE ERROR, (and writes a record to the NLMGSM.LOG log file) if an attempt to allocate a new subvolume (using \$V) fails because a subvolume file with the same name as the nascent file has been copied to the Domain Directory using MS-DOS copy, for example, while the NLM is running. The NLM's internal table of the Domain Directory is only constructed while the NLM is loaded - modifying this directory using MS-DOS or Windows commands which by-pass the NLM, can produce unexpected results (most of which are reported as ERROR Z on the domain).

GSM.NLM V1.12 includes the following features that were not included in GSM.NLM V1.11: If the technique described in sections 10.2.5.3.1 and 10.2.5.5 of the Global Operating Manual V8.1 (Novell NetWare) is used to remove (i.e. delete) a connection, the event is logged in the NLMGSM.LOG file.

The V1.12 NLM recognises the /C command line option. For example:

```
C:\GSM\GSM.NLM /C
```

If this option is specified then whenever the NLM detects that an SPX connection has been lost all the files currently marked as open for the disconnected workstation are automatically closed. This should result in the automatic closure of the Swap File (e.g. \$\$SWAP1B) and will prevent the SWAP FILE IN USE (ERROR F) condition that normally occurs if Global System Manager is reloaded on a workstation that has crashed while Global System Manager was running.

The V1.12 NLM also allows the name of the NLM .INI file to be specified

as a command line argument (over-riding the default NLMGSM.INI file).
For example:

```
C:\GSM\GSM.NLM NLMGSM-B.INI
```

Note that a suggestion to display the full command line that was used to initiate GSM.NLM has not been implemented. The purpose of this suggestion was to provide the full pathname of the NLM. This information can be easily deduced from full pathname of the log filename which is displayed by the Diagnostics/Log File option on the NLM main screen as described in section 10.2.5.2.3 of the V8.1 Global Operating Manual (Novell NetWare);

- The SPXWS.COM terminal emulator now recognises the /X command line option. For example:

```
SPXWS 1 E8 9001 /X
```

If the /X option is used, a hexadecimal dump of the main SPX control blocks will be displayed on the screen while the terminal emulator is attempting to connect to the specified host.

The following error message is displayed by SPXWS.COM if the "host address" is identical to the internetwork address of the workstation computer (the most common error reported when using SPXWS.COM):

```
Source address = Dstn address
```

- GSMLOAD.EXE has been upgraded to optionally load the Speedbase Btrieve workstation overlay module, SPEEDBAS.OVL. This option, which is fully described in section C.5, is required in order to access Btrieve format Speedbase databases. **Note to Speedbase Btrieve beta-testers:** The SPEEDBAS.OVL module (which is automatically invoked by GSMLOAD.EXE, see below) effectively replaces the GLHOOK.EXE aka GLCLIENT.EXE modules);
- The Speedbase Btrieve NetWare Loadable Module (SPEEDBAS.NLM) is distributed on the Global System Manager (Novell NetWare) BACNAT diskette. This NLM, and Speedbase Btrieve in general, are fully documented in Appendix C.

Important note: Due to space restrictions, the following files, which are only required for Novell NetWare V3.11, are no longer distributed on the BACNAT diskette:

```
CLIB.311
GSM311.NLM
```

The files are available for down-loading on the BBS;

- The problem that causes Global System Manager (Novell NetWare) workstations to hang unexpectedly during network access has been fixed. This problem, which occurs very readily when the server contains a fast PCI-bus or EISA-bus ethernet card, was referred to as the "PCI card problem". However, this problem is not just restricted to ISA-bus cards and has also been reported (and fixed) on a network containing ISA bus cards with Windows 95 workstations;
- The Novell NetWare workstation LAN Executive, +JWEF01, has been

enhanced to support the new operation (opcode 42) required by the \$V "Quick SSD Allocate" option (described in section 2.4). **Important note:** The "Quick SSD Allocate" option is expected to be of particular use when initialising a subvolume on a server running GSM.NLM from a workstation on a Novell NetWare network;

- The diagnostic option in the SPX LAN controller, +JWCFOB, that was introduced with the V4.3 variant can now be enabled by specifying the /X option to the GSMLOAD.EXE command line. For example:

```
GSMLOAD.EXE  GSMIPL.VOL  /N  /X
```

Prior to V4.4 +JWCFOB, this diagnostic option could only be enabled by means of a tailoring zap to the +JWCFOB controller.

Note that an alternative SPX LAN controller, +JWCFOC, is included in the +.JWNLM library. This controller is reserved for future use. DO NOT ATTEMPT TO USE IT;

- In addition to the changes to A.JW described in section 4.4.2, the NET.PRI controller section has been enhanced to include the following extra prompts:

```
Printer class:
  0 = DO NOT USE
  1 = Intelligent NET.PRI
  2 = Non-intelligent NET.PRI
 >2 = RESERVED FOR FUTURE USE
Specify Printer Class      (  1):
Flush Queue Timeout in secs (  0):
```

This Printer Class should be set to 1 (the default) to maintain compatibility with the pre- V4.4 NET.PRI controller. Only set the Printer Class to 2 if you have applied zap Z.WCE084 to remove the "intelligence" from the V4.3 NET.PRI controller (i.e. to effectively turn the "intelligent" NET.PRI controller into a "non-intelligent" DOS.PRI controller that recognises NetWare print queues). All other values for the NET.PRI Printer Class are invalid and will cause unpredictable results.

Only set the Flush Queue Timeout to a non-zero value if you require the NET.PRI controller to automatically flush the queue buffer after a period of inactivity (e.g. to force the printing of an alignment pattern). Because this option complements the use of a TIMEOUT parameter in the NET.PRI definition in the GSM.INI file, the Flush Queue Timeout should only be set to a nonzero value if the corresponding NET.PRI TIMEOUT value is 0;

- The NET.PRI printer controller, +JWCE08, has been enhanced to recognise the Printer Class and the Flush Queue Timeout options described above.

4.5 Controller and BACNAT variant 4.5

4.5.1 Global System Manager (BOS) V4.5 controllers

The V4.5 controller repackaging for Global System Manager (BOS) includes the following features:

- The +J5NHYP Hyperport module has been repackaged to fix a problem introduced with the V4.4a controller that prevents the use of either the "TCLASYNC" or "TCLSYNC" controllers (although the equivalent "PCC/I" and "HYPERMX" controllers do not exhibit the problem);
- The Global System Manager (BOS) date/time module, %.J5D, has been repackaged to fix a problem that occurs when the default date, as supplied by the BIOS, is changed to a date in the 21st century (the code that writes 20th century dates (e.g. 2-Feb-1997) has also been modified to correct a long-standing bug that could potentially set the date to the 14th century (e.g. 2-Feb-1397) on some BIOS's). Note that the problem only occurs if the current date is changed. All dates in both the 20th and 21st centuries are read correctly. Note also that this problem only affects Global System Manager (BOS) configurations - there are no known problems with the Global System Manager (MS-DOS), Global System Manager (Novell NetWare), Global System Manager (Unix) or Global System Manager (Windows) date/time modules;
- The ARCNET LAN controller, +J5CF02, has been certified for use with both the SMC ARCNET-PC130 (see Global Technical Bulletin GT817, 25-November-1996) and SMC ARCNET-PC130E cards (see Global Technical Bulletin GT874, 18-September-98). Although no software changes were necessary to support the ARCNET-PC130 or ARCNET-PC130E cards with the "ARCNET" controller, the V4.5 +J5CF02 module also supports the "SMCPC130" controller. The "SMCPC130" controller allows the RAM address to be specified as a segment address thus allowing any of the addresses available on the PC130 card to be used. The "ARCNET" controller only allows a restricted range of addresses (on a 16Kb boundary) to be used whereas the "SMCPC130" controller allows any of the full range of addresses (on a 2Kb boundary) to be used;

To use this new option with an SMC ARCNET-PC130 or ARCNET-PC130E card use Global Configurator to replace the "ARCNET" controller by "SMCPC130". The following configuration-specific prompts will appear in addition to the standard prompts described in section 3.7 of the Global Configurator Manual:

```
Base port address           (#02E0):
Software reset port        (#02E8):
Interrupt channel          (    2):
Segment address of RAM buffer (#D000):
```

Important note-1: The options configured by switches S1 and S2 depend on the card type:

	Switch bank S1	Switch bank S2
PC130	Node-id	Memory address & I/O address
PC130E	Memory address & I/O address	Node-id

Important note-2: The PC130E card **must** be configured for "star" topology (i.e. NOT "bus" topology) by installing the single jumper labeled "STAR" which is located adjacent to the BNC connector.

- A new LAN controller, SMPC130, has been added to the A.J5 Action File (see above). A new printer controller, HYPERAUX, has been added to the A.J5 Action File. This printer controller is reserved for future use (see section 4.7.1);
- The IBM PC customisation utility (=NNNN, where NNNN is the configuration code, for example 5700) has been enhanced to allow the +J5NTEST module to be customised in the Diagnostic Customisation option;

In addition to these changes it should be noted that:

- The V4.3 TCL Hyper/MX controller, +J5NMX, has been certified for use with the TCL TwinSync card (see Global Technical Bulletin GT821). No software changes were necessary to support this card.

4.5.2 Global System Manager (MS-DOS and Windows) V4.5 controllers and BACNAT

In addition to the changes described above, replacing "J5" by "JW" as appropriate, the V4.5 controller and BACNAT repackaging for Global System Manager (MS-DOS and Windows) includes the following features:

- The Real Time Clock module, +JWNSV9, has been repackaged to fix a variety of problems that can occur when Global System Manager is running as a background task under Windows 3.1, 3.11 or Windows 95. The problems are likely to affect sites that are using the Global Windows Workstation (GUI) in "internal host" mode. The problems fixed are:
 - SUSPEND statements can take up to 40 times longer to time out than expected. This problem can affect processes that SUSPEND for short periods of time to allow a LOCK statement to be retried (e.g. the Speedbase PM locked record retry handling). Note that although a factor of 40 is the "worse case" we have encountered, a value between 8 and 10 would be typical;
 - Timeslices can last for 8 to 10 times longer than the normal 250msec to 500msec period customised on most configurations. A general latency and sluggishness effect is encountered especially just after swapping partitions on the GUI screen;
 - Timeouts can last for 8 to 10 times longer than expected. This can result in much increased printer NOT READY ERROR timeouts and will affect any applications that use the \$ATIM variable to perform an "Accept with Timeout".

In order for the fix to be effective, the "Use RTC for clock update" mode must be enabled either by specifying this option in the NUCLEUS SECTION of the configuration file or using the "W" or "/W" GSMLOAD.EXE command line argument;

- As explained above, the Global System Manager (MS-DOS) and Global System Manager (Novell NetWare) date/time module, %.JWD, has been fully tested with dates in the 21st century.

4.5.3 Global System Manager (Novell NetWare) V4.5 controllers and BACNAT

The V4.5 controller and BACNAT repackaging for Global System Manager (Novell NetWare) includes no new features in addition to the two sets of changes described above, replacing "J5" by "JW" as appropriate.

4.6 Controller and BACNAT variant 4.6

4.6.1 Global System Manager (BOS) V4.6 controllers

The V4.6 controller repackaging for Global System Manager (BOS) includes the following features:

- A new nucleus module, +J5NGLB, is now available to support the TCL GlobeServer i/o sub-system. The +J5NGLB module, which is effectively a replacement for the Hyper MX nucleus module, +J5NMXP, should be used in conjunction with the following controllers:

HYPERMx	Serial console on Hyper/MX or GlobeServer
TCLSYNC	Serial console on Hyper/MX or GlobeServer
HYPERMx	Serial printer on Hyper/MX or GlobeServer
HYPERMXP	Parallel printer on Hyper/MX or GlobeServer

To configure a GlobeServer system, process as for a Hyper/MX configuration (see section 3.4 of Hardware Factsheet Number 1). To indicate a GlobeServer sub-system (instead of a Hyper/MX sub-system) key "GLB" to the following new prompt in the NUCLEUS SECTION of the configuration file:

Load HyperMX/G.Server Module (MXP):

Details of the hardware settings for the TCL GlobeServer are fully described in the TCL "Hardware Installation Manual for the GlobeServer System".

Important Note-1: The reply to this prompt must be either GLB or MXP (in upper case). Global Configurator does not attempt to validate the reply to this prompt. If the reply is invalid, an Error 0008 will appear in the bootstrap messages when loading the +J5NHYP module. The GlobeServer is a replacement for the Hyper MX. In multi-card configurations it is NOT possible to mix the Hyper MX sub-system with the GlobeServer sub-system.

Important Note-2: See section 4.8.1 for details of an improvement to the GlobeServer implementation.

Important Note-3: Not all the hardware configurations described in the TCL documentation are supported by the Global System Manager drivers. The following table describes the possible configurations:

Line-1 Type	Line-1 Node(s)	Line-2 Type	Line-2 Nodes(s)	Allowed?
RS485	GS-1			Yes
RS422	GS-1			Yes
RS232A	GS-1			Yes
RS232S	GS-1			Yes
RS485	GS-1 GS-2			No
RS422	GS-1 GS-2			No
RS232A	GS-1 GS-2			No
RS232S	GS-1 GS-2			No
RS485	GS-1	RS485	GS-2	Yes
RS485	GS-1	RS422	GS-2	Yes
RS485	GS-1	RS232A	GS-2	Yes
RS485	GS-1	RS232S	GS-2	Yes

RS422	GS-1		RS485	GS-2	No
RS422	GS-1		RS422	GS-2	Yes
RS422	GS-1		RS232A	GS-2	No
RS422	GS-1		RS232S	GS-2	No
RS232A	GS-1		RS485	GS-2	No
RS232A	GS-1		RS422	GS-2	No
RS232A	GS-1		RS232A	GS-2	Yes
RS232A	GS-1		RS232S	GS-2	Yes
RS232S	GS-1		RS485	GS-2	No
RS232S	GS-1		RS422	GS-2	No
RS232S	GS-1		RS232A	GS-2	Yes
RS232S	GS-1		RS232S	GS-2	Yes
Any	GS-1	GS-2	Any	GS-3	No
RS485	GS-1	GS-3	RS485	GS-2	Yes
RS485	GS-1	GS-3	RS422	GS-2	Yes
RS485	GS-1	GS-3	RS232A	GS-2	Yes
RS485	GS-1	GS-3	RS232S	GS-2	Yes
RS422	GS-1	GS-3	RS485	GS-2	No
RS422/X-21	GS-1	GS-3	RS422	GS-2	Yes (X21 only not ISDN)
RS422	GS-1	GS-3	RS232A	GS-2	No
RS422	GS-1	GS-3	RS232S	GS-2	No
RS232A	GS-1	GS-3	Any	GS-2	No
RS232S	GS-1	GS-3	Any	GS-2	No
RS485	GS-1	GS-3	RS485	GS-2	GS-4 Yes
ISDN) RS485/X-21	GS-1	GS-3	RS422/X-21	GS-2	GS-4 Yes (X21 only, not
RS485	GS-1	GS-3	RS232A	GS-2	GS-4 No
RS485	GS-1	GS-3	RS232S	GS-2	GS-4 No
RS422	GS-1	GS-3	RS485	GS-2	GS-4 No
ISDN) RS422	GS-1	GS-3	RS422/X-21	GS-2	GS-4 Yes (X21 only, not
RS422	GS-1	GS-3	RS232A	GS-2	GS-4 No
RS422	GS-1	GS-3	RS232S	GS-2	GS-4 No
RS232A	GS-1	GS-3	Any	GS-2	GS-4 No
RS232S	GS-1	GS-3	Any	GS-2	GS-4 No

All other configurations, including configurations with more than 4 GlobeServer units, are invalid.

- The IBM PC customisation utility (= .NNNN, where NNNN is the configuration code, for example 5700) has been enhanced to allow a Hyper MX configuration to be customised to a GlobeServer configuration (and vice-versa). The following new prompt has been added for the "HyperMX" card type:

Hyper/MX or GlobeServer module (MXP):

Key GLB to specify a GlobeServer sub-system; or MPX to specify a Hyper MX sub-system;

- The TTY serial console controller, +J5CB02, has been improved:
 - Two new, high-speed baud-rates are allowed in the TTY section of the configuration file:

Baud-rate Value in configuration file

56K	57600
115K2	11520 (i.e. baud-rate divided by 10)

These baud-rates may not be supported on all COMn ports;

- Interrupt level IRQ-5 is now allowed in the TTY section of the configuration file. If this IRQ level is selected, the option to enable IRQ-5 in the NUCLEUS SECTION of the configuration file (see below) must be selected;
- The +J5CB02 controller now validates the Interrupt Vector table established by the V4.3, and later, +J5NINT module. An error "I" will be reported if the IRQ level specified for the serial console is not being handled by the +J5NINT module.
- The S.PRINT serial printer controller, +J5CE02, has been improved:
 - Two new, high-speed baud-rates are allowed in the S.PRINT section of the configuration file:

Baud-rate	Value in configuration file
56K	57600
115K2	11520 (i.e. baud-rate divided by 10)

These baud-rates may not be supported on all COMn ports;

- Interrupt level IRQ-5 is now allowed in the S.PRINT section of the configuration file. If this IRQ level is selected, the option to enable IRQ-5 in the NUCLEUS SECTION of the configuration file (see below) must be selected;
- The +J5CE02 controller now validates the Interrupt Vector table established by the V4.3, and later, +J5NINT module. An error "I" will be reported if the IRQ level specified for the serial printer is not being handled by the +J5NINT module.
- The Serial Interrupt Handler, +J5NINT, now supports Interrupt Level IRQ-5. This interrupt level was reserved for use by the Fixed Disk Adapter but is now usually available for other peripherals, including COM ports. The use of IRQ-5 is controlled by the following new flag in the NUCLEUS SECTION of the configuration file:

Extended interrupt flag byte

The following bits in this flag are defined:

Bit	Mask	Meaning
0	#01	0 = Use IRQ-7 only 1 = Use IRQ-5 instead of IRQ-7
1	#02	0 = Use IRQ-7 only 1 = Use IRQ-5 in addition to IRQ-7
2	#04	Reserved for future use
3	#08	Reserved for future use

4	#10	Reserved for future use
5	#20	Reserved for future use
6	#40	Reserved for PCI diagnostics (see below)
7	#80	Reserved for PCI diagnostics (see below)

Thus, the following hexadecimal values are allowed for the bottom nibble of the "Extended interrupt flag byte":

00	Use IRQ-7 only
01	Use IRQ-5 instead of IRQ-7
02	Use IRQ-5 in addition to IRQ-7
03	Undefined - do not use
04 to 0F	Reserved for future use - do not use

Note that a bit set to 1 in the new "Extended interrupt flag byte" has the effect of **enabling** IRQ-5, whereas a bit set to 1 in the existing "Interrupt mask byte" (formerly the "Interrupt mask flag") has the effect of **disabling** an IRQ level.

- The PCI-bus versions of the TCL CC/4B and TCL CC/8B multi-port serial i/o cards are now supported. To enable the "PCI aware" serial i/o interrupt handler replace the ISA-bus/MCA-bus interrupt handler module (i.e. +J5NINT) by +J5NPCI. This is achieved by replying PCI to the following prompt in the NUCLEUS SECTION of the configuration file:

Serial interrupt module (INT):

Note that +J5NPCI is a complete super-set of +J5NINT so that mixed PCI/ISA configurations are allowed.

Important note: Only the PCI-bus serial i/o cards supplied by TCL are supported by Global System Manager (BOS).

To configure a serial console connected to a PCI-bus CC/4B or CC/8B card specify the PCITTY console controller (instead of the normal TTY controller). The following configuration-specific prompts will appear:

```

PCI index number (from 0)
Channel number (from 1)
Baud rate
Attribute byte
Enable NS16550A FIFO

```

The "PCI index number" specifies a particular PCI-bus card in a configuration that includes several PCI-bus CC/4B or CC/8B cards. The "PCI index number" should be 0 for the only/first card; 1 for the second; and so on.

The "Channel number" specifies a particular channel on a CC/4B (i.e. 1 to 4) or CC/8B (i.e. 1 to 8) card. A value of 0 indicates that the lowest free channel is to be used.

The "Baud rate", "Attribute byte" and "Enable NS16550A FIFO" prompts are described in section 6.9.2.2.1 of the V8.1 Global Operating Manual (BOS). Note that the TCL CC/4B and CC/8B cards support the high-speed baud-rates (i.e. 56K and 115K2) described above.

When adding a PCITTY console controller, the following message will appear:

```
Set IRQ level to -1 for PCI (#FFFF)
```

Astute readers will realise that there is no requirement for a new console controller nucleus component (i.e. J5CBnn) - the combination of the new +J5NPCI and the existing +J5CB02 (added to the configuration file as "PCITTY", rather than "TTY") is sufficient to support serial consoles on the TCL PCI-bus serial cards.

To configure a serial printer connected to a PCI-bus CC/4B or CC/8B card specify the PCIPRI printer controller (instead of the normal S.PRINT controller). The following configuration-specific prompts will appear:

```
Baud rate
Device characteristics
PCI index number (from 0)
Channel number (from 1)
Extra attribute byte
```

The "PCI index number" specifies a particular PCI-bus card in a configuration that includes several PCI-bus CC/4B or CC/8B cards. The "PCI index number" should be 0 for the only/first card; 1 for the second; and so on.

The "Channel number" specifies a particular channel on a CC/4B (i.e. 1 to 4) or CC/8B (i.e. 1 to 8) card. A value of 0 indicates that the lowest free channel is to be used.

The "Baud rate", "Device characteristics" and "Extra attribute byte" prompts are described in section 6.9.2.2.2 of the V8.1 Global Operating Manual (BOS). Note that the TCL CC/4B and CC/8B cards support the high-speed baud-rates (i.e. 56K and 115K2) described above.

When adding a PCIPRI printer controller, the following message will appear:

```
Set IRQ level to -1 for PCI (#FFFF)
```

Astute readers will realise that there is no requirement for a new printer controller nucleus component (i.e. J5CEnn) - the combination of the new +J5NPCI and the existing +J5CE02 (added to the configuration file as "PCIPRI", rather than "S.PRINT") is sufficient to support serial printers on the TCL PCI-bus serial cards.

If the +J5NPCI controller detects a PCI-bus TCL CC/4B or CC/8B card on interrupt level IRQ-5, this interrupt level will be enabled automatically, regardless of the setting of the bottom 2 bits of the "Extended interrupt flag byte" (see above).

The top 2-bits of the "Extended interrupt flag byte" enable diagnostics within the +J5NPCI module:

Bit	Mask	Meaning
6	#40	0 = No wait after diagnostic line

1 = Wait for <CR> after displaying diagnostic line

7 #80 0 = PCI bus diagnostics displayed
 1 = PCI bus diagnostics enabled

Thus, the following hexadecimal values are allowed for the top nibble of the "Extended interrupt flag byte":

00	Diagnostics disabled
40	Invalid
80	Diagnostics enabled (no delay after each line)
C0	Diagnostics enabled (wait for <CR> after each line)
10 to 30	Reserved for future use - do not use
50 to 70	Reserved for future use - do not use
90 to B0	Reserved for future use - do not use
D0 to F0	Reserved for future use - do not use

4.6.2 Global System Manager (MS-DOS and Windows) V4.6 controllers and BACNAT

In addition to the changes described above, replacing "J5" by "JW" as appropriate, the V4.6 controller repackaging for Global System Manager (MS-DOS and Windows) includes the following features:

- The XMS Memory Handler, +JWNXMS, has been repackaged to fix a problem that causes a random address in high memory to be set to '0' leading to unpredictable results. For example, one manifestation of this problem is the corruption of the DOS keyboard translation tables resulting in the "c" character appearing as a '0'.

The Global System Manager (MS-DOS and Windows) BACNAT software has not been repackaged for nucleus variant V4.6.

4.6.3 Global System Manager (Novell NetWare) V4.6 controllers and BACNAT

The V4.6 controller repackaging for Global System Manager (Novell NetWare) includes no new features in addition to the two sets of changes described above, replacing "J5" by "JW" as appropriate.

Although the Global System Manager (Novell NetWare) BACNAT software has not been repackaged for nucleus variant V4.6, a new variant of the Speedbase Btrieve NLM (i.e SPEEDBAS.NLM V1.30) has been released. Refer to the Global System Manager (Novell NetWare) Configuration Notes (C5610) for further details.

4.7 Controller and BACNAT variant 4.7

4.7.1 Global System Manager (BOS) V4.7 controllers

The V4.7 controller repackaging for Global System Manager (BOS) includes the following features:

- The AHA-2940 family PCI SCSI host adapter card is now supported by Global System Manager (BOS). The following new components have been released to support the AHA-2940 family:

Module	Library	Description
+J5NA78	+.J5	AHA-2940 SCSI nucleus component
+J5CA0E	+.J5	AHA-2940 SCSI hard-disk controller
%.J5CT0C		AHA-2940 SCSI tape controller
+J5R0E	#.57nn	AHA-2940 SCSI bootstrap part-2
+J5B0E30	#.57nn	AHA-2940 SCSI bootstrap part-1

The following existing components have been enhanced to support the AHA-2940 family:

A.J5	Allows AIC7880 disk controller and AIC7880 tape controller to be added to an existing configuration file.
=.57nn	Allows a GSM (BOS) SCSI partition table to be created on a "large" (i.e. 2Gb, or larger) SCSI hard-disk accessed via the AIC7880 controller.

Perform the following steps to amend an existing configuration file to include a hard-disk or tape accessed via an AHA-2940 family card. Note that these steps are described in a "logical order" rather than the order of the CFUPDATE dialogue:

1). In the NUCLEUS SECTION of the configuration file:

```

AHA-154x or AHA-2940 SCSI card      Y
SCSI module (ADA or A78)           A78
Adaptec SCSI card I/O address      0000

```

In general, the reply to the 1st prompt should be "Y" if either an AHA-2940 or AHA-1540 family card is to be accessed by a GSM (BOS) hard-disk or tape controller. Note that if the GSM (BOS) nucleus includes only an AHA-1510 family card (for use only with \$TAPE) the reply to this prompt should be "N".

In general, the reply to the 2nd prompt should be:

```

AHA AHA-1540 family ISA or MCA SCSI host adapter card
A78  AHA-2940 family PCI SCSI host adapter card

```

All other values are reserved for future use.

If the "SCSI module" is AHA, the "Adaptec SCSI card I/O address" is described in section 6.1.4.2 of the Global Operating Manual (BOS). If the "SCSI module" is A78, the "Adaptec SCSI card I/O address" should be left at 0000.

Although only a single AHA-1540 family SCSI host adapter card can

be accessed directly addressed by GSM (BOS), up to 8 AHA-2940 family SCSI host adapter cards can be accessed directly by GSM (BOS).

Important note-1: It is not currently possible to mix AHA-1540 family and AHA-2940 controllers in a GSM (BOS) configuration.

Important note-2: The BIOS option on the AHA-2940 family SCSI host adapter card MUST be enabled.

- 2). Add a hard-disk controller in the DIRECT ACCESS CONTROLLER section of the configuration file:

```
CONTROLLER          AIC7880
DRIVE                0
Partition number    0
SCSIRATE value      FF
Base port address (high byte): 00
VOLUME FORMAT       P259Z
```

The DRIVE number should be set to the SCSI-id of the target hard-disk.

The "Partition number" allows SCSI hard-disks to be partitioned as described in sections 5.10 and 6.2.4.3 of the Global Operating Manual (BOS). The V4.7 =.57nn utility allows both ADAPTEC and AIC7880 hard-disks to be partitioned.

Important note: If a SCSI hard-disk is partitioned into several logical domains, a separate AIC7880 controller must be used for each partition. **DO NOT ADD MULTIPLE "P259Z" volume formats to a single AIC7880 controller entry.**

The "SCSIRATE value" is reserved for future use and should be left at the default of #FF.

The "Base port address (high byte)" should be set to the high-order byte of the i/o address of the AHA-2940 family SCSI host adapter card, if known. For example, if the AHA-2940 card is at I/O address #FC00, set this parameter to #FC. If the "Base port address" is between 0 to 7, the controller will scan the PCI bus to search for the N'th AHA-2940 card (or AHA-2940 compatible controller). AHA-2940 compatible devices are scanned in the following order:

```
On-board AIC7880
On-board AIC7870
On-board AIC7860
AIC7880 on PCI AHA-2940 family card
AIC7870 on PCI AHA-2940 family card
AIC7860 on PCI AHA-2940 family card
```

The VOLUME FORMAT must be P259Z.

- 3). To add a tape controller in the TAPE CONTROLLERS section of the configuration file:

```
CONTROLLER          AIC7880
Drive SCSI ID       6
SCSIRATE value      FF
```



```

Base port address (high byte)      00
Non-filemark mode required        N
Tape buffer length                 16384

```

The "Drive SCSI ID" number should be set to the SCSI-id of the target tape drive.

The "SCSIRATE value" is reserved for future use and should be left at the default of #FF.

The "Base port address (high byte)" is fully described above.

The "Non-filemark mode required" and "Tape buffer length" prompts are standard.

The "AIC7880" tape controller is only supported with \$TAPE V7.1. All the tape drives currently supported by \$TAPE V7.1 with the "ADAPTEC" controller (see Global Technical Bulletins GT-831 and GT-822) are supported by \$TAPE V7.1 with the AIC7880 controller;

- The =.PCIAHA diagnostic utility displays details of all the AHA-2940 family controllers on the PCI bus. This utility may be required to investigate PCI configuration problems;
- The =.PCITCL diagnostic utility displays details of all the TCL PCI CC/4 and CC/8 controllers on the PCI bus. This utility may be required to investigate PCI configuration problems;
- Auxiliary printing is now supported on all members of the Hyperport intelligent controller family (i.e. Hyperport, Hyper/MX, GlobeServer, Superport and PCC/Ni). A new controller, HYPERAUX, for Hyperport screens supplements the standard \$AUXPRI controller (see section 6.8 of the V8.1 Global Operating Manual (BOS)). All of the additional prompts described in section 6.8.1 will appear with the exception of the "Immediate error if displaying?" option, which is not supported by HYPERAUX; and the "Printing Mode" which can only be set to 1 or 2. If the Printing Mode is set to 1 auxiliary printing has a **higher** priority than normal console displays. If the Printing Mode is set to 2 auxiliary printing has a **lower** priority than normal console displays. The "Console Number" must specify a serial screen on a Hyperport family controller (i.e. HYPER, HYPERMX, PCC/I, TCLSYNC or TCLASYNC). If the "Console Number" is set to 0 the auxiliary printer is defined as a "floating" printer. For example, for a specific (i.e. "non-floating") controller, the following dialogue is typical:

```

CONTROLLER:                HYPERAUX
UNIT NUMBER :              502
DESCRIPTION:               Hyperport auxiliary printer
HARDWARE FORM FEED:       Y
MAXIMUM PAGE WIDTH:       132
TIME-OUT IN TENS OF SECONDS:  2
SPOOLER CONTROL BITS:     #00
PRINTER EXECUTIVE FLAG BYTE  #FF
Console number (from 1):    5
Screen type (1=PCWS,2=NyCE): 2
Printing mode (1 or 2):    2

```

For a "floating" controller, the following dialogue is typical:

```

CONTROLLER:                HYPERAUX

```

```
UNIT NUMBER:          510
DESCRIPTION:          Hyperport auxiliary printer
HARDWARE FORM FEED:  Y
MAXIMUM PAGE WIDTH:  132
TIME-OUT IN TENS OF SECONDS:  2
SPOOLER CONTROL BITS:  #00
PRINTER EXECUTIVE FLAG BYTE  #FF
Console number (from 1):      0
```

The V8.1H, or later, Printer Executive, +J0EE00, is required to support "floating" auxiliary printers on Hyperport family screens.

4.7.2 Global System Manager (MS-DOS and Windows) V4.7 controllers and BACNAT

The V4.7 controller and BACNAT repackaging for Global System Manager (MS-DOS and Windows) includes no new features in addition to the two sets of changes described above, replacing "J5" by "JW" as appropriate.

4.7.3 Global System Manager (Novell NetWare) V4.7 controllers and BACNAT

The V4.7 controller and BACNAT repackaging for Global System Manager (Novell NetWare) includes no new features in addition to the two sets of changes described above, replacing "J5" by "JW" as appropriate.

4.8 Controller and BACNAT variant 4.8

4.8.1 Global System Manager (BOS) V4.8 controllers

The V4.8 controller repackaging for Global System Manager (BOS) includes the following features:

- The +J5NHYP and +J5NASP modules have been upgraded to support the TCL DataServer-16 controller. The DataServer-16 is a direct replacement for the PCC/16i card and supports both serial consoles and serial printers. The +J5NASP module can now be used in conjunction with the following controllers:

DataServer-16	PCC/I	Serial console	on	PCC/8i,	PCC/16i,	Superport	or
DataServer-16	TCLASYNC	Serial console	on	PCC/8i,	PCC/16i,	Superport	or
DataServer-16	PCC/I	Serial printer	on	PCC/8i,	PCC/16i,	Superport	or

Details of the hardware settings for the TCL DataServer-16 are fully described in the TCL "Hardware Installation Manual for the DataPump, DataServer and TwinSync Programmable Communication Controllers".

Important note: Some DataServer-16 cards do not include details the various interrupt jumpers on jumper set LK3. When the card is viewed with the ISA bus slot at the bottom the interrupts selected by the pins in jumper set LK3, in left-to-right order are:

```
IRQ-15 (left-most)
IRQ-12
IRQ-11
IRQ-10
IRQ-9
IRQ-7
IRQ-5
IRQ-4
IRQ-3 (right-most)
```

- The +J5NGLB nucleus module, described in section 4.6.1, has been supplemented by the +J5NGLO nucleus module. Note that +J5NGLO, unlike +J5NGLB, can be used in conjunction with +J5NMXP in mixed GlobeServer and Hyper/MX configurations. The +J5NGLO module should be used in conjunction with the following controllers:

HYPERMXP	Serial console	on	GlobeServer
TCLSYNC	Serial console	on	GlobeServer
HYPERMXP	Serial printer	on	GlobeServer
HYPERMXP	Parallel printer	on	GlobeServer

The dialogue in the NUCLEUS SECTION of the configuration file has been modified to allow for the extra options. Firstly, the reply to the various "Card-N type" prompts can be any of:

Type	Description
0	Hyperport
1	Hyper/MX
1	GlobeServer (in homogenous configurations)
2	PCC/8I, PCC/16i, Superport or DataServer-16

3 GlobeServer (in mixed GlobeServer & Hyper/MX configurations)

Secondly, the following prompt will appear twice:

Load MXP, ASP, GLB or GLO:

This repeated prompt replaces the following pair of messages (in the pre-V4.6 A.J5):

Load PCC/I Module (ASP)
Load Hyper/MX module (MXP)

and the following message/prompt combination (in the V4.6 & V4.7 A.J5):

Load PCC/I Module (ASP)
Load HyperMX/G.Server module:

The new prompts that control the selection of the various nucleus modules now allow a wider range of modules. These new prompts allow up to 2 extra nucleus modules to be specified (in addition to +J5NHYP which is always loaded automatically for all configurations that include a member of the Hyperport family). The extra nucleus modules that must be specified depend on the card types according to a number of rules. In the description that follows the term "async card" refers to any of PCC/Ni, Superport or DataServer-16.

In general, up to 4 Hyperport family cards can be configured in a single PC. The "original" Hyperport cards (i.e. card type 0) don't require any extra nucleus modules and can be ignored when considering the names of the extra modules. There is no overhead involved in loading the extra modules: You are advised to leave the defaults as "ASP" and "MXP" unless the card configuration requires a non-default combination.

For card combinations that do not include any GlobeServers (e.g. single Hyper/MX or mixed Hyper/MX and Superport combinations) the 1st extra module should be "ASP" and the 2nd extra module should be "MXP" (i.e. the default options).

For card combinations that include one, or more, GlobeServers but no Hyper/MX's (e.g. single GlobeServer or mixed GlobeServer and Superport combinations) the 1st extra module should be "ASP" and the 2nd extra module should be "GLB". The card-type for the GlobeServer(s) should be set to 1.

For card combinations that include one, or more, GlobeServers and one, or more, Hyper/MX's **without** any "async" cards (with or without "original" Hyperports) the 1st extra module should be "MXP" and the 2nd extra module should be "GLO". The card-type for the GlobeServer(s) should be set to 3. The card-type for the Hyper/MX(s) should be set to 1.

For complex card combinations that include one, or more, GlobeServers and one, or more, Hyper/MX's **WITH** one, or more, "async" cards (with or without "original" Hyperports) a zap will be required. Please contact the Service Centre for further information.

To summarise:

Card combinations extra module	Card types	1 st extra module	2 nd
Hyperport only	0 only	ASP	MPX
Hyper/MX only	1 only	ASP	MPX
Async only	2 only	ASP	MPX
GlobeServer only	1 only	ASP	GLB
Hyperport & Hyper/MX	0 and 1	ASP	MPX
Hyperport & Async	0 and 2	ASP	MPX
Hyperport & GlobeServer	0 and 1	ASP	GLB
Hyper/MX & Async (with or without Hyperport)	1 and 2	ASP	MPX
GlobeServer & Async (with or without Hyperport)	1 and 2	ASP	GLB
Hyper/MX & GlobeServer without Async (with or without Hyperport)	1 and 3	MPX	GLO
Hyper/MX & GlobeServer Service Centre (with or without Hyperport)	& Async Zap required	- please contact the	

Important note: The module names (i.e. ASP, MPX, GLB and GLO) **MUST** be in upper-case.

- The IBM PC customisation utility (=NNNN, where NNNN is the configuration code, for example 5700) has been enhanced to allow the new +J5NGLO nucleus module to be included in an existing configuration. This utility sets the modules names to the correct values required for the card combination (as described in the table above).

4.8.2 Global System Manager (MS-DOS and Windows) V4.8 controllers and BACNAT

The V4.8 controller and BACNAT repackaging for Global System Manager (MS-DOS and Windows) includes no new features in addition to the two sets of changes described above, replacing "J5" by "JW" as appropriate.

4.8.3 Global System Manager (Novell NetWare) V4.8 controllers and BACNAT

The V4.8 controller and BACNAT repackaging for Global System Manager (Novell NetWare) includes no new features in addition to the two sets of changes described above, replacing "J5" by "JW" as appropriate.

During August 1998 the BACNAT software for Global System Manager (Novell) was revised to include updated versions of the following components:

Component	Version released in Aug-1998
-----------	------------------------------

GSM.NLM V1.18
 SPEEDBAS.NLM V1.56

The revised GSM.NLM includes the following features:

- A new option in the NLM Maintenance/Lock option displays full details of all outstanding shared locks;
- Changes to the messages displayed within the NLM Maintenance/Connections option when a workstation disconnects unexpectedly. These changes include the introduction of a new message when a workstation disconnects cleanly but leaves the \$\$USER file open;
- Improvements to the start-up code to improve the performance of the NetWare automatic file uncompress background process;
- Minor changes to display an event on the System Console when GSM.NLM is unloaded;
- Further minor changes to allow the NetWare Modules command to display the NLM version, creation date and copyright information;
- A fix to the bug that results in a spurious failed SYSTEM C0 message;
- GSM.NLM now writes a record to the NLM log file whenever one, or more, files are closed by the ACTIVITY-POLL processing.

The revised SPEEDBAS.NLM includes the following features:

- The option to hold Speedbase Btrieve databases in Btrieve 7.x format when using Pervasive SQL (aka Btrieve 7) is now supported. This option is also described in sections C.12 and D.11. Mixed Btrieve configurations (i.e. combinations of Btrieve 6.x and 7.x format databases) are supported.

Important note: Any site that is currently using an unofficial pre-V1.56 SPEEDBAS.NLM to access Btrieve 7.x format databases MUST rebuild all existing V7.x Btrieve format Speedbase databases immediately after installing the V1.56 SPEEDBAS.NLM: As soon as the V1.56 SPEEDBAS.NLM has been installed and loaded all V7.x Btrieve databases must be rebuilt, using \$BADN option 2, before any attempt is made to access the databases using a Speedbase application;

- The DDF files created by SPEEDBAS.NLM are now compatible with Pervasive (Btrieve 7) SQLScope. Note that versions of SPEEDBAS.NLM prior to V1.56 produced DDF files that could cause SQLScope to abend the server;
- A number of run-time options can be specified as run-time arguments to the SPEEDBAS.NLM Load command:

/A=0	Disable the "ARCSERVE Backup" option
/A=1	Enable the "ARCSERVE Backup" option
/F=0	Disable the "Fast Conversion Run" option
/F=1	Enable the "Fast Conversion Run" option
/S=0	Disable the "TLI Spin Waiting" option
/S=1	Enable the "TLI Spin Waiting" option

/D=nn Set the "Deadman Timeout" parameter to nn

- A serious problem, that results in severe database corruption when two, or more, (fast) database rebuilds and/or (fast) conversions are attempted simultaneously, has been fixed. This problem will only occur if the "Fast Rebuild/Conversion" option is enabled;
- The problem that could cause the sever to abend after an error 212, has been fixed;
- Two minor problems in the \$BADN Conversion option have been fixed: A PIC 9(6,2) COMP field is now correctly converted to a PIC 9(4,4) COMP field; the DDF entries for the input database of a conversion are not deleted if they will not be over-written by the output of the conversion run;
- A number of diagnostic messages were written directly to the server screen regardless of the setting of the "Debug Screen" diagnostic option. Messages from SPEEDBAS.NLM will only appear on the server screen if the "Debug Screen" option is enabled;
- SPEEDBAS.NLM supports a special diagnostic "echo" operation that is reserved for use by the SBANLM diagnostic utility. The SBANLM utility is supplied, in \$BBS file format (SBANLM.GSM), on the BACNAT diskette.

5. GSM (WINDOWS NT) BACNAT VARIANTS

This section describes repackages of the Global System Manager (Windows) BACNAT software.

5.1 GSM (Windows) BACNAT variants

The variant of a Global System Manager (Windows) BACNAT module can be determined from the About option of the Help menu on the main Global System Manager window.

BACNAT variants are normally independent of the revision of Global System Manager V8.1. Any exceptions to this rule are documented in the relevant section of this note.

In general, when a new variant of a BACNAT component is released the **variant number (n.n)** will be increased. Very rarely, in special circumstances, you may be using an "Internal Release" version of a BACNAT component. Internal Release BACNAT components are normally only used within Global Business Systems for internal testing but may occasionally be released externally for informal evaluation, beta-tests or during the course of a problem investigation. Internal Release BACNAT components are not supported and are never generated by our Production Department although they may be available on the BBS from time-to-time. Internal Release BACNAT components are always referred to by a **lower-case version letter** (e.g. V2.1m etc.).

5.2 GSM (Windows) BACNAT variant 2.2

The V2.2 BACNAT repackaging for Global System Manager (Windows) includes the following features:

- The Global Client GLOBAL.EXE module has been enhanced to include an RPC interface to the Speedbase Btrieve Gateway (SPEEDBAS.EXE). See Appendix D for a full description of the Speedbase Btrieve Gateway;
- The GLREGED.EXE Registry Editor utility has been enhanced to recognise the new sub-keys and ValueNames required by the Speedbase Btrieve Gateway. See sections D.4 and D.5 for a full description of the new Registry keys and ValueNames;
- The SETUP.EXE installation utility has been enhanced to allow the installation of a single Speedbase Btrieve Gateway and to establish the RPC connections between a Global Client and one, or more, Speedbase Btrieve Gateways. See sections D.4 and D.5 for a full description of the Speedbase Btrieve Gateway installation procedure;
- A new console controller, NETWORK, has been implemented to allow between 1 and 99 "thin clients" to be connected via a TCP/IP telnet protocol to a Global Client. The "thin client" terminal emulator must be the Global Windows Workstation (GUI) operating in "TCP/IP external host" mode. A "thin client" configuration will provide a considerable performance improvement over the traditional LAN "fat-client" configuration on low-bandwidth wide-area networks. A "thin-client" configuration may also outperform a "fat-client" configuration on small local area networks.

The terms "fat client" and "thin client" are best described by reference to a simple network consisting of a single "server" and one, or more, "workstations". In the "fat client" paradigm the Global Server process (i.e. GLSERVER.EXE) runs on the server; a separate "single-user" Global Client process (i.e. GLOBAL.EXE) runs on each of the workstations (the Global Clients are termed "single-user" because each configuration file includes a single GUI console controller). All processing is performed **locally** on each workstation. All access to shared files involves a **network** RPC request from the Global Client to the Global Server.

In the "thin client" paradigm both the Global Server (i.e. GLSERVER.EXE) and a "multi-user" Global Client (i.e. GLOBAL.EXE) run on the server (the Global Client is termed "multi-user" because one, or more, NETWORK console controllers (see below) augment the GUI console controller). Each workstation runs the Global Windows Workstation (GUI) to provide a network terminal emulator connecting to a TCP/IP socket created by the NETWORK console controller. All processing is performed **centrally** on the server. All access to shared files involves a **local** RPC request from the Global Client to the Global Server.

Any combination of "fat client" and "thin client" is possible. On a complex network configuration some workstations run the Global Client (i.e. GLOBAL.EXE) in "fat client" mode while other workstations run the Global Windows Workstation (i.e. GSMWIN.EXE) in "thin client" mode. Furthermore, although a standard "thin client" configuration will include a GUI console in addition to one, or more, NETWORK consoles, the GUI console is not mandatory and can be removed thus

allowing the GLOBAL.EXE process to effectively run as a "background terminal server". Note that if the GUI console controller is removed from the Global Client configuration file an empty Global window will still appear (change the properties of the Program Item/Shortcut to automatically run minimised).

Disk access in a "thin client" configuration can be improved by using the local RPC protocol (i.e. ncalrpc) instead of a network RPC protocol (e.g. ncacn_ip_tcp). This will maximise the data transfer rate between the Global Client and the Global Server running on the server computer. However, this option will prevent the Global Server from being accessed by any "fat clients" running on other computers on the network.

Disk access in a "thin client" configuration can be further improved by configuring a "local DDF" on the Global Client. Direct disk access from the Global Client is always faster than the RPC interface between a Global Client and Global Server. However, this option will also prevent the central data from being accessed by any "fat clients" running on other computers on the network (i.e. the Global Client running on the server cannot provide the server functionality to other Global Clients on the network).

To add a "thin client" console to an existing Global Client configuration use CFUPDATE to add a NETWORK controller in the USER DISPLAY ATTRIBUTES section of the Global Client configuration file (see section 8.3 of the V8.1 Global Operating Manual (Windows)). The TYPE AHEAD BUFFER LENGTH, DISPLAY BUFFER LENGTH, FUNCTION KEY BUFFER LENGTH, SCREEN IMAGE WIDTH, SCREEN IMAGE DEPTH, NUMBER OF STORED ATTR' BYTES, NUMBER OF VIRTUAL PARTITIONS, CHARACTER TRANSLATION ENABLED and CONSOLE EXECUTIVE FLAG BYTE are all described in section 2.4 of the V8.1 Global Configurator Manual. The "Screen Number" must match the following numeric sub-key in the Registry:

\$GLMACH\Client\Screens\Network\nn

where nn is a double-digit network console number between 01 and 99 (note that leading zeroes are mandatory for console numbers between 1 and 9).

The parameters specified by the following ValueNames under the:

\$GLMACH\Client\Screens\Network

sub-key of the Registry affect all NETWORK consoles:

ReceivePollDivisor This setting is fully described in section 8.3.2.2.1 of the V8.1 Global Operating Manual (Windows);

TransmitPollDivisor This setting is fully described in section 8.3.2.2.1 of the V8.1 Global Operating Manual (Windows).

The parameters specified by the following ValueNames under the:

\$GLMACH\Client\Screens\Network\nn

sub-key of the Registry only affect a single NETWORK console:

Port	This parameter allows the TCP/IP port number to be changed from the default of 23. The Global Windows Workstation (GUI) currently only attempts to open a TCP/IP socket on port number 23. Consequently, this option should not be used and is reserved for future use;
OperatorID	This 4 character string specifies the Global System Manager operator-id for the user accessing the network screen;
TerminalType	This 4 character string specifies the Global System Manager Terminal Type for the network screen (e.g. 711);
DisplayBufferSize	This value allows the size of the internal Display Buffer used by the NETWORK console controller to be altered from the default value of 512. Increasing the size of the display buffer may improve the "transmit character" performance of the NETWORK console controller under some circumstances.

- All Global System Manager (Windows) configuration files have been simplified to include just a single WINPRINT printer controller at unit address 500 (the configuration files released with the V2.1 BACNAT software contained a DOSPRINT controller (unit 500) and a WINPRINT controller (unit 501)). The SETUP.EXE installation utility has been modified to install a single WINPRINT sub-key in the Registry;
- The Global Client (GLOBAL.EXE) loader now closes the GL-IPL.DLV file once the start-up information has been read. This change allows multiple Global Clients to share the same GL-IPL.DLV file;
- The Global Client (GLOBAL.EXE) recognises the following new ValueNames under the:

\$GLMACH\Client

sub-key of the Registry:

MaximumMemory This value allows the amount of dynamic memory (in Mb's) allocated by the Global Client to be changed from the default value of 4Mb. This option is only required if very large multi-user configurations require a Global \$\$SWAPxx Swap File;

DisableHibernation Enabling this option prevents the GLOBAL.EXE process from relinquishing control to Windows NT (and will result in GLOBAL.EXE "hogging" all the CPU resources). This option should only be required in exceptional conditions when the Global Client is the only process running on the Windows NT computer.

- The bug that causes the Global Client to crash when <SYSREQ> . is key has been fixed. The <SYSREQ> . key combination is now ignored;

- The BACNAT variant (i.e. V2.2) is now displayed correctly by \$S;
- The obsolete \$.711 Terminal Attribute Program (TAP) that was distributed with the initial release of Global System Manager (Windows) has been replaced by the version which supports the 132-wide option;
- The Registry key handling in both the Global Client and the Global Server inverting the meaning of the "True" and "False" strings. Both processes now accurately honour the various options listed in section 7.2.1 of the V8.1 Global Operating Manual (Windows);
- A problem that caused a severe degradation in the performance of the Global Client when using terminal type 712 has been fixed by enabling the following new ValueName under the:

\$GLMACH\Client\Screens\GUI

sub-key of the Registry:

EnableStartAccept Enabling this option will reduce the performance overhead that may result if the default terminal type (i.e. 711) is changed to 712. If this option is enabled the screen is not updated for each character that is displayed. Instead, the screen is only updated when a Start Accept operation is initiated. This reduction in the frequency of screen refreshes can often result in improved overall performance.

- The "This will end your Global session prematurely..." Dialogue Box that appears when an attempt is made to close the Global Client without running \$BYE when using terminal type 711 now appears when terminal type 712 is used;
- A problem that caused the "pound symbol" to appear as a graphics box character when "pound-to-hash" translation was enabled (e.g. when terminal type 714 was being used) has been fixed;
- The server node-id (e.g. "A", "B" etc.) is displayed at the start of the server name when this text appears on the taskbar. This is to prevent the crucial server node-id information from disappearing when the Global server text is truncated on a crowded taskbar;
- The Global Client "GUI front-end" now explicitly loads the required text fonts from the DOSAPP.FON file. This modification fixes various screen and character corruption programs that were observed when a WideModeFont (or non-default NarrowModeFont) setting was used;
- A problem in the serial console controller that was responsible for random hangs, particularly when the serial interface involved copious XON/XOFF flow-control, has been fixed;
- It is now possible to include more than 9 serial consoles in a Global Client configuration. **THIS CHANGE HAS RESULTED IN AN INCOMPATIBLE CHANGE TO THE GLOBAL SECTION OF THE REGISTRY:** All single digit sub-

keys below the \$GLMACH\Client\Screens\Serial key must be prefixed with a leading zero. Although the SERIAL console controller will recognise single-digit sub-keys with or without a leading zero, the V2.2 GLREGED.EXE utility will not recognise single digit sub-keys without a leading zero (any such existing sub-keys can only be amended or deleted using REGEDIT.EXE or REGEDT32.EXE);

- A problem in the RPC interface, that could result in misleading error messages when attempting to access non-existent servers, has been fixed. Furthermore, an API error will be reported for all executive operations (including the Reset operation) if the DiagnosticDisplays option (see section 8.9.3 of the V8.1 Global Operating Manual (Windows)) is enabled. In addition, the problem in the V2.1i internal release BACNAT that resulted in an "Out of Resources" error when \$BYE is run, has been fixed;
- Both the DDF and IDF simulated volume controllers open the appropriate Windows files in "shared mode" thus allowing Global data files to be shared with other Windows applications (e.g. ODBC drivers);
- A problem in the WINPRINT printer handling, that caused the "Print Dialogue Box" to appear spuriously when the Windows printer name is defined in the Registry, has been fixed. A further problem that results in an API error (from the CGetMemory function) if no local Windows printers are available, has also been fixed. Furthermore, the problem that results in irrecoverable NOT READY errors, after a genuine NOT READY error, has been fixed;
- The Global Client (GLOBAL.EXE) now recognises the following new ValueNames under the:

\$GLMACH\Client\Printers\WinPrint\5nn

sub-key of the Registry:

Timeout This value allows a "close printer timeout" to be specified in seconds. Any value between 1 and 60 is allowed (a value of 0 implies no timeout). When the timeout period elapses the Windows printer is closed to allow Stationery Alignment patterns to be printed in real-time;

DisableValidation Enabling this option causes the WinPrint controller to ignore the validation of the printer name (see section 8.5.2.2 of the V8.1 Global Operating Manual (Windows)). This option is expected to be of use if access to a Windows printer that exists in another Windows domain or workgroup is required. This option will also be useful if the computer to which the printer is attached is not running Windows when the Global client is initiated.

Note that a network printer must be addressed using its "share name" (e.g. "\\tismdtpc\hp") under Windows NT; or its locally defined printer name (e.g. "\\tismdtpc\hp printer") under Windows 95;

- A problem in the DOSPRINT printer controller that caused the file-mode flags specified by the "CreateNew" and "LFToLFCR" value-names under

the:

\$GLMACH\Client\Printers\DOSPrint\5nn

sub-key of the Registry to be ignored, has been fixed;

- The Global Client has been enhanced to allow Global System Manager (Windows) to be installed from a post-box area on a hard-disk. This change is required for future enhancements that will allow Global System Manager to be installed from media other than diskettes;
- The Global Client (GLOBAL.EXE) now recognises the following new ValueNames under the:

\$GLMACH\Client\Screens\Serial\nn

sub-key of the Registry:

ImmediateInput Enabling this option **may** improve the "receive character" performance of the SERIAL console controller under some circumstances;

DisplayBufferSize This value allows the size of the internal Display Buffer used by the SERIAL console controller to be altered from the default value of 512. Increasing the size of the display buffer **may** improve the "transmit character" performance of the SERIAL console controller under some circumstances.

- The Global Client process has been enhanced to inform all the relevant Global Servers that a connection has been broken by an operator closing the client without running \$BYE. This closure is normally performed by clicking on the "close window box" and selecting the "OK" button in the Dialogue Box that appears. The effect of this change is that the "Global Client is already running" Dialogue Box should only appear when a genuine operator error has occurred (i.e. when an attempt is made to load more than one copy of the Global Client on a particular computer) and should not occur spuriously after a Global Client has been closed without running \$BYE. However, this change does not affect the status of the Global files that are flagged as "open by the Global Client" on a Global Server;
- The V8.1 Global Operating Manual (Windows) contains a number of serious errors. On page 2-11, the table of Protocols and Endpoints should be as follows (the changes to the published manual are embolden):

Protocol	Endpoint
LOC or ncalrpc	Free-format (but must not be blank)
TCP or ncacn_ip_tcp	1024 to 5000
SPX or ncacn_spx	32768 to 65535
ncacn_np	\pipe\pipe_name
ncadg_ip_udp	1024 to 5000
ncacn_nb_tcp	33 to 255
ncacn_nb_nb	33 to 255
ncadg_ipx	32768 to 65535

On page 2-16, the Address Format for the ncacn_nb_tcp and ncacn_nb_nb protocols should be the "server name" and not <blank>.

5.3 GSM (Windows) BACNAT variant 2.3

The V2.3 BACNAT repackaging for Global System Manager (Windows) includes the following features:

- Both the Global Client, GLOBAL.EXE, and the Global Server, GLSERVER.EXE, validate the "type" of the Values defined in the Global section of the Registry. This extra checking is required to prevent the unpredictable results that may occur if values of an incorrect type are added to the Global section of the Registry when using the standard Windows Registry editor. This inconsistency can never occur if GLREGED.EXE is used to maintain the Global section of the Registry;
- The problem that caused the Global Client to hang if the "DisplayBufferSize" option is defined in the Registry has been fixed;
- SVC-61 has been enhanced to allow direct calls to an RPC Server. Details of this interface are beyond the scope of this document;
- The problem that allowed the Global Client to be closed, without a Confirmation Box appearing, has been fixed. This problem only occurs when \$.712 is used in the same Global Client session as \$.711 (i.e. sign-on using terminal type 711; run \$E; sign-on using terminal type 712; close the Global Client);
- The problem that caused a "display latency" when using the Global Client on Windows NT Server has been addressed in BACNAT V2.3. However, an improved solution has been implemented in BACNAT V2.5 (see section 5.5, below);
- The problem that caused the "EnableStartAccept" option to be ignored has been fixed;
- The problem that caused the Global Client to crash if the Master Server is closed has been fixed. Note that this problem only occurs if Status Line Polling is enabled;
- The V2.3 BACNAT software includes the V2.1D GUI module. This version of the GUI module (which is a pre-release version of GUI V2.2) is incompatible with the released Global Windows Workstation V2.1A.

5.4 GSM (Windows) BACNAT variant 2.4

The V2.4 BACNAT repackaging for Global System Manager (Windows) includes the following features:

- The problem that caused a severe performance degradation if "thin client" NETWORK consoles (see section 5.2, above) are restarted (i.e. using the \$STATUS RES command) or cancelled (i.e using the \$STATUS CAN command) has been fixed;
- The V2.4 BACNAT software includes the V2.1D GUI module. This version of the GUI module (which is a pre-release version of GUI V2.2) is incompatible with the released Global Windows Workstation V2.1A.

5.5 GSM (Windows) BACNAT variant 2.5

The V2.5 BACNAT repackaging for Global System Manager (Windows) includes the following features:

- The Global Client "display latency" problem has been fully resolved with BACNAT V2.5;
- The V2.5 BACNAT software includes the V2.1E GUI module. This version of the GUI module is, by default, compatible with the released Global Windows Workstation V2.1A. However, the "GUI V2.2" mode can be enabled by setting the following ValueName under the:

\$GLMACH\Client\Screens\GUI\Miscellaneous

sub-key of the Registry:

VGACompatibility Set this parameter to "Off" to enable the GUI V2.2 features of the V2.5/V2.1E BACNAT software. This feature is provided for evaluation purposes only.

- The Console Executive has been enhanced to support 2 new escape sequences that allow the "GUI mode" to disabled/re-enabled under program control. This feature may be used by future versions of the Menu Handler. The Console Executive also supports a new operation that allows Character Translation to be disabled/re-enabled (i.e. the Character Translation that is determined by the TRANSLATIONS section of the TAP and/or the contents of the \$TRtttt file, created and maintained by <SYSREQ> B).

The changes to the Console Executive that were added to support the Global System Manager language translation mechanism (see section 3.4) have been rescinded. This has been necessary to prevent problems with Speedbase applications when text-strings containing the tilde character (0x7e) are displayed and accepted. Note that the Global System Manager language translation mechanism, which has not been fully implemented, should not be confused with the Console Executive Character Translation facility described in the previous paragraph.

The bug that caused characters to be lost occasionally when swapping partitions on a "GUI screen" has been fixed.

- SVC-18 has been enhanced to support the extended interface required for the version of the Open TFAM Access Method that supports a block size larger than 256 bytes (see section 2.6).

5.6 GSM (Windows) BACNAT variant 2.6

The V2.6 BACNAT repackaging for Global System Manager (Windows) includes the following features:

- Disk partitions larger than 4Gb are supported (this change was first implemented in BACNAT variant V2.5A). **Important note:** Although Windows filing system partitions larger than 4Gb are supported, the maximum size of a simulated domain (e.g. A00) remains at 2Gb. However, multiple Global simulated domains can be configured on a particular Windows partition to allow more than 2Gb to be accessed. For example, domains B00, C00, D00 and E00 can be configured on an 8Gb filing system (via 4 Global Servers "B", "C", "D" and "E") to provide Global applications up to 8Gb of data. This technique can be extended to provide up to 52Gb of Global data, with other simple customisations possible to increase this capacity even further;
- The Console Executive and the various console controllers have been enhanced to recognise the following new option in the registry (this change was first implemented in BACNAT variant V2.5B):

```

..\Screens\Network\nn\GlobalWindowsWorkstation
..\Screens\Serial\nn\GlobalWindowsWorkstation
..\Screens\GUI\GlobalWindowsWorkstation

```

The GlobalWindowsWorkstation registry option is reserved for future use;

- The Printer Executive has been enhanced to allow "pooled printing". A pool of printers can be specified by the bottom 4 bits of the printer DEVICE CHARACTERISTICS BYTE:

Bit	Meaning
3	0 = Normal printer; 1 = Pooled printer
2,1,0	Pool number (0 to 7)

For example:

Printer	Value	Description
500	#00	Normal printer
501	#08	Pooled printer, pool-0
502	#08	Pooled printer, pool-0
503	#09	Pooled printer, pool-1
504	#09	Pooled printer, pool-1
505	#0F	Pooled printer, pool-7
506	#0F	Pooled printer, pool-7

If any printer in a particular pool is IN USE, printing will automatically switched to another printer in the same pool. The Pooled Printer option allows simultaneous printing, with a single \$PR assignment, without the need to run the Global spooler, \$SP;

- The Global Client executable file, GLOBAL.EXE, is developed as Windows "Window" application, which prohibits the option to operate in "full screen" mode. An alternative Global Client executable file, GLCONS.EXE, has been developed as a "Console" application to allow Global applications to be run in "full screen" mode **with some**

restrictions (see below). GLCONS.EXE is a "slot-in" replacement for GLOBAL.EXE, supporting all the standard options (e.g. Windows printing, thin-client option etc.) - only the front-end is different.

Although, GLCONS.EXE, is copied from the distribution media (i.e. diskette or CD) to the Global run-time directory by the setup process, a shortcut is NOT established for this option. Replacing GLOBAL.EXE by GLCONS.EXE must be done "by hand" after installation. No configuration file or registry changes are required. All the registry options in the following key, recognised by GLOBAL.EXE, are ignored by GLCONS.EXE:

..\Screens\GUI

The following new registry setting is recognised by GLCONS.EXE and allows the size of the cursor to be specified (as a percentage of a full size cursor, with a default of 20):

..\Screens\GUI\CursorSize

The following special TAP's must be used with the GLCONS.EXE option:

\$.730 80*24; 132*24 for GLCONS.EXE on Windows NT
\$.731 79*24 only for GLCONS.EXE on Windows 95

Important Note-1: 132-wide operation is only available with Windows NT.

Important Note-2: Changing the Terminal Type to 730 or 731 (i.e. from 711) may involve modifying the ..\Client\TerminalType value in the registry.

The window displayed by GLCONS.EXE can be toggled between "windowed" and "full screen" mode by keying <ALT><ENTER>. The properties of the window (e.g. font size etc.) can be modified "on the fly" using normal Windows techniques. The default operating mode (i.e. "windowed" or "full screen") can be customised into the Windows NT shortcut.

There are a number of important differences between GLCONS.EXE on Windows 95 and GLCONS.EXE on Windows NT. The various options are summarised below:

Option	Win-95	Win-NT
80th column position available	No	Yes
full screen mode supported	Yes	Yes
full screen at start-up possible		No Yes
132 wide window supported	No	Yes
132 wide full screen supported	No	No

- The V2.6 GLOBAL.EXE includes the V2.2 Global Windows Workstation module (revision V2.2g). Please refer to the V2.2 Global Windows Workstation Notes for further details;
- The algorithm used to hibernate GLOBAL.EXE when all Global users are inactive has been improved. Global System Manager will only utilise CPU resource when Global users are active. The small (5 second) latency between the last active Global user becoming inactive and CPU usage reducing to a minimal value, typically 1-2%, has been removed;

- The NETWORK controller has been enhanced to return the current status of the TCP/IP connection. The "line connection" status is displayed by the \$STATUS command:

LINE DOWN the console channel is waiting for a thin-client to connect;

SCREEN I/O ERROR an unexpected network error has occurred.

Thus, \$STATUS can be used to determine the status of the NETWORK consoles. In particular, the LINE DOWN condition can be used to determine the state of the connection:

Operator-id?	Line status	Description
No	LINE DOWN	Waiting for a "thin client" to make a connection i.e. the channel is available for a thin client connection either at initial start-up or after a user has run \$E and closed the GUI;
No	NOT SIGNED ON	\$E or \$STATUS/RES has been used to restart the user but the GUI has not been closed;
Yes	ACTIVE etc.	Normal operation - a thin client is connected to Global System Manager;
Yes	LINE DOWN	An operator has closed down the Global Windows Workstation without running \$E. This connection will be unusable until \$STATUS/RES is used to restart the user.

The NETWORK controller will display one of the following error messages when a thin client connection cannot be made:

No more screens available on port nn

This message indicates that all NETWORK entries in the configuration are connected.

Restart a user on port nn before continuing

This message indicates that some of the NETWORK connections are unusable because one, or more, operators have closed down the Global Windows Workstation without running \$E. This message will occur on "pure" NETWORK configurations;

The last user to use this connection did not sign-off correctly. This user must be restarted before the connection can be established. Use \$STATUS to restart the user on console number nn, break this connection and retry the connection again.

This message indicates that some of the NETWORK connections are unusable because one, or more, operators have closed down the Global Windows Workstation without running \$E. This message will occur on NETWORK configurations that include at least one other type of console (e.g. GUI or SERIAL).

Important note: The "console number" in the last message refers to a simple console index, counting from 1. It does NOT refer to USER NUMBER displayed by \$STATUS.

- If the Endpoint value for ncacn_ip_tcp Client-Server connections is removed from the registry the recommended values (e.g. 3000 for server "A", 3001 for server "B" etc.) will be used automatically by both the Global Client and the Global Server. This option is recognised by GLOBAL.EXE, GLSERVER.EXE and GLSSTART.EXE;

- The following registry option:

```
..\Client\NodeID
```

can be overridden by the value associated with the /EN command line argument. This feature allows the Symmetric Multiple Client (SMC) option to be configured. Please refer to the Global System Manager V8.1 (Windows) Global Configuration Notes for further details;

- A problem in SVC 70 that can result in a General Protection Error if the supplied pathname is invalid has been fixed;
- A problem that prevented the use of the letter "V" for (unofficial and unsupported) End-User System Request has been fixed;
- GLOBAL.EXE has been enhanced to accept pathnames quoted in matching double-quotes. This allows pathnames that include space characters to be used. Note that some of the other Global System Manager (Windows) utilities (e.g. SETUP.EXE and GLDFMAIN.EXE) have NOT been upgraded to supported quoted filenames;
- GLOBAL.EXE uses the value associated with the /W command line argument as a delay (in seconds) before closing the main window after \$BYE or an unexpected termination. For example, to delay for 10 seconds, to allow a \$57 INITIATION ERROR to be read, include /W=10 in the GLOBAL.EXE command line;
- The name of the configuration file can be overridden using the /EC command line argument. THIS OPTION SHOULD NOT BE USED AND IS RESERVED FOR FUTURE EXPANSION;
- If the NetworkAddress value for ncacn_ip_tcp Client-Server connections is removed from the registry the /IP command line argument can be used to specify the IP address of one, or more, Global Servers;
- Further enhancements have been made to the NETWORK controller to improve the performance of thin-client configurations;
- A new option in the DOSPRINT controller, for use when creating files on a "spooled directory", is now available. The new option which is enabled by the following option in the registry causes the filename suffix to automatically wrap from .999 to .000 (instead of returning a DIRECTORY FULL error message):

```
..\Printers\DOSPrint\5nn\SuffixWrap
```

- A new option in the DOSPRINT controller, for use with the Pooled

Printer option (see above) when creating files in a "spooled directory", is now available. The new option which is enabled by the following option in the registry changes the algorithm used to form the filename of the file in the "spooled directory":

```
..\Printers\DOSPrint\5nn\PooledPrinter
```

When this option is enabled, the name of the file is:

```
xxxxxxpp.nnn
```

where xxxxxx are the first six characters of the Global filename; pp is the printer unit minus 500 (e.g. 00 for printer 500; 01 for printer 501, etc.); nnn is the auto-incrementing file suffix (i.e. 000, 001, to 999).

- The deliberate restriction that prevented a Global Client being configured with a node-id between "A" and "Z" has been removed. The GLOBAL.EXE /X command line argument allows the Global Client NodeID in the registry to be set to any value between 1 and 26 (corresponding to "A" to "Z"). **Important note:** Although this option allows a Global Client to be allocated a notional file server node-id (e.g. "A") the Global Client cannot be accessed as a file server by other Global Clients on a network;
- The NETWORK controller has been enhanced to include some of the functionality of a general-purpose telnet host. The following new registry options are available:

```
..\Screens\Network\nn\IgnoreIACSequences
..\Screens\Network\nn\LogIACSequences
```

Important note: These changes have been implemented for internal use only when connecting GSM(Windows) to a 3rd party telnet emulator. The "thin client" NETWORK controller is only supported externally with the 16-bit Global Windows Workstation (i.e. GSMWIN.EXE) operating in "TCP/IP external host" mode or the 32-bit Global Windows Workstation (i.e. GSMWIN32.EXE) operating in "telnet" mode;

- The following reserved option has been added to the registry:

```
..\Data\RAMDisk\RAMDiskSizeKb
```

5.6.1 GSM (Windows) BACNAT variant 2.6 (revised August-1998)

During August 1998 the V2.6 BACNAT software for Global System Manager (Windows) was revised to include updated versions of the following components:

Component	Version released with original V2.6	Version released with updated V2.6
GLCONS.EXE	5-May-1998; filesize 344,064 bytes	18-Aug-1998; filesize 340,992 bytes
SPEEDBAS.EXE	Version V1.31	Version V1.56

The revised GLCONS.EXE includes the following features:

- GLCONS.EXE now functions correctly on Windows 98. The version released with the original V2.6 BACNAT failed to recognise the 4 cursor movement keys or the Insert, Home, Page-Up, Delete, End and Page-Down keys when running on Windows 98;
- GLCONS.EXE now recognises the <SHIFT><TAB> key when running on Windows 95 and Windows 98;
- GLCONS.EXE now recognises the “f” character when running on Windows NT Workstation;
- The problem that caused the screen to scroll unexpectedly, resulting in the status-line being over-written by the top line of the application screen after a baseline clear, has been fixed. This problem occurred in a variety of utilities and Cobol applications. For example, in \$CUSP after <ESC> is keyed to the baseline prompt of the Printer Maintenance screen.

The revised SPEEDBAS.EXE includes the following features:

- The option to hold Speedbase Btrieve databases in Btrieve 7.x format when using Pervasive SQL (aka Btrieve 7) is now supported. This option is fully described in sections C.12 and D.11. Mixed Btrieve configurations (i.e. combinations of Btrieve 6.x and 7.x format databases) are supported.

Important note: Any site that is currently using an unofficial pre-V1.56 SPEEDBAS.EXE to access Btrieve 7.x format databases MUST rebuild all existing V7.x Btrieve format Speedbase databases immediately after installing the V1.56 SPEEDBAS.EXE: As soon as the V1.56 SPEEDBAS.EXE has been installed and loaded all V7.x Btrieve databases must be rebuilt, using \$BADN option 2, before any attempt is made to access the databases using a Speedbase application;

- SPEEDBAS.EXE has been enhanced to include the “change path to database” functionality. However, \$BADN does **NOT** currently support the “Change path to database” option (i.e. option 6) on GSM (Windows);
- A serious problem, that results in severe database corruption when two, or more, (fast) database rebuilds and/or (fast) conversions are attempted simultaneously, has been fixed. This problem will only occur with the (evaluation) V1.53c SPEEDBAS.EXE;
- SPEEDBAS.EXE now supports the “fast” database conversion/rebuild mode.

This option is enabled by default and cannot be disabled;

- SPEEDBAS.EXE supports a special diagnostic operation that is reserved for future use.

5.7 GSM (Windows) BACNAT variant 2.7

The V2.7 BACNAT repackaging for Global System Manager (Windows) includes the following features in GLOBAL.EXE, GLCONS.EXE and GLSERVER.EXE:

- The GUI controller in GLOBAL.EXE (i.e. for “fat client” installations) is fully compatible with the V2.3 Global Windows Workstation (GUI) product. These changes have resulted in a large number of new Registry settings and new options in the GLOBAL.INI file. Please refer to the V2.3 Global Windows Workstation Notes (MGUNV2.3) and Global System Manager (Windows) Configuration Notes (C5661 and C5663) for further details;
- The V2.3 Global Windows Workstation (GUI) product (i.e. GSMWIN32.EXE for “thin client” configurations) is now distributed with the V2.7 Global System Manager (Windows) software. For diskette configurations the GUB (GUI installation) diskette is distributed with the B5661 and X5661 diskettes; for CD configurations the GUA and GUB installation directories are distributed on the Global System Manager (Windows) CD. Please refer to the V2.3 Global Windows Workstation Notes (MGUNV2.3) for further details;
- The SVC-67 module in GLOBAL.EXE and GLCONS.EXE now supports the new operation required by Global System Manager V8.1i, Global 3000 V4.5 and Global Reporter V1.4. **GLOBAL 3000 V4.5 WILL ONLY OPERATE ON THE V2.7, OR LATER, GLOBAL SYSTEM MANAGER (WINDOWS NT) BACNAT VARIANT;**
- The SERIAL controller in GLOBAL.EXE and GLCONS.EXE now supports serial consoles on Windows 95 and Windows 98 (see below);
- The SERIAL controller in GLOBAL.EXE and GLCONS.EXE has been enhanced to recognise the following new registry option to select the serial port mode:

```
..\Screens\Serial\nn\Mode
```

The default mode is 9600,N,8,1,X (i.e. 9600 baud, No parity, 8 data bits, 1 stop bit, X-on/X-off protocol).

If the Mode setting is not specified on Windows NT, Global System Manager will reprogram the serial mode as specified in the Windows control panel for the specified COM device. If the Mode setting is not specified on Windows 95 or Windows 98, Global System Manager will NOT attempt to reprogram the serial port (i.e. the last port setting, or the Windows default if no other application has used the serial port, will be used);

- The DOSPRINT controller in GLOBAL.EXE and GLCONS.EXE has been enhanced to recognise the following new registry option to select the serial port mode:

```
..\Printers\DOSPrint\5nn\Mode
```

The default mode is 9600,N,8,1,X (i.e. 9600 baud, No parity, 8 data bits, 1 stop bit, X-on/X-off protocol).

If the Mode setting is not specified on Windows NT, Global System Manager will reprogram the serial mode as specified in the Windows control panel for the specified COM device. If the Mode setting is

not specified on Windows 95 or Windows 98, Global System Manager will NOT attempt to reprogram the serial port (i.e. the last port setting, or the Windows default if no other application has used the serial port, will be used).

- A problem in the TRAMS interpreter in GLOBAL.EXE and GLCONS.EXE has been fixed to allow \$COBOL to be used on multi-user Global System Manager (Windows) configurations. The symptom of this problem was a large number of unexplained compilation errors when using \$COBOL;
- A problem in GLOBAL.EXE and GLCONS.EXE that causes the Global System Manager system date to advance by up to several years if the Global client has been running continuously for more than 49.7 days, has been fixed;
- A problem with the “switch GUI mode off” handling in GLOBAL.EXE has been fixed. The symptom of this problem was a performance degradation when running applications or utilities (e.g. \$BAGDN) in “non GUI mode” on terminal type \$.711, \$.714 etc.;
- The Global System Manager (Windows) File Executive in GLOBAL.EXE, GLSERVER.EXE and GLCONS.EXE has been enhanced to include the new operations supported by the \$UNLOCK and \$CLOSE utilities. Note that the \$UNLOCK and \$CLOSE utilities have NOT yet been released with external versions of Global System Manager.
- The Discrete Data File (DDF) controller in GLOBAL.EXE, GLSERVER.EXE and GLCONS.EXE has been enhanced to recognise the following new (highly-specialised) registry option:

```
..\.Data\DiscreteDatafiles\DDFn\WriteThroughCache
```

When this option is enabled the Windows NT cache is effectively used as a Write-Through buffer. For most installations it should never be necessary to enable this option.

- The DISKETTE controller in GLOBAL.EXE, GLSERVER.EXE and GLCONS.EXE has been enhanced to recognise a number of new values for the ‘Diskette’ registry value. The following values are now recognised:

```
0      Diskette disabled
1      Diskette enabled (using physical locking)
2      Diskette enabled (using volume locking)
3      Diskette enabled (no locking)
>4    Same as 1
```

The new values (i.e. 2 and 3) MAY overcome some problems experienced when using some type of diskette drives on Windows 95 and Windows 98.

In addition, if the ‘DiagnosticDisplays’ option is enabled the DISKETTE controller displays the error code returned by the DOS-compatible diskette operation (i.e. the operation that is used to access the diskette drive on Windows 95 and Windows 98).

Furthermore, the error code returned when a ‘media change’ error is reported has been changed from the non-retryable error “H” to a retryable error -1;

- The status-line handling in GLSERVER.EXE has been enhanced to allow up

to 255 Global Clients (the limit was 228). This change fixes the unexpected errors that may occur when Global Clients are configured with node-id's 'A' to 'Z';

- The status-line handling in GLSERVER.EXE has been enhanced to fix a problem that results in a spurious 'Binding Handle is Invalid' error if the Global System Manager 'Master NodeID' is set to a (strictly invalid) value outside the range 'A' to 'Z';
- The client-server logic in GLOBAL.EXE and GLCONS.EXE has been enhanced to recognise the following new (highly-specialised) registry option:

..\Global\Client\RPCWriteReadOp

When this option is enabled the Global Client uses a Write/Read RPC opcode instead of a Read RPC opcode, where appropriate. Enabling this option will reduce the number of Windows NT page faults that may be generated by the Global Server (sic) under some conditions.

5.8 GSM (Windows) BACNAT variant 2.8

The V2.8 BACNAT repackaging for Global System Manager (Windows) includes the following features in GLOBAL.EXE, GLCONS.EXE and GLSERVER.EXE.

Important Note: Due to the rapid development of GSM (Windows) the released V2.8 BACNAT variant is expected to be quickly replaced by newer versions. Please check the Technology pages on the Global web-site for details of updates to the GSM (Windows) BACNAT software.

- The GSM (Windows) nucleus in both GLOBAL.EXE and GLCONS.EXE includes support for the 32-bit GSM run-time system. Please see Appendix F for further details.
- True concurrency is now supported on GSM (Windows) when a "GUI mode" TAP (e.g. \$.711) is being used. Until this enhancement, although true concurrency (i.e. multiple partitions executing concurrently), was supported on "text mode" TAP's (e.g. \$.712 & \$.716), background partitions would suspend on "GUI mode" TAP's (e.g. \$.711). The following registry option must be set to "On" to allow true concurrency:

```
..\Global\Client\Nucleus\ConcurrentGUI
```

Important Note: This registry option is subject to change in future versions of GSM (Windows).

This option affects all the screens configured on the Global Client (i.e. the fat-client via the "GUI" console controller as well as any thin-client screens connected via either the "Network" or "Serial" console controllers);

- The Global Server automatically listens on BOTH "Local RPC" and the RPC interface specified in the registry. This feature allows a Global Server to service requests from both a local Global Client (via the "Automatic-Local RPC connection") and remote Global Client(s) (via the RPC connection specified in the registry i.e. normally ncacl_ip_tcp). When this feature is enabled, the following message will appear on the GLSERVER.EXE messages screen:

```
Enabling additional local RPC connection, GLSERVER_x
```

This feature allows the intra-computer Global Client to communicate with the Global Server using the ncalrpc protocol which is always faster than the ncacl_ip_tcp protocol. The Endpoint used by the Global Server for the "Automatic-Local RPC" connection is always "GLSERVER_x" where x is the server node-id e.g. GLSERVER_A for server "A" etc.). Note that if the Endpoint key is missing from Global Client section of the registry the default Endpoint appropriate for the local Global Server will be used. For example, the ValueNames under the key for server "L" in the Client section of the registry can contain either:

```
..\Global\Client\Servers\L\ProtocolSequence = ncalrpc
..\Global\Client\Servers\L\NetworkAddress = <blank>
..\Global\Client\Servers\L\Endpoint = GLSERVER_L
```

or:

```
..\Global\Client\Servers\L\ProtocolSequence = ncalrpc
..\Global\Client\Servers\L\NetworkAddress = <blank>
```

- In addition to the Automatic-Local RPC connection the Global Server can be customised to use an additional non-RPC interface to communicate with a Global Client running on the same PC. This extra functionality, which supplements the Standard RPC interface (i.e. the RPC interface specified in the `..\Global\Servers` section of the registry) and Automatic-Local RPC (described above) is enabled by setting the following registry entry:

```
..\Global\Servers\x\EnableGSMRPC
```

where x is the server node-id (e.g. A, B, etc.). If this option is enabled, the following message will appear on the GLSERVER.EXE messages screen:

```
Enabling gsmrpc connection
```

To configure a local Global Client to use the GSMRPC interface, which is much faster than Local RPC and very much faster than intra-computer TCP/IP RPC, the following registry option must be set:

```
..\Global\Client\Servers\x\ProtocolSequence = gsmrpc
```

The following registry option must be present but must be set to <blank>:

```
..\Global\Client\Servers\x\NetworkAddress
```

The following registry option can either be absent or, if specified, must be set to "GLSERVER_x" (where x is the server node-id):

```
..\Global\Client\Servers\x\Endpoint
```

Important Note 1: The new Server registry ValueName is "EnableGSMRPC" whereas the new Global Client registry Value for the ProtocolSequence ValueName is "gsmrpc". This subtle difference is deliberate.

Important Note 2: At the time of writing, only a single "local" Global Client can connect to a Global Server using the "gsmrpc" protocol. Thus, this new option is not currently available for Symmetric Multiple Client (SMC) configurations. This restriction is being addressed.

- The DOSPrint printer controller has been enhanced to recognise the following new options in the `Global\Client\Printers\DOSPrint\5nn` section of the registry:

PostCloseProgramName This option specifies the name of an optional Windows program to be invoked immediately after the Windows print file has been closed. This option only applies to the DOSPrint "print to file" or "print to spool directory" options - it does NOT apply to the "print to DOS device" option;

AppendFileNameAfterClose If the PostCloseProgramName option has been specified (see above) this option determines whether the name of the nascent Windows print file should be passed as a command line parameter to the program identified by the PostCloseprogramName

option;

CreateTempFileName If the `PostCloseProgramName` option has been specified (see above) this option determines whether the name of the Windows print file should remain fixed thus allowing the name of the intermediate print file to be re-used. If this option is enabled, the name of the print file is always `tempxxhh.txt` (where `xx` is the Global Client node-id and `hh` is the User Number);

PostCloseAlias By default, if the `AppendFileNameAfterClose` option is enabled the name of the file appended to the `PostCloseProgramName` is the full pathname of the nascent Windows print file. This filename may not be appropriate in thin-client configurations where the Windows program is initiated on the thin-client PC (i.e. rather than the server) and the share-name of the print spool directory is different from the name specified in the "Name" key in the registry. For example, if the "Name" option is set to `"C:\gsmnt\prints\"` on the PC running `GLOBAL.EXE` and this directory is mapped to `"\\tisgsmc\prints"` on the PC running the thin-client (i.e. the PC on which the invoked program will be running) then the `PostCloseAlias` option should be set to `"\\tisgsmc\prints\"`;

- The WinPrint printer controller has been enhanced to recognise the following new options in the `Global\Client\Printers\WinPrint\5nn` section of the registry:

FlushOnAlignment If this option is enabled the Printer Executive informs the WinPrint controller immediately (i.e. rather than waiting for the Timeout period to elapse) that the contents of print file must be flushed out to the printer because a Stationery Alignment Message has been displayed;

FaxInterface This option allows the WinPrint option to interface directly to the LG-Fax product. Further details are available upon request;

PrintViaSeparateThread This option is reserved for future use.

Furthermore, a problem in the WinPrint controller that caused an "Error 6 from EndDocPrinter - The handle is invalid" if either the Timeout or FlushOnAlignment options are enabled in the WinPrint section and the DiagnosticDisplay option, has been fixed.

- Auxiliary (i.e. back-of-screen) printing is now supported in GSM (Windows). To enable this option changes to both the Global Configuration File and the Windows registry are required. The following example dialogue adds an Aux. Printer (controller name

\$AUXPRI) to the configuration file (provided the date of the A.W1 Action File is 15/02/99, or later):

```
CONTROLLER [ 4] (      ) :$AUXPRI  SCREEN AUXILIARY PRINTER
UNIT NUMBER ( 521):
DESCRIPTION (SCREEN AUXILIARY PRINTER ) :
HARDWARE FORM FEED (Y):
MAXIMUM PAGE WIDTH ( 132):
TIME-OUT IN TENS OF SECONDS ( 2):
SPOOLER CONTROL BITS (#00):
PRINTER EXECUTIVE FLAG BYTE (#FF):
```

Note the absence of controller options in the CFUPDATE dialogue.

The following options in the Global\Client\Printers section of the registry must be added:

AuxPrint\5nn\ConsoleNumber This must specify the Console Number of the screen to which the Aux. Printer is attached. The console controller must be either "Serial" or "Network". A value of 0 indicates a "floating" Auxiliary Printer, in which case all the other options are ignored (the options actually used are taken from the registry settings of the "real" Aux. Printer that the "floating" Aux. Printer is mapped to);

AuxPrint\5nn\ScreenType This option specifies the screen type:

0	Invalid
1	PCWS
2	TCL Nyce and Wyse-60
3	TVI range
4	Reserved for diagnostics (reverse video)
5	Reserved for Global Windows Workstation
6	Reserved for diagnostics (transparent)
7 - 9	Reserved for future use
10 - 19	Reserved for Global Windows Workstation

Important note: At the time of writing, the released version of the Global Windows Workstation does **NOT** support Auxiliary Printing although evaluation versions that do support Aux. Printing may be down-loaded from the Technology section of the Global web-site.

AuxPrint\5nn\PrintingMode This option specifies the printing mode:

0	Invalid
1	Printing has higher priority than displays
2	Printing has lower priority than displays

Note that an "ImmediateError" option is not supported.

- The Global System Manager (Windows) SETUP.EXE utility has been enhanced in several areas:
 - SETUP allows the choice between the Speedbase Btrieve Gateway (SPEEDBAS.EXE) or the Speedbase SQL Server Gateway (SPEEDSQL.EXE and SPEEDGAT.EXE - see Appendix E). If the Speedbase SQL Server option is selected the SQL User, Password and default database size can be configured;
 - SETUP allows the choice between a Global 3000 style colour scheme and a Global 2000 style colour scheme. If the Global 3000 style is selected, the default text colour combination for non Speedbase applications will be "black on grey". If a Global 2000 style is selected the default text colour combination for non Speedbase applications will be "green on black". See Appendix B, and section A.4.2, of the Global Windows Workstation V2.3 Notes for further details;
 - The current installation directory is preserved over the sequential installation of the Global Client, Global Servers and Speedbase Gateway;
 - GLSSTART.EXE is no longer installed for a Global Client only installation;
 - The "gsm!rpc" Protocol Sequence (short-hand form = "GSM") is allowed during the Global Client installation;
 - The "EnableGSMRPC" setting can be specified during the Global Server installation.
- The File Executive module in both the Global Client and the Global Server has been enhanced to support an extended 32-bit Lock operation. A problem with Sense Message displayed when a GSM disk or diskette I/O Error is reported, has been fixed. Furthermore, the File Executive has been upgraded to support User Numbers up to 250 (the previous limit was 99);
- The Printer Executive module in the Global Client has been enhanced to support User Numbers up to 250 (the previous limit was 99);
- The Console Executive module in the Global Client has been enhanced to support a number of new options:

..\Global\Client\Nucleus\CheckGWWFlag When this option is enabled the TAP load mechanism will check that the setting of the GlobalWindowsWorkstation flag in the registry for the Serial or Network controller (see section 5.6) agrees with the setting of the "GWW" flag in the TAP (see section 2.8). If a mismatch is detected an INVALID TAP (GUI) error message will be displayed. This option has been introduced to prevent an

inappropriate TAP from being used with the Global Windows Workstation;

..\\Global\\Client\\Nucleus\\ConsoleDiagnostics When this option is enabled all the characters displayed on the first console, until the TAP is loaded, are written to a diagnostic file conslog.bin in the Global directory. This option can be used to diagnose fatal GSM Load errors;

..\\Global\\Client\\Nucleus\\ConsoleLogging When this option is enabled all the characters displayed on the first console are written to a diagnostic file conslog.bin in the Global directory;

..\\Global\\Client\\Nucleus\\LogKeystrokes When this option is enabled all keystrokes processed by the Console Executive are written to a diagnostic file keylog_nn.bin (where nn is the Console Index) in the Global directory;

The Console Executive also supports the option to display Status Line messages in a Windows Dialogue box (for use with TAP's \$.751 and \$.754 - see section 2.8). Furthermore, the Console Executive now supports a highly-specialised play-back mechanism which is implemented by reading characters from the file gsmjob_xx.txt (where xx is the Global Client node-id).

- The \$TAPE controller for GSM (Windows) has been enhanced in several areas. The special End-Of-Media error from the Write operation is treated specially and is returned as an error "S" to \$TAPE. Detailed diagnostic and tape status information is displayed when the diagnostic version of \$TAPE (i.e. \$TAPED) is being used. The Tape Drive Information is displayed, in a Windows dialogue box, when \$TAPED is run before the main menu is displayed; the Media Information is displayed, also in a Windows dialogue box, by the \$TAPE Load operation. Thus, the Media Information dialogue box may appear several times during a "composite \$TAPE operation" such as Save and Verify.

The following new registry options are recognised by the \$TAPE controller:

..\\Global\\Client\\Tape\\Partitioning If this option is enabled, \$TAPE will create a single partition of the maximum length for each Tape Header written to the tape. In addition, the tape is positioned at the beginning

of the first

operation. This

DAT drives.

select a specific

is NOT

partition for every Tape Load option should only be enabled for

Note that it is NOT possible to tape partition. Tape Partitioning

supported for QIC drives;

..\Global\Client\Tape\Compression This option enables Data Compression. If data compression is not supported by the tape drive a warning message will be displayed;

..\Global\Client\Tape\DataPadding This option enables Data Padding. Data Padding may be required to maintain tape streaming rates and will result in faster backups at the expense of reduced "actual" tape capacity. If data padding is not supported by the tape drive a warning message will be displayed.

- A problem in GLOBAL.EXE that causes Memory Violations and General Protection Errors when \$BYE is run on a configuration that includes one, or more, Network screen controllers, has been fixed;
- The Caption Text is prefixed with the Global Client node-id, allowing the node-id to be readily determined from the Windows Task Bar. Note that this option is only enabled if the /EN:xx GLOBAL.EXE command line argument has been used to specify the node-id for Symmetric Multi-Client (SMC) or Asymmetric Multi-Client (AMC) configurations;
- A problem with the Network console controller that caused binary-zeroes to be ignored, has been fixed;
- The DiscreteDataFiles controller has been enhanced to return a unique error "f" (sic) if a Read or Write operation fails because another process has locked a portion of a .SVL file. This error will occur when a Backup Manager application has opened a .SVL file in non-shared mode. Furthermore, a problem in the DiscreteDataFile controller that can result in a Memory Violation upon closing the Global Server (or running \$BYE on the Global Client) when read-only sub-volumes have been accessed under some conditions, has been fixed;
- SVC-61 has been enhanced to maintain a list of Open File Handles. A new operation, DSFUNC=126, is available to close all the Open File Handles. **Important note:** This feature is subject to change in future versions of GSM (Windows);
- A new SVC-80 has been implemented which provides faster conversions for \$BBS and \$COMPRES.
- The following new registry option provides an easily customised override to the Number of Memory/Monitor Pages patched into the

\$MONITOR file by the \$F PAM and CMP commands:

```
..\Global\Client\Nucleus\MaximumMemoryPages
```

The GSM start-up code always uses the higher of the value patched into \$MONITOR and the value of the MaximumMemoryPages registry setting;

- The following new registry option allows the name of the Global Configuration file to be specified:

```
..\Global\Client\ConfigurationFileName
```

Although this option can be used it is reserved for future use (for AMC configurations);

- The following new registry option allows the name of the GSM "Bootstrap device" to be specified:

```
..\Global\Client\BootDevice
```

Although this option can be used, to allow GLOBAL.EXE to be started without specifying any command line arguments (e.g. by double-clicking on the GLOBAL.EXE icon in Windows Explorer), it is reserved for future use (for AMC configurations);

- The following registry options pertain to the Speedbase SQL Server Gateway (SPEEDSQL.EXE and SPEEDGAT.EXE) and are described in Appendix E:

```
..\Global\Speedbase\SpeedbaseSQLPassword
..\Global\Speedbase\SpeedbaseSQLUser
..\Global\Speedbase\DefaultDatabaseSize
..\Global\Speedbase\FastConversion
..\Global\Speedbase\IdentityFillin
```

- The following registry options pertain to the 32-bit run-time environment and are described in Appendix F:

```
..\Global\Client\Nucleus\SVC79Diagnostics
..\Global\Client\Nucleus\SVC79DiagLevel
..\Global\Client\Nucleus\PageTableEntries
..\Global\Client\Nucleus\TrapTableEntries
..\Global\Client\Nucleus\LinkStackEntries
```

- The V2.8 GLOBAL.EXE includes the V2.3t Global Windows Workstation (GUI) module. This version of the GUI module recognises the following new registry options:

```
..\Global\Client\Screens\GUI\Miscellaneous\Enable8BitMode
..\Global\Client\Screens\GUI\Miscellaneous\EnableFormMode
..\Global\Client\Screens\GUI\Miscellaneous\EnableIgnoreFields
..\Global\Client\Screens\GUI\Miscellaneous\FullToolbar
..\Global\Client\Screens\GUI\Miscellaneous\ChangePartitionTrigger
..\Global\Client\Screens\GUI\IsoTranslations\ISOCharnnn
```

These options, which are reserved for future expansion, should not be used and will be fully described in the Global Windows Workstation V2.4 Notes.

- The following registry options are reserved for future use, and should NOT be used:

```

..\Global\Client\UseConfigurationFile
..\Global\Client\SerialPortDriver\nn\Name
..\Global\Client\SerialPortDriver\nn\Mode
..\Global\Servers\UseConfigurationFile
..\Global\Client\Nucleus\SVC86Diagnostics

```

The revised (V1.67) Speedbase Gateways include the following features:

- First release of the Speedbase SQL Server Gateway (SPEEDSQL.EXE & SPEEDGAT.EXE). See Appendix E for full details of the Speedbase SQL Server option;
- Changes to the Speedbase Btrieve Gateway to fix the Btrieve error 238; STOP 25403 problem that can occur when a previously disconnected Global Client re-attaches to the Gateway and deletes the locks of the Global Client that immediately precede it in the Gateway's list of attached clients;
- Support for the "Get Lock Information" operation used by the \$BAST Display Locks function (see section 2.8);
- Support for the 32-bit Speedbase Database manager (see Appendix F);
- Support for mixed SPAM/Speedbase database operations.

Please refer to the Global System Manager (Windows) Configuration Notes for a full list of released versions of the Speedbase Gateways.

5.9 GSM (Windows) BACNAT variant 2.9A

The V2.9 BACNAT repackaging for Global System Manager (Windows) includes the following features in GLOBAL.EXE, GLCONS.EXE, GSMCONS.EXE and GLSERVER.EXE. Note that the Production version of the GSM (Windows) BACNAT is actually V2.9A (i.e. rather than V2.9).

- The 32-bit run-time system in the GSM (Windows) nucleus in both GLOBAL.EXE and GLCONS.EXE has been upgraded extensively. **ALL 32-BIT DEVELOPERS AND END-USERS SHOULD UPGRADE FROM BACNAT V2.8 TO BACNAT V2.9A;**
- There appears to be some confusion regarding the various fat vs. thin, GUI vs. console options available with GSM (Windows). The following table should help:

Client type	Window or Console	application	Name of executable
	aide-mémoire		
Fat	Window (GUI)	application	GLOBAL.EXE FATGUI
Thin	Window (GUI)	application	GSMWIN32.EXE THINGUI
Fat	Console/full-screen	application	GLCONS.EXE
FATCONS			
Thin	Console/full-screen	application	GSMCONS.EXE
THINCONS			

The current Production variants of these components are:

Module	Variant
GLOBAL.EXE	V2.9A/V2.5c
GLSERVER.EXE	V2.9A
GLCONS.EXE	V2.9A/V2.9
GSMCONS.EXE	V2.9

See below for full details of the GSMCONS.EXE telnet emulator;

- The GLOBAL.EXE and GLCONS.EXE components have been enhanced to automatically create a log file, gsminfo.bin, when GSM is initiated. This log file contains various system information (e.g. BACNAT variant, GSM version, GSM revision, configuration code, Windows version etc.).

PLEASE PROVIDE A COPY OF THE PRE-COMPRESSED gsminfo.bin FILE WHEN REPORTING ANY TYPE OF PROBLEM WITH GSM (WINDOWS NT);

- The GLREGED.EXE template file, GLMACH.TLT, includes several new settings that start with the “%” character. **THESE SETTINGS ARE RESERVED FOR FUTURE USE AND SHOULD NOT BE USED;**

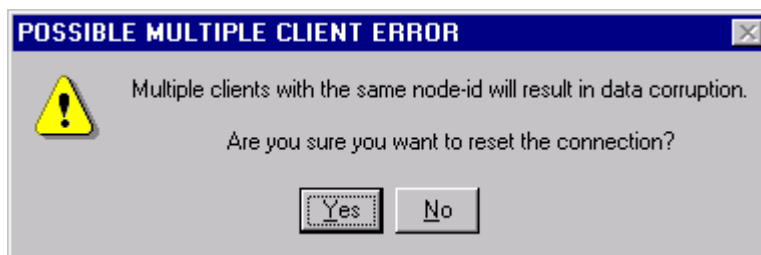
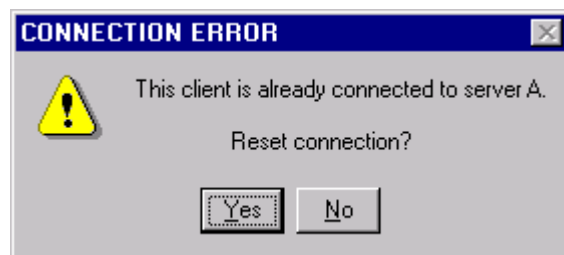
- The default behaviour when a Global Client is already connected to a Server has been changed. By default, the following Fatal Connection Error dialogue box will appear:



This default action can be modified by setting the following registry setting to "On":

..\Global\Client\AllowClientReconnection

The severity of the warning message that appears when a Global Client is already connected to a Server (and the AllowClientReconnection option is enabled) has been increased. Two dialogue boxes, rather than one, now appear:



ONLY IGNORE THESE WARNINGS IF YOU 100% SURE THAT THERE ARE NO CLIENT NODE-ID CLASHES OTHERWISE SEVERE DATA CORRUPTION WILL OCCUR;

- Changes have been made to the \$E handling in GLOBAL.EXE and GLCONS.EXE to allow the "ExitOn\$E" option in the GUI GSMWIN32.INI file to have an effect when a non-GUI TAP (e.g. \$.712) is being used. The "ExitOn\$E" option (in GSMCONS.INI) is also supported by GSMCONS.EXE (see below) when a text-mode TAP (i.e. \$.730 or \$.731) is being used;
- The DOSPrint controller now recognises the following new option in the registry:

..\Global\Client\Printers\DOSPrint\5nn\FixedFileSuffix

If this option is set to a 3 character extension (e.g. "txt" or "bat") the DOSPrint controller, when writing to a Spool Directory, will create filenames of the form:

xxxxxnnn.sss

where nnn is an incrementing number, sss is the filename suffix and xxxxx are the first 5 characters of the Global filename. Note that if the "FixedFileSuffix" option is set to anything other than a 3 character string it will be ignored;

- A problem, introduced by the changes to implement the 32-bit run-time option, which cause the V2.8 Global Client to appear to hang if all the servers P,Q,R,S,T,U,V,W have been accessed has been fixed;
- A series of new registry settings provide more control over the automatic "linear" NETWORK Port number adjustment for Symmetric Multiple Client (SMC) configurations:

..\Global\Client\PortNumberForNodeXX

where XX is any 2 digit decimal number between 27 and 99.

The "natural" node to network port mapping is:

..\Global\Client\PortNumberForNode28=24

..\Global\Client\PortNumberForNode29=25

..\Global\Client\PortNumberForNode30=26

To change the telnet port used for node 30 to 1000, for example:

..\Global\Client\PortNumberForNode30=1000

Before changing port numbers their status must be ascertained. The Windows NETSTAT command may be useful;

- When the Symmetric Multiple Client (SMC) option is being used, the "SingleInstance" option must be disabled, otherwise the multiple clients cannot be started. However, the "SingleInstance" option is extremely useful and should normally be enabled at all times. GLOBAL.EXE has been enhanced to tag the Global Client node-id, specified by the /EN command line option, to the string "Global System Manager" that is used to register the Global Client to Windows. This change allows the "SingleInstance" option to be enabled in SMC configurations. **YOU ARE STRONGLY ADVISED TO ENABLE THIS OPTION AT ALL TIMES;**
- The GLCONS.EXE module has been enhanced to include all the V2.9A features that are included in GLOBAL.EXE. As documented in section A.6, the version/variant number of GLOBAL.EXE consists of two parts: The GSM (NT) nucleus version (e.g. V2.9A) and the Global Windows Workstation version (e.g. V2.5b).

Similarly, the version/variant number of GLCONS.EXE also consists of two parts: The GSM (NT) nucleus version (e.g. V2.9A) and the "GSMCONS" emulator version (e.g. V2.9). Both these version numbers are

displayed on the GLCONS.EXE caption bar;

- GLCONS.EXE has been repackaged to prevent the appearance of spurious characters appearing on the screen immediately after the TAP has been loaded;
- The default value for the "MaximumMemory" setting was 4096 (i.e. 4Mb). This has been increased to 32768 (i.e. 32Mb). The maximum value for the "MaximumMemory" setting was 16384 (i.e. 16Mb). This has been increased to 131072 (i.e. 128Mb);
- The Console Executive has been enhanced to alter the sequence of displays that take place when a partition is refreshed. This change fixes a problem that causes some fields in Speedbase applications, or lines in \$SDE, to switch from dim to bright during a screen refresh;
- The Printer Executive now supports a new operation that is used by the Printer Control File handler to determine if a printer has been designated a "Pooled Printer";
- A problem that causes GLOBAL.EXE to crash if a Pooled Printer has been dynamically removed from the configuration (e.g. if the printer unit has is associated with a missing COM port), has been fixed;
- A very obscure problem in the Printer Executive has been fixed: Consider a program that opens a printer (e.g. 500) but exits without explicitly closing the printer (because of a PGM CHK, for example). Between the printer open and the abnormal exit, another user opens a different printer (e.g. 501) so that printer 501 becomes the "last printer used". When the first user returns to the READY prompt or the main menu, the printer is reset. However, the bug caused the "last printer used" (i.e. 501) to be reset rather than the "last printer opened by that user" (i.e. 500). The second user suffers an ERROR N when attempting to print to 501 (after it has been inadvertently closed);
- A bug in the WinPrint controller has been fixed that caused the following registry options to be ignored:

```

..\Global\Client\Printers\WinPrint\5nn\FlushOnAlignment
..\Global\Client\Printers\WinPrint\5nn\FaxInterface
..\Global\Client\Printers\WinPrint\5nn\PrintViaSeparateThread

```

if the following setting is left blank:

```

..\Global\Client\Printers\5nn\WinPrint\Name

```

- A problem in the AuxPrint controller that results in a spurious NOT READY error has been fixed. Furthermore, two new options have been added to enable Polled Printing mode, which will reduce the performance overhead on other Global applications when using the AuxPrint controller. Set the following option to "On" to enable the Polled Printer mode:

```

..\Global\Client\Printers\AuxPrint\PolledMode

```

The value of the following setting can be used to alter the relative priority of the AuxPrint process and the other Global applications:

..\Global\Client\Printers\AuxPrint\PrintPollDivisor

Increasing the setting should reduce the overhead imposed by the AuxPrint controller on other Global applications;

- A problem in the GSMRPC Client-Server interface that caused the Global Client to hang when attempting to access an inaccessible Global Server, has been fixed;
- The Console Executive has been enhanced to support a new operation that returns the Connection Status of a NETWORK port. This operation is called by a new \$STATUS "CLR" command (see section 2.9.1) which automatically restarts (i.e. clears) all failed connections;
- The Console Executive has been enhanced to support the new op-code required by the new CACND\$ sub-routine;
- A problem in the SVC-61 Find First File function has been fixed. This problem can cause unexpected results in the FILECONV List Directory option;
- The SVC-61 "Get Version" function has been enhanced to return the Windows major and minor version numbers, the Platform ID and the Build Number;
- A new SVC-61 operation has been implemented to return the actual amount of memory allocated dynamically by GSM (Windows);
- Although it is our intention to include an "enlarge sub-volume" facility in the GLDFMAIN.EXE utility this functionality has not been implemented yet. As a stop-gap solution, the GSM (DOS) GLENDDF.EXE utility is now distributed with GSM (Windows);
- The 32-bit diagnostics code has been rationalised. The following 2 registry settings:

..\Global\Client\Nucleus\SVC79Diagnostics
 ..\Global\Client\Nucleus\SVC79DiagLevel

are used as follows:

SVC79Diagnostics	SVC79DiagLevel	Meaning
Off	Don't care	Diagnostics disabled
On	0	Reserved for future use
On	1	Log SVC-79 hard errors
On	2	Log all SVC-79 errors
On	3	Log all SVC-79 operations
On	4	Reserved for future use
On	5	Reserved for future use
On	6	Reserved for future use
On	7	Reserved for future use
On	8	Reserved for future use
On	9	Reserved for future use

- The algorithm used to allocate 32-bit memory has been improved. In all versions prior to V2.9A, the memory for 32-bit pages was allocated within the size limit defined by the following registry setting:

..\Global\Client\MaximumMemory

This simplistic technique lead to the following warning message appearing unexpectedly on large multi-user configurations:

INITIATION WARNING 470 - 32-BIT SERVICES NOT AVAILABLE

For 16-bit only configurations this situation can be avoided by setting the following registry setting to "Off":

..\Global\Client\Nucleus\Enable32Bit

For 32-bit configurations, the memory for 32-bit pages is now allocated within the size limit defined by the following registry setting:

..\Global\Client\Nucleus\MaxMemory32Bit

Consequently, the relatively large amount of memory allocated for 16-bit memory-banks for large multi-user configurations will not impinge on the memory allocated for 32-bit pages;

- The 79-column restriction with GLCONS.EXE and GSMCONS.EXE (see below) when running on Windows 95 and 98 has been removed. It is now possible to use the 80-column TAP's (e.g. \$.730) with both GLCONS.EXE and GSMCONS.EXE on Windows-95 & 98.

IMPORTANT NOTE: Despite the special code to support this feature on Windows 95 & 98, the 80th character position on the baseline (i.e. line 24) remains reserved and cannot be used;

- A new telnet emulator, GSMCONS.EXE, has been released. Unlike the Global Windows Workstation (GSMWIN32.EXE), which is installed using a separate installation procedure, GSMCONS.EXE is automatically installed when the GSM (Windows) Global client is installed. Although internal, evaluation versions of this emulator have been released version V2.9A is first "official", external version. As the table at the start of this section indicates, GSMCONS.EXE is the "thin-client" version of the GLCONS.EXE non-GUI, full-screen "fat-client".

The GSMCONS.EXE emulator is configured by the GSMCONS.INI file (i.e. in the same way that GSMWIN32.EXE is configured by the GSMWIN32.INI file). However, the contents of the GSMCONS.INI file are considerably simpler than the complex GSMWIN32.INI file. Furthermore, the Common INI File and Customisation INI file options supported by GSMWIN32.EXE (see the Global Workstation Notes for further details) are NOT supported by GSMCONS.EXE.

The GSMCONS.INI file contains the following sections and options:

```
[tcpiipparameters]
HostID=192.168.1.109
Port=23

[miscellaneous]
ExitOn$E=On
KeyboardTimeout=0

[buffers]
DisplayBufferSize=512
```

```
SharedBufferSize=2048
ReceiveBufferSize=512
```

```
[printers]
AuxiliaryPrinter=COM13:38400,N,8,1,X
AuxPrinter0=COM1:38400,N,8,1,X
AuxPrinter1=COM2:38400,N,8,1,X
AuxPrinter2=COM3:38400,N,8,1,X
AuxPrinter3=COM4:38400,N,8,1,X
AuxPrinter4=COM5:38400,N,8,1,X
AuxPrinter5=COM6:38400,N,8,1,X
AuxPrinter6=COM7:38400,N,8,1,X
AuxPrinter7=COM8:38400,N,8,1,X
AuxPrinter8=COM9:38400,N,8,1,X
AuxPrinter9=COM10:38400,N,8,1,X
```

Important Note: Although comments are allowed in the GSMCONS.INI file each comment must start on a new-line. Comments on the same line as an entry are not allowed and effectively invalidate the entry. For example, the following comment format is allowed:

```
; This is a comment for the next line
ExitOn$E=On
```

Whereas the following comment format will generate an error when GSMCONS.EXE is loaded:

```
ExitOn$E=On ; This is a comment for the current line
```

The "HostID" and "Port" number select the GLOBAL.EXE (or GLCONS.EXE) host. If the "ExitOn\$E" option is enabled, GSMCONS.EXE will terminate automatically and disconnect telnet connection, when the operator runs the \$E command.

The options in the [buffers] section should not be amended, except under exceptional circumstances.

Auxiliary Printing (i.e back of screen printing) is supported by GSMCONS.EXE. The various options in the GSMCONS.INI file correspond to the value of the following setting in the registry of the host computer:

```
..\Global\Client\Printers\AuxPrint\5nn\ScreenType
```

ScreenType value sequence	Printer selected in GSMCONS.INI	Escape sequence
5	AuxiliaryPrinter	1B6Exx
10	AuxPrinter0	1B6D30xx
11	AuxPrinter1	1B6D31xx
12	AuxPrinter2	1B6D32xx
13	AuxPrinter3	1B6D33xx
14	AuxPrinter4	1B6D34xx
15	AuxPrinter5	1B6D35xx
16	AuxPrinter6	1B6D36xx
17	AuxPrinter7	1B6D37xx
18	AuxPrinter8	1B6D38xx
19	AuxPrinter9	1B6D39xx

Note that the printer selected by the GSMCONS.INI setting must be a

non-mapped, local DOS Device. The printer is opened for exclusive use when GSMCONS.EXE starts up and is only closed, and thus made available to other applications, when GSMCONS.EXE closes.

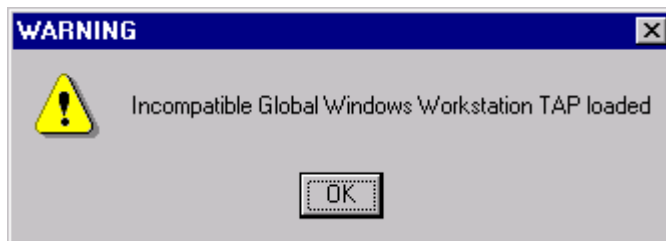
The rules that govern the full-screen and wide-mode options of GLCONS.EXE also apply to GSMCONS.EXE:

Option	Win-95/98	Win-NT
80th column position available (\$.730 etc.)	No	No
80th column position available (\$.731 etc.)	Yes ¹	Yes
full screen mode supported	Yes	Yes
full screen at start-up possible	No	Yes
132 wide window supported (\$.730 etc.)	No	No
132 wide window supported (\$.731 etc.)	Yes	Yes
132 wide full screen supported	No	No

In the above "\$.730" represents the family of TAP's that includes \$.730, \$.732 etc.; similarly "\$.731" represents the family of TAP's that includes \$.731, \$.733 etc.

Note-1: The 80th character position on the bottom line is NOT write-able when an 80-column TAP is used on Windows-95 and 98.

GSMCONS.EXE detects an attempt to load a Global Windows Workstation TAP (e.g. \$.711 or \$.712). When an incompatible TAP is loaded the following warning dialogue box will be displayed:



If this message appears run \$E immediately to re-load the correct TAP (e.g. \$.730 or \$.731 etc.). Please refer to the GSM (Windows) Configuration Notes for further details regarding the correct TAP's to use with GSMWIN32.EXE and GSMCONS.EXE.

GSMCONS.EXE supports the following option in the [miscellaneous] section of the GSMCONS.INI file:

KeyboardTimeout

When this option is specified, GSMCONS.EXE, introduces a small delay to ensure that there is a small time difference between receiving and sending characters over a TCP/IP link. This option should not be enabled under normal circumstances;

- A bug in the \$COMPRES SVC, SVC-80, has been fixed. This problem can cause a spurious WRITE FAIL error message to appear when uncompressing a file(s);
- GLOBAL.EXE now recognises the /Y command line option. When this option is enabled the registry key "AltServers" instead of the normal "Servers" key is used to obtain the connection information required to

access the various servers;

- Diagnostics have been added to the \$BYE handling to investigate a problem that can result in the Global Client hanging when \$BYE is run. The diagnostics, which are enabled by the following registry setting:

```
..\Global\Client\Enable$BYEDiagnostics
```

cause a log-file, byediags.log, to be created in the current directory;

- A new internal diagnostic option, SVC-90, has been included in GSM. This option is reserved for internal use only and is controlled by the following new settings in the registry:

```
..\Global\Client\Nucleus\SVC90FileName
..\Global\Client\Nucleus\SVC90Count
..\Global\Client\Nucleus\SVC90Length1
..\Global\Client\Nucleus\SVC90Length2
..\Global\Client\Nucleus\SVC90Length3
..\Global\Client\Nucleus\SVC90Length4
..\Global\Client\Nucleus\SVC90Length5
..\Global\Client\Nucleus\SVC90Length6
..\Global\Client\Nucleus\SVC90Length7
..\Global\Client\Nucleus\SVC90Padding
```

- The following registry setting is available to specify the “Data Type” of the document printed by the WinPrint controller:

```
..\Global\Client\Printers\WinPrint\5nn\StartDocDataType
```

This option is reserved for future use;

- The following new options in the registry are reserved for future use:

```
..\Global\Servers\FileExecValidation
..\Global\Servers\x\FileExecValidation
```

- A diagnostic option has been added to the Printer Executive to dump all the current Printer Translation Tables to a dump file, printdump.bin. This option is reserved for diagnostic purposes only;
- It is now possible to override the customisations within the \$MONITOR file by various settings in the following registry key:

```
..\Global\Client\Monitor
```

These advanced settings, which are currently reserved for future use, are outside the scope of this document. However, a complete description of this option can be found in a White Paper on the Technology section of the Global web-site (see www.global3000.com/varworld/technolo/whitepap.html);

- GLOBAL.EXE now recognises the following new registry settings:

```
..\Global\Client\Screens\GUI\Miscellaneous\TextSubstitutionFilenameVa
lidation
..\Global\Client\Screens\GUI\Miscellaneous>MainFramePositionWide
```

These options are reserved for specialised functions and should not be used.

5.10 GSM (Windows) BACNAT variant 2.9B

The V2.9B BACNAT repackaging for Global System Manager (Windows) includes the following features in GLOBAL.EXE:

- Both the V2.9 & V2.9A GLOBAL.EXE modules contain a bug that can result in a variety of symptoms when a particular coding technique in 16-bit Cobol or 16-bit Speedbase is used. The symptom of the problem is a TRAP AT 0000 or a fatal error 8 from the CCI.

The coding technique within a Cobol program or Speedbase frame involves CALLing or PERFORMing the next sequential line of code. For example:

```

        PERFORM LABEL1      * PERFORM SOME ROUTINE
LABEL1.      * FALL THROUGH TO DO IT AGAIN !!!
        (some code)        * CODE IN BODY OF ROUTINE
        EXIT                * EXIT FROM THE ROUTINE

```

However, the problem will not occur every time such code is executed. It will only occur if a time-slice swap occurs between LABEL1, in this example, and the EXIT statement.

The only example of this coding technique that we have found to date occurs in Sales Analysis.

However, all sites with the V2.9 or V2.9A GLOBAL.EXE are recommended to upgrade to V2.9B immediately.

5.11 GSM (Windows) BACNAT variant 2.9C

The V2.9C BACNAT repackaging for Global System Manager (Windows) includes the following features in GLOBAL.EXE:

- The V2.9C GLCONS.EXE client includes the fix to the problem described in section 5.10 (i.e. the problem described in section 5.10 was fixed in GLOBAL.EXE V2.9B and in GLCONS.EXE V2.9C);
- The problem that causes the GLOBAL.EXE Global client to ignore keyboard input, and appear to hang, if heavy displays are in progress has been fixed. This problem occurred in a variety of circumstances (e.g. when continual "in progress" messages are being displayed, during the Global Writer block delete dialogue).

5.12 GSM (Windows) BACNAT variant 2.9D

The V2.9D BACNAT repackaging for Global System Manager (Windows) includes the following features in GLOBAL.EXE and GSMCONS.EXE:

- A problem that resulted in a spurious "Error 123 from SetCurrentDirectory" when loading either GLOBAL.EXE or GLCONS.EXE, has been fixed. This problem, which is very dependent on the precise format of the command line argument, has only been reported in GLCONS.EXE although it could occur in GLOBAL.EXE;
- Both GLOBAL.EXE and GLCONS.EXE automatically create a "log" directory

immediately under the current Global directory. A small log file, bootdiags.log, is automatically created each time the Global client is loaded;

- The GUI module with GLOBAL.EXE has been upgraded to fix a problem that causes a General Protection Error (i.e. a complete crash) when exiting from an End-User System Request.

5.13 GSM (Windows) BACNAT variant 2.9E

The V2.9E BACNAT repackaging for Global System Manager (Windows) includes the following features in GLOBAL.EXE, GLCONS.EXE and GLSERVER.EXE:

- An apparent problem in the \$STATUS RES and CLR commands that leaves open files and outstanding locks on remote File Executives has been fixed. The solution to the problem involves each Global Client maintaining a "private" list of all the Global Servers that have been accessed. When a user on the Global Client is restarted, all the Global Servers that have been accessed by the client, based on the contents of the "private" list, are sent a Reset operation rather than the client relying on the (unreliable) SYLANF flag in the Global System Area. In V2.9E version of GLOBAL.EXE, this improved behaviour is enabled by the following registry setting:

```
..\Global\Client\IgnoreSYLANF
```

For the released V3.0 GLOBAL.EXE (see section 5.14, below) the "Ignore SYLANF" option is enabled by default so there should be no need to add this registry setting;

- Windows environment variables are now allowed in REG_SZ (i.e. string) registry values. An environment variable is indicated by enclosing the string in % characters. For example, if the Windows environment variable "GLOBALDIR" is set to "D:\PROGRAMS\GLOBAL" then setting a registry string value to "%GLOBALDIR%\GSM200" will result in the following string value:

```
D:\PROGRAMS\GLOBAL\GSM200
```

If the string enclosed in "%" characters is not a valid environment variable the string, including the two % characters, is returned as the registry value.

Windows environment variables are recognised by GLOBAL.EXE, GLCONS.EXE and GLSERVER.EXE. Windows environment variables are NOT currently recognised by SPEEDBAS.EXE or SPEEDSQL.EXE.

Important note 1: The automatic expansion is not performed for free-format, variable-text keys but only for string-values.

Important note 2: Do not confuse Windows environment variables, enclosed in "%" characters with the experimental Global registry settings starting with the "%" character that are mentioned briefly in section 5.9 and Appendix G;

- A new option to allow the name of a target Speedbase Gateway to be specified as a registry Value (i.e. rather than as a free-format, variable-text registry Key) is now available. It is possible to

specify the details of a Speedbase Gateway with the following registry settings:

```

..\Global\Client\Gateways\NN\GatewayServerName
..\Global\Client\Gateways\NN\ProtocolSequence
..\Global\Client\Gateways\NN\NetworkAddress
..\Global\Client\Gateways\NN\Endpoint
..\Global\Client\Gateways\NN\Port           (reserved      for
future use)

```

The notional index number NN (between 01 and 99) is purely descriptive and merely serves to allow multiple Gateways to be defined in the registry.

Compare the original registry format:

```

..\Global\Client\Speedbase\Server1\ProtocolSequence =
ncacn_ip_tcp
..\Global\Client\Speedbase\Server1\NetworkAddress = Server1
..\Global\Client\Speedbase\Server1\Endpoint = 3100

```

With the equivalent alternative format:

```

..\Global\Client\Gateways\NN\GatewayServerName = Server1
..\Global\Client\Gateways\NN\ProtocolSequence = ncacn_ip_tcp
..\Global\Client\Gateways\NN\NetworkAddress = Server1
..\Global\Client\Gateways\NN\Endpoint = 3100

```

Both the original and alternate registry settings are recognised by GLOBAL.EXE. However, when a connection to a Speedbase Gateway is requested, the various Client\Gateways\NN\GatewayServerName settings are considered before the Client\Speedbase\GatewayServerName settings.

Note that the new format allows the Speedbase server name to be specified as Windows Environment Variable (i.e. it is specified as a registry value rather than a registry key);

- The "gsmrpc" Client-Server interface, introduced with GLOBAL.EXE V2.8 (see section 5.8), has been enhanced to allow multiple clients to connect to a server using the "gsmrpc" option (the initial release only allowed single-client configurations). Several registry settings are required to enable the new multiple-client option.

For the Global Client, the following registry setting must be enabled:

```

..\Global\Client\EnableMultipleGSMRPC = On

```

For the Global server, the following registry settings must be enabled:

```

..\Global\Servers\EnableMultipleGSMRPC = On
..\Global\Servers\MultipleClientGSMRPCNN=xx

```

where NN (or N) is a unique number and xx is the node-id of a local client. For example, to enable "gsmrpc" for Global clients 27,28 and 29:

```

..\Global\Servers\MultipleClientGSMRPC1=27

```

```
..\Global\Servers\MultipleClientGSMRPC2=28
..\Global\Servers\MultipleClientGSMRPC3=29
```

- The device name of the WinPrinter print device is included in all API Error Messages displayed by the controller. This new feature should allow typo's in the Name setting to be detected more readily;
- The WinPrint controller has been enhanced to allow the name of the Windows print device for a particular printer number to be optionally modified according to the Screen Number. Thus, the following registry settings:

```
..\Global\Client\Printers\WinPrint\5nn\NameForScreenN
..\Global\Client\Printers\WinPrint\5nn\NameForScreenNN
```

overrides the normal "Name" setting for screen N or NN (N = 1 to 9; NN = 10 to 99):

Similarly, the following registry setting:

```
..\Global\Client\Printers\WinPrint\5nn\NameForNodeNN
```

overrides the normal "Name" setting for node-id NN (NN = 27 to 99). This setting is only recognised if the /EN command line argument has been used to override the default node-id.

In order for the override to be effective, the "Name" option must be set to a real printer (i.e. it must not be <blank> and the "DisableValidation" option **MUST** be disabled.

Note that screen numbers between 1 and 9 require registry settings "NameForScreen1" to "NameForScreen9" (i.e. rather than the normalised "NameForScreen01" to "NameForScreen09").

- An SVC-61 operation is available to return the Windows printer device for a particular Printer Number/Screen Number combination. A further SVC-61 operation returns details of the \$MonitorOverride option. Details of these specialised operations are beyond the scope of these notes.
- The following new diagnostic option has been added to the WinPrint printer controller:

```
..\Global\Client\Printers\WinPrint\5nn\WinPrintDiagnostics
```

When this option is enabled, the file "WinPrintDiagsNNN.log" (where NNN is the printer number) is created in the "log" directory. Note also that this registry setting has been moved for the V3.0 release (see section 5.13, below);

- More options have been added to the WinPrint printer controller. The following option ignores any errors that may be generated by the StartPagePrinter function:

```
..\Global\Client\Printers\WinPrint\5nn\IgnoreStartPageError
```

If this option is disabled any errors from the StartPagePrinter function will result in an ERROR H on the printer.

The following option causes the WinPrint controller to avoid both the StartPagePrinter and EndPagePrinter function calls:

```
..\Global\Client\Printers\WinPrint\5nn\SkipStartPageCall
```

In addition, the following option causes the WinPrint controller to issue a StartPagePrinter function call after every Form-Feed character:

```
..\Global\Client\Printers\WinPrint\5nn\StartPageAfterFormFeed
```

- The DOSPrint controller now includes the option to operate in Polled mode. This option is enabled by setting the following registry value to "on":

```
..\Global\Client\Printers\DOSPrint\5nn\PolledMode
```

The poll rate is controlled by the following setting:

```
..\Global\Client\Printers\DOSPrint\5nn\PrintPollDivisor
```

- The DOSPrint controller now includes a number of highly specialised settings.

The following option removes trailing <CR> characters from the output print file, for use with specialised data exports:

```
..\Global\Client\Printers\DOSPrint\5nn\RemoveCR
```

The following option removes trailing Form-Feed characters from the output print file. This option effectively removes hard page-breaks from the print file:

```
..\Global\Client\Printers\DOSPrint\5nn\RemoveFF
```

The following option enables the Tab Contraction/compression function:

```
..\Global\Client\Printers\DOSPrint\5nn\TabContract
```

The following option allows the default Tab Stop number to be changed from the default value of 8:

```
..\Global\Client\Printers\DOSPrint\5nn\TabPosition
```

All the above options have been added for specialised data export scenarios and should be used with extreme caution;

- The following new \$AUXPRI Screen Type values are supported:

Screen Type value	Printer Selected in GSMCONS.INI	Escape sequence
-------------------	---------------------------------	-----------------

20	AuxPrinter0	1B6F30
21	AuxPrinter1	1B6F31
22	AuxPrinter2	1B6F32
23	AuxPrinter3	1B6F33
24	AuxPrinter4	1B6F34
25	AuxPrinter5	1B6F35
26	AuxPrinter6	1B6F36

27	AuxPrinter7	1B6F37
28	AuxPrinter8	1B6F38
29	AuxPrinter9	1B6F39
30	AuxiliaryPrinter	1B6F40

These new escape sequences are followed by variable length print strings (which are terminated by the escape sequence 1B5B3469). Note that these new escape sequences are only supported by GSMCONS.EXE (i.e. they are not currently supported by GSMWIN32.EXE);

- The \$AUXPRINT controller now recognises ScreenType values higher than 100. A ScreenType value higher than 100 indicates that a Close Printer escape sequence must be sent to the terminal emulator for every Close Printer operation. When a ScreenType value higher than 100 is configured, 100 is subtracted from the value to obtain the "true" ScreenType value. For example, a ScreenType set to 105 indicates a ScreenType of 5 but with the Close Printer option enabled;

Important note: At the time of writing the Close Printer escape sequence is only supported on the V3.0 GSMCONS.EXE. This option is NOT supported in any version of GSMWIN32.EXE.

- The number of Printer Translations supported by the Printer Executive has been extended from 32 to 64 as required by the extensions to the V8.11 \$CUS utility (see section 2.10);
- The size of an internal Console Executive intermediate output buffer has been increased from 8 to 128 characters. This will increase display performance under some circumstances;
- The SVC-61 interface has been enhanced to provide a family of functions that provide full access to the Windows access to the Windows registry. The following functions are supported:

```

Test for registry value
Delete registry value
Test for registry key
Add new registry key
Delete registry key
Get registry DWORD value
Get registry REG_SZ value
Set registry DWORD value
Set registry REG_SZ value
Add registry DWORD value
Add registry REG_SZ value

```

For further details, please refer to the draft V8.2 File Converters Manual, which is available upon request;

- The SVC-61 interface has been enhanced to return the string value associated with a Windows Environment variable. For further details please refer to the draft V8.2 File Converters Manual, which is available upon request;
- GLSERVER now recognises the setting of the DiagnosticDisplays flag under all circumstances. The problem that resulted in the API Error message Box appearing when some errors occurred, regardless of the

DiagnosticDisplays setting, has been fixed. The default value for the DiagnosticDisplays flag is "Off";

- By default, the various \$MONITOR override values in the "Monitor" key do not attempt to override the \$MONITOR from a Starter System (i.e. from a BACRES). However, under some circumstances it may be necessary to override a Starter System. The following new value has been added to the "Monitor" key:

```
..\Global\Client\Monitor\StarterSystemOverride
```

- The following registry settings changes the Printer Control File (PCF) naming convention:

```
..\Global\Client\Nucleus\CentralPCFName
```

If this option is enabled, the Global Client node-id is ignored when building the name of the Printer Control File (PCF), regardless of the Printer Unit Number. That is, the PCF name is always \$\$P5nn, for all printers.

- The SVC-86 interface to GX has been enhanced to support fast, asynchronous GX operations. A problem in this area, that prevented the DOSPrint controller "PostCloseProgramName" option from functioning correctly, has been fixed;
- The SVC-61 interface maintains a table of the Windows files that have been opened by Global applications. When a Global application terminates, any Windows files that remain open are automatically closed by the "Reset" handling. This new functionality avoids the problem that can occur when a Global application opens a Windows file but does not close it cleanly (without the new option the Windows file would remain open until the Global client is restarted).
- The following registry setting can be used to alter the TCP/IP packet buffering:

```
..\Global\Client\Screens\Network\WinSockSendBufferSize
```

This option can be used to change the buffer size from any value between 256 bytes and 64Kb (the default is normally 8Kb). Note that changing this parameter is not generally recommended.

- The Printer Executive time-out value is automatically multiplied by a factor of 10 for \$AUXPRI printers. This is necessary to overcome a problem that results in spurious NOT READY errors with \$AUXPRI printers when large TCP/IP buffers are configured;
- SVC-80 has been enhanced to support the functionality required by the "chained sub-volume" option. This option is enabled by setting the #08 bit of the NUMBER OF EXTRA ASSIG\$ TABLES prompt in the NUCLEUS SECTION of the Global configuration file. Note that this obscure enabling technique has been superceded by a more obvious registry setting (i.e. +EnableUnitMapping) when the option to avoid the Configuration File has been enabled (see Appendix G);
- The Global Client now includes support for SVC-91. A description of this SVC, which provides access to an Extended 16-bit System Area,

is beyond the scope of these notes. The following registry setting allows the Extended System Area to be increased from the default size of 0 bytes:

..\Global\Client\Nucleus\ExtendedSystemAreaSize

Important Note: Previous versions of this document incorrectly stated that the default ExtendedSystemAreaSize is 256 bytes.

- The following new diagnostic option has been added to track the allocation and de-allocation of memory by GLOBAL.EXE:

..\Global\Client\EnableAllocMemoryDiagnostics

When this option is enabled, the file "allocmemdiags.log" is created in the "log" directory. Note also that this registry setting has been moved for the V3.0 release (see section 5.14, below);

- Internal changes to GLOBAL.EXE, GLCONS.EXE and GLSERVER.EXE to support the full range of File Executive operation codes, including a new Speedbase exclusive lock operation, have been implemented;
- A new option in GLSERVER.EXE allows the creation of a log-file containing all the messages that normally appear in the Global Server window. The name of the Global Server log-file is GLSERVERx.LOG (where x is the server letter). This option is enabled by setting the following registry option:

..\Global\Servers\EnableServerLogFile

Note that the default for this option is "on" (i.e. Server log files are created by default). Note also that this registry setting has been moved for the V3.0 release (see section 5.14, below);

- The Diagnostic "FD Logging" option in GLSERVER.EXE is now correctly recognised when the "gsmrpc" interface is used;
- The default 5 second timeout in GLOBAL.EXE when waiting for a response from a GLSERVER.EXE via the "gsmrpc" interface is now configurable. The following setting allows this timeout period to be modified from the default of 5 seconds:

..\Global\Client\GSMRPCTimeout

The V2.9E BACNAT repackaging for Global System Manager (Windows) also includes the following features in GSMCONS.EXE:

- An option to display "bright" colours (e.g. true yellow, rather than a dirty brown) is now supported in GSMCONS.EXE. A new [colours] section in the GSMCONS.INI file can include the following new settings:

```
BrightYellow
BrightWhite
BrightGreen
BrightBlue
BrightRed
BrightMagenta
BrightCyan
```

- The following new settings have been added to the [miscellaneous] section of the GSMCONS.INI file:

SendInitialEscape This option can be used to force the display of a sign-on screen by sending an <ESC> character when GSMCONS.EXE is initiated. This is typically required when GSMCONS.EXE is used to reconnect to a session that has been terminated by the use of \$E;

ConsoleTitlePrefix This setting allows a string of up to 40 characters to replace the default caption text of "Global Thin Client";

LogDisplays=On This option has been added to log all displays in a log-file "gsmconslog.bin".

Important Note: In the V3.0 GSMCONS.EXE (see section 5.14, below) the the LogDisplays option has been moved to [diagnostics] section of the GSMCONS.INI file;

- The following new settings have been added to the [tcpipparameters] section of the GSMCONS.INI file:

WinSockReceiveBufferSize This option allows the size of the TCP/IP receive buffers to be modified. By default, if this option is absent, the buffer size is 8Kb. This option may be used to set the buffer size to any value between 256 bytes and 64Kb.

NoDelay This setting optimises the transfer of small TCP/IP packets and may improve performance under some conditions.

- GSMCONS.EXE now supports the variable length "PCWS" format Auxiliary printer escape sequences in addition to the "Global Windows Workstation" format sequences described in section 5.9. The following new escape sequences are supported:

ScreenType value	Printer in GSMCONS.INI	On Seq.	Off seq.
30	AuxiliaryPrinter	1B 6F 40	1B 5B 34 69
20	AuxPrinter0	1B 6F 30	1B 5B 34 69
21	AuxPrinter1	1B 6F 31	1B 5B 34 69
22	AuxPrinter2	1B 6F 32	1B 5B 34 69
23	AuxPrinter3	1B 6F 33	1B 5B 34 69
24	AuxPrinter4	1B 6F 34	1B 5B 34 69
25	AuxPrinter5	1B 6F 35	1B 5B 34 69
26	AuxPrinter6	1B 6F 36	1B 5B 34 69
27	AuxPrinter7	1B 6F 37	1B 5B 34 69
28	AuxPrinter8	1B 6F 38	1B 5B 34 69
29	AuxPrinter9	1B 6F 39	1B 5B 34 69

Note-1: Simultaneous printing, using 2 different "variable length" auxiliary printer escape sequences will result in data corruption.

Note-2: For all types of auxiliary printer escape sequences, if the Device Name defined in the GSMCONS.INI file start with a "\" character, to specify a filename, all printer data will be written to file. For example:

```
AuxiliaryPrinter=\temp\auxprint.txt
```

GSMCONS.EXE now supports the following new setting in the [printers] section of the GSMCONS. INI file:

```
AuxPrinterBuffering
```

When this option is enabled characters for the auxiliary printer are blocked until the auxiliary printer off escape sequence has been received. Note that the printer buffer is flushed to the Print Device when it becomes full to allow for those applications that send an entire report etc. before sending the Auxiliary printing "Off" escape sequence.

The Windows API call (CreateFile) that is used to open the printer device specified by the AuxiliaryPrinter, AuxPrinter0, AuxPrinter1, ..., AuxPrinter9 settings fails if the printer is a captured network printer (e.g. LPT2:= \\globalnt1\tisljb). A second set of GSMCONS.INI file settings are now available to specify an auxiliary printer device that is a captured network printer:

```
NetworkPrinter
NetPrinterN          (N=0 TO 9)
```

These devices are opened using the OpenFile API call so the ":" character on the end of the device name is not required. For example:

```
AuxiliaryPrinter=LPT1:
NetworkPrinter=LPT1
AuxPrinter1=LPT2:
NetPrinter2=LPT2
```

Important Note: The absence of the ":" character in the device name specified for the NetworkPrinter and NetPrinterN settings is deliberate. The ":" character is required for the local DOS printers specified for the AuxiliaryPrinter and AuxPrinterN settings. The ":" characters is **NOT** required for captured network printers specified for the NetworkPrinter and NetPrinterN settings.

The NetworkPrinter and AuxiliaryPrinter settings are mutually exclusive, as are the NetPrinterN and AuxPrinterN (for any given N). This restriction is necessary because the same escape sequences are used to redirect output to the AuxiliaryPrinter and NetworkPrinter devices; and the AuxPrinterN and NetPrinterN devices.

- The GSMCONS.EXE Auxiliary Printer handling supports the Close Printer sequence sent by the host when the ScreenType option in the registry is set to 105 (see above). This option may be necessary to flush the data to a network printer (i.e. rather than waiting for GSMCONS.EXE to be closed).

Important Note: This option only applies to the primary NetworkPrinter and AuxiliaryPrinter devices. IT CANNOT BE USED WITH ANY OF THE secondary AuxPrinterN OR NetPrinterN devices.

5.14 GSM (Windows) BACNAT variant 3.0

The V3.0 BACNAT repackaging for Global System Manager (Windows) includes the following features in GLOBAL.EXE, GLSERVER.EXE and GLCONS.EXE:

- The current Production versions of the various Global System Manager (Windows) components are:

Module	Variant
GLOBAL.EXE	V3.0/V3.0
GLSERVER.EXE	V3.0
GLCONS.EXE	V3.0/V3.0
GSMCONS.EXE	V3.0
SPEEDBAS.EXE	V1.78
SPEEDSQL.EXE	V1.78

Important note: The changes and new features included in SPEEDBAS.EXE and SPEEDSQL.EXE V1.78 are documented in section D.13;

- The various changes described below have resulted in a vast proliferation of registry options. A document (GLMACH.DOC) describing all the Global registry options is being prepared. This document will be available on the Global web-site;
- The option to load a Global Client without accessing the Global Configuration File is now available. This option is enabled by setting the following registry option to "Off":

```
..\Global\Client\UseConfigurationFile
```

When this option is enabled all the Global Client configuration options are established via the registry. Please refer to Appendix G for further details.

To provide compatibility with installed systems the default value of this setting is "On";

Important note: The option to ignore the configuration file **MUST** be disabled when installing Global System Manager (i.e. the UseConfigurationFile setting must be set to "On" when loading from BACRES).

- The option to load a Global Server without accessing the Global Configuration File is now available. This option is enabled by setting either of the following registry options to "Off":

```
..\Global\Servers\x\UseConfigurationFile      (a)
..\Global\Servers\UseConfigurationFile      (b)
```

When this option is enabled all the Global Server configuration options are established via the registry. Please refer to Appendix G for further details. As explained in Appendix G, the server-specific option (b) takes precedence over the generic-server option (a) for a given Global Server.

To provide compatibility with installed systems the default values of both of these settings is "On";

- If the option to by-pass the Global Configuration File has been enabled for a Global Server (i.e. if the UseConfigurationFile setting is "Off") then no attempt is made to read from the GL-%-IPL.DLV file. Consequently, this IPL file is not required if the UseConfigurationFile setting is "Off";
- The lock table handling has been significantly enhanced to maintain a list of those users associated with Shared Locks. Central to the implementation of the improved Lock Table handling is the "Shared Lock Table". The following registry settings allow the size of the Shared Lock Table to be specified:

```

..\Global\Servers\x\+NumberOfSharedLockTableEntries
(a)
..\Global\Servers\+NumberOfSharedLockTableEntries
(b)
..\Global\Client\Nucleus\+NumberOfSharedLockTableEntries
(c)

```

The first setting (a) specifies the size of the Shared Lock Table for a particular server x (e.g. A, B etc.). The second setting (b) specifies the size of the Shared Lock Table for all servers that are not specified explicitly by a type (a) setting. The third setting (c) specifies the size of the Shared Lock Table for the local Global Client File Executive (i.e. when a GLOBAL.EXE or GLCONS.EXE is configured with a local DDF). The default number of Shared Lock Table entries is 2000. The Extended Shared Lock handling can be disabled by setting this value to 0.

In addition to the "server side" +NumberOfSharedLockTableEntries registry settings described above, the following "client side" registry setting (i.e. for GLOBAL.EXE and GLCONS.EXE) must be enabled to use the new \$STATUS "LKE" (Extended Lock) command (as described in section 2.10):

```

..\Global\Client\Nucleus\ExtendedSharedLocks

```

If the "client side" option (i.e. ExtendedSharedLocks) is enabled but the "server side" option (i.e. +NumberOfLockTableEntries=0) is disabled, a variety of problems, **including persistent "ERROR 0" messages when attempting the \$STATUS "LOC" or "LKE" commands** will occur. This should not represent a problem if all the Global components on a network (i.e. GLOBAL.EXE, GLCONS.EXE and GLSERVER.EXE) are V3.0. **However, a problem will occur if a V3.0 GLOBAL.EXE (or GLCONS.EXE) attempts to access a pre-V3.0 GLSERVER.EXE.** If the GLSERVER.EXE cannot be upgraded to V3.0 (i.e. to enable the "server side" +NumberOfSharedLockTableEntries option) then the "client side" ExtendedSharedLocks option **MUST** be disabled to prevent the Global Client making calls on the Global Server that are not available.

A complete description of these changes can be found in a White Paper on the Technology section of the Global web-site (see www.global3000.com/varworld/technolo/whitepap.html);

- The Global Server, GLSERVER.EXE, has been considerably improved to allow automatic File Executive resets (to close files and release exclusive locks and shared locks) when a Global Client disconnects,

reconnects and/or connects for the first time. The following new registry settings control these options:

```

..\Global\Servers\x\FileExecResetOnConnection           (a)
..\Global\Servers\x\FileExecResetOnReconnection        (b)
..\Global\Servers\x\FileExecResetOnDisconnection       (c)
..\Global\Servers\FileExecResetOnConnection           (d)
..\Global\Servers\FileExecResetOnReconnection          (e)
..\Global\Servers\FileExecResetOnDisconnection         (f)

```

The first group of three settings (a), (b) and (c) enable one of the automatic reset options for a particular server x (e.g. A, B etc.). The second group of three settings (d), (e) and (f) enable one of the automatic reset options for all servers that are not specified explicitly by the equivalent "single server" setting.

A complete description of these changes can be found in a White Paper on the Technology section of the Global web-site (see www.global3000.com/varworld/technolo/whitepap.html);

- The NETWORK controller has been enhanced to accept the Global Windows Workstation Identifier String (GIS) from the V3.0 Global Windows Workstation (see section A.3.17 of the V3.0 Global Windows Workstation Notes for full details). This option, which is enabled by default, is controlled by the following registry setting:

```
..\Global\Client\Screens\Network\AllowGUIReconnect
```

The default for this option is "On" for compatibility with the V3.0 Global Windows Workstation.

Important note-1: This option should be disabled if the thin-client emulator is either a pre-V3.0 version of GSMWIN32.EXE or any version of GSMCONS.EXE.

Important note-2: The command line /Z option that was used to enable this option in pre-release versions of GLOBAL.EXE has been removed from the V3.0 GLOBAL.EXE;

- A new Console Executive operation has been implemented to return the TCP/IP address in "dotted decimal" format (e.g. 192.168.1.234) of the computer running GSMWIN32.EXE in a thin client configuration. This option is only available if the "AllowGUIReconnect" option (see above) has been enabled;
- Several resellers have pointed out that the various diagnostics options in the Global registry are very difficult to locate. Consequently, it is very difficult to determine the diagnostics options that are currently enabled. This problem has been addressed by changing the format of the Global registry to include most of the diagnostics settings in a small number of registry keys. For V3.0, the complete list of diagnostic settings, all of which are disabled by default, is:

```

..\Global\Client\Diagnostics\DiagnosticDisplays
..\Global\Client\Diagnostics\LogConfigurationSynthesis
..\Global\Client\Diagnostics\Enable$BYEDiagnostics
..\Global\Client\Diagnostics\EnableAllocMemoryDiagnostics
..\Global\Client\Diagnostics\FileExecDiagnostics

```

```

..\Global\Client\Diagnostics\LogNetworkConnections
..\Global\Client\Diagnostics\SVC79Diagnostics
..\Global\Client\Diagnostics\SVC79DiagLevel
..\Global\Client\Diagnostics\LogExceptionLevel
..\Global\Client\Diagnostics\ConsoleDiagnostics
..\Global\Client\Diagnostics\ConsoleLogging.
..\Global\Client\Diagnostics\LogKeystrokes
..\Global\Client\Diagnostics\SVC86Diagnostics
..\Global\Client\Diagnostics\SVC90FileName
..\Global\Client\Diagnostics\SVC90Count
..\Global\Client\Diagnostics\SVC90LengthN
..\Global\Client\Diagnostics\SVC90Padding
..\Global\Client\Diagnostics\SVC61Diagnostics
..\Global\Client\Diagnostics\SVC61DiagUserNumber
..\Global\Client\Diagnostics\SVC61DiagShortOpcode
..\Global\Client\Diagnostics\SVC61SpeedbaseDiagnostics
..\Global\Client\Diagnostics\SVC61SpeedbaseDiagUserNumber
..\Global\Client\Printers\DOSPrint\5nn\Diagnostics\PostCloseDiagn
ostics
..\Global\Client\Printers\WinPrint\5nn\Diagnostics\WinPrintDiagno
stics
..\Global\Client\Screens\GLCONS\Diagnostics\InputCharacterDiagnos
tics
..\Global\Client\Screens\Network\nn\Diagnostics\LogIACSequences
..\Global\Server\Diagnostics\EnableServerLogFile
..\Global\Server\x\Diagnostics\EnableServerLogFile
..\Global\Server\Diagnostics\FileExecDiagnostics
..\Global\Server\x\Diagnostics\FileExecDiagnostics
..\Global\Server\Diagnostics\LogConfigurationSynthesis
..\Global\Server\x\Diagnostics\LogConfigurationSynthesis
..\Global\Server\Diagnostics\DiagnosticDisplays
..\Global\Server\x\Diagnostics\DiagnosticDisplays

```

The only diagnostics options that are not directly under a "Diagnostics" key are:

```

..\Global\Speedbase\DiagnosticDisplays
..\Global\Speedbase\DiagnosticLogfile
..\Global\Speedbase\LogFileFolder
..\Global\Speedbase\SpeedbaseLogFileFolder
..\Global\Client\Screens\GUI\Miscellaneous\LogDisplays
..\Global\Client\Screens\GUI\Miscellaneous\LogKeystrokes

```

See document GLMACH.DOC (when available) for further details;

- The various diagnostic options that create log files have been rationalised. All, except one, of the log files created by GLOBAL.EXE, GLCONS.EXE and GLSERVER.EXE are written to a "log" directory immediately under the "Global directory". For example, if the following option is enabled (see section 5.9):

```

..\Global\Client\Diagnostics\Enable$BYEDIagnostics

```

the V2.9 GLOBAL.EXE will create a log-file, byediags.log, in the current directory (e.g. D:\GSMNT), whereas the V3.0 GLOBAL.EXE will create the log file in D:\GSMNT\LOG. This allows all the Global generated log-files to be deleted by simply clearing a single Windows directory.

The only exception to this rule is the fontsize.txt file that is

created by the Global Windows Workstation (GUI) components within GLOBAL.EXE. For compatibility with GSMWIN32.EXE, this "font size description file" is created in the current directory.

Although most log-files are generated by the explicit setting of a registry option (e.g. Enable\$BYEDiagnostics) a small number of tiny log files are generated, in the log-directory, automatically. There is no way to suppress the creation of the following log-files:

```
..\log\bootdiags.log
..\log\gsminfo.txt
..\log\gsminfo.bin
```

- The "full screen" Global Client, GLCONS.EXE, has been enhanced to trap an attempt to close the application by clicking on the Close Box. If an attempt is made to close the Global Client, without running \$BYE, the familiar Windows "End Task" dialogue box will appear;

- The message sent to the thin-client by the NETWORK controller when no more ports are available has been changed from:

No more screens available on port NN

to the slightly more descriptive:

No more free connections (screens) available on port NN

- The following new registry setting is now available:

```
..\Global\Client\Screens\Network\DefaultTerminalType
```

This setting can be used to supply a default Terminal Type for all Network screen controllers that don't include the following explicit "screen specific" registry setting:

```
..\Global\Client\Screens\Network\NN\TerminalType
```

A single generic "all screens" DefaultTerminalType setting can be used instead of multiple "screen specific" TerminalType registry settings (i.e. one for each NN).

- The default value of the following registry setting:

```
..\Global\Client\IgnoreSYLANF
```

is now "On". See section 5.13 for further details.

- In order to prevent possible Windows NT "thrashing" problems, the Global Server Initiation/Start process, GLSSTART.EXE, delays for 1 second between each GLSERVER.EXE that is started. This option is controlled by the new /D command line setting. For example:

```
GLSSTART /ALL /D=1    Delay for 1 second (default)
GLSSTART /ALL /D=5    Delay for 5 seconds
GLSSTART /ALL /D=0    No delay (i.e. to pre-V3.0 mode)
```

- The message displayed by the "Network" screen controller when no more free connections are available on a given port has been

enhanced to include the User Number in addition to the (less useful) Console Index number. In addition, a 1 second delay has been added between sending this message and closing the connection, to allow the brief message to be read on the Global Windows Workstation screen;

- The SVC-61 interface has been enhanced to allow access to Windows shared memory-mapped files. For further details, please refer to the draft V8.2 File Converters Manual, which is available upon request;
- The SVC-61 interface has been enhanced to allow the Global client to function as a Windows Mailshot server. For further details, please refer to the draft V8.2 File Converters Manual, which is available upon request;
- The SVC-61 interface has been enhanced to allow the Global client to function as a Windows Mailshot client. For further details, please refer to the draft V8.2 File Converters Manual, which is available upon request;
- An internal change to the logic that controls the Windows files opened and closed by SVC-61 has been implemented. Any number of open file handles can now be accommodated. A new SVC-61 operation is available to determine the number of open file handles;
- The "bright colours" handling implemented in GSMCONS.EXE (see section 5.13, above) has been ported to GLCONS.EXE. The following new registry options are available:

```

..\Global\Client\Screens\GUI\GLCONS\Colour\BrightYellow
..\Global\Client\Screens\GUI\GLCONS\Colour\BrightWhite
..\Global\Client\Screens\GUI\GLCONS\Colour\BrightGreen
..\Global\Client\Screens\GUI\GLCONS\Colour\BrightBlue
..\Global\Client\Screens\GUI\GLCONS\Colour\BrightRed
..\Global\Client\Screens\GUI\GLCONS\Colour\BrightMagenta
..\Global\Client\Screens\GUI\GLCONS\Colour\BrightCyan

```

- A new file-name mapping option within the program loader is now available. This option allows a program name (e.g. \$I) to alias another (e.g. \$INSPECT). The mapping is controlled by matching pairs of options in the new FileNameMapping section of the registry:

```

..\Global\Client\FileNameMapping\FileNameMappingFromNN
..\Global\Client\FileNameMapping\FileNameMappingToNN

```

(where NN = 1 to 99). For example, to map a file-name of \$I to \$INSPECT; and \$SDL to \$SDL32:

```

..\Global\Client\FileNameMapping\FileNameMappingFrom1=$I
..\Global\Client\FileNameMapping\FileNameMappingTo1=$INSPECT
..\Global\Client\FileNameMapping\FileNameMappingFrom2=$SDL
..\Global\Client\FileNameMapping\FileNameMappingTo2=$SDL32

```

- The \$AUXPRI controller now allows up to 8 Auxiliary printers to be configured on a single ConsoleNumber. This is achieved by configuring all but the first \$AUXPRI for a given Console with an "AuxPrintPriority" setting:

```

..\Global\Client\Printers\AuxPrint\5nn\AuxPrintPriority

```

The AuxPrintPriority setting must be in the range 1 to 7 (i.e. a priority of 0 is assumed for the first printer on a given ConsoleNumber).

The pre-V3.0 \$AUXPRI controller ensures the ConsoleNumber is unique for all the configured \$AUXPRI printers. The V3.0 \$AUXPRI controller allows up to 8 \$AUXPRI printers to share the same ConsoleNumber. However, both the AuxPrintPriority and the ScreenType options must be unique for a given ConsoleNumber.

Important note: The terminal emulator MUST support multiple Auxiliary printers. At the time of writing, only the V3.0 GSMCONS.EXE supports multiple Auxiliary printers (see below).

Furthermore, up to 8 "floating" Auxiliary printers can be configured per screen. Each "floating" printer is set to the "real" Auxiliary printer with the same AuxPrintPriority setting;

An example should make this clear:

Unit	ConsoleNumber	AuxPrintPriority	ScreenType
500	2	0	10
501	2	1	11
502	2	2	12
503	2	3	13
504	3	0	10
505	3	1	11
506	3	2	12
507	3	3	13
590	0	0	
591	0	1	
592	0	2	
593	0	3	

The "floating" printer 590 is mapped to printer unit 500 on the screen with a ConsoleNumber of 2 and to 504 on the screen with a ConsoleNumber of 3. The "floating" printer 591 is mapped to printer unit 501 on the screen with a ConsoleNumber of 2 and to 505 on the screen with a ConsoleNumber of 3. The "floating" printer 592 is mapped to printer unit 502 on the screen with a ConsoleNumber of 2 and to 506 on the screen with a ConsoleNumber of 3. The "floating" printer 593 is mapped to printer unit 503 on the screen with a ConsoleNumber of 2 and to 507 on the screen with a ConsoleNumber of 3;

- The SVC-12 interface has been enhanced to support the extra functionality required by the \$SRCH32 utility;
- The \$BYE handling in the Network controller has been improved. The following new registry setting has been added to allow the \$BYE handling to continue if a Network connection cannot be reset successfully:

```
..\Global\Client\Screens\Network\Enable$BYEWatchdog
```

Enabling this option can **sometimes** cure the \$BYE hanging problem.

- The following registry setting is reserved for future use to log all the network connections:

```
..\Global\Client\Diagnostics\LogNetworkConnections
```

- The Console Executive has been enhanced to support the new operation required by the CLRTA\$ sub-routine;
- The Interpreter has been modified to return an Exception Condition 2 (rather than Exception Condition 8) when a 16-bit Monitor Page entry point is unavailable. This should result in the unique ILLEGAL PAGE debug message rather than the ubiquitous ILLEGAL JUMP debug message;
- The 8-bit character set handling of GSMCONS.EXE (see below) has been ported to GLCONS.EXE. The following options have been added:

```
..\Global\Client\Screens\GUI\GLCONS\Miscellaneous\Enable8BitMode
..\Global\Client\Screens\GUI\GLCONS\ISOTranslations\ToISOCharNNN
```

where NNN is a decimal number between 128 and 255.

Important Note: The ToISOCharNNN value-name in the registry that is recognised by GLCONS.EXE includes a decimal number in the key-word; whereas the ToISOCharHH key-word in the GSMCONS.INI file that is recognised by GSMCONS.EXE includes a hexadecimal number in the key name. However, both types of option expect a string in the form #HH, where HH is a hexadecimal number ;

- GLCONS.EXE also recognises the following new registry options:

```
..\Global\Client\Screens\GUI\GLCONS\Miscellaneous\CursorSize
```

This new setting overrides the original (slightly misplaced) setting:

```
..\Global\Client\Screens\GUI\CursorSize
```

- The V3.0 Global Windows Workstation Network controller includes an option to keep an internet connection "alive". This is achieved by periodically sending a special character sequence #1E20 to the host. The Network controller has been modified to soak-up these "Keep Alive" characters;
- The handling of the following options:

```
..\Global\Servers\FileExecValidation
..\Global\Servers\x\FileExecValidation
```

has been rationalised to be compatible with the other dual "server specific" and "generic server" settings. That is, if a "server specific" option is not in the registry then the "generic server" setting used;

- The specialised SVC-90 interface has been extended to include DMAM and Shared Lock diagnostics if the SVC90Number is set to 16;
- Notwithstanding the major changes to the Shared Lock handling described above, a new, diagnostic option has been implemented to maintain a list of all the users associated with a particular shared

lock. This option has been added to investigate a Hotline problem and should never be enabled under normal circumstances. The new options are:

```
..\Global\Servers\KeepSharedLocknodes
..\Global\Servers\x\KeepSharedLockNodes
```

- The Diagnostics entry on the Global Server (GLSERVER.EXE) menu bar now includes a "Dump Control Blocks" option. Each time this option is selected the File Executive creates a log-file called FileExecDump%.txt (where % is the server letter "A" to "Z"). Do not select this option unless explicitly advised to do so;
- The error reported when a read-only .SVL file is encountered has been changed from a SOFTWARE PROTECTION ERROR to a WRITE PROTECT ERROR;
- A highly specialised option is now available to trace problems with 32-bit applications:

```
..\Global\Client\Diagnostics\LogExceptionLevel
```

If this value is set to 1 a single-line record is written to the Exception.log file whenever an exception occurs. Note that a single Exception.log file is created by the Global Client. If this value is set to 3 two very large Exception Dump Files are created whenever any non-suppressed exceptions occur. The names of the Exception Dump Files are exedump_NN_UUU.log and exedump_NN_UUU.bin (where NN is the node-id and UUU is the User Number. The format of these dump files is beyond the scope of these notes. All other values are reserved for future use.

- The 32-bit interpreter has been enhanced to recognise the following new diagnostics options:

```
..\Global\Client\Diagnostics\LogHardResumeErrors
..\Global\Client\Diagnostics\LogSoftResumeErrors
..\Global\Client\Diagnostics\LogStackUnderOverflow
```

Do not enable these options unless explicitly advised to do so;

- The Console Executive has been enhanced to support the "Get Current Buffer Lengths" option required by the highly-specialised 32-bit "Open TFAM via Global Windows Workstation" Access Method;
- The LAN Executive and File Executive have been enhanced to support the 32-bit ULOCK\$ sub-routine. This sub-routine performs a "partial reset" by removing locks on all Global Servers that have been accessed by the user who is invoking the ULOCK\$ call;
- A new diagnostics option, FileExecDiagnostics, has been added to both the Global Server and the Global Client. This option, which generates a very large log-file, is reserved for internal use only. Note that the "server specific" setting:

```
..\Global\Server\x\Diagnostics\FileExecDiagnostics
```

is used in preference to the "generic server" setting:

..\Global\Server\Diagnostics\FileExecDiagnostics

- The "FD Logging" option on the Global Server Diagnostics menu is now correctly ticked when the option is enabled;
- The following registry option is available to alter the manner in which the Global client allocates and de-allocates memory. Enabling this option **may** prevent the hang that can occur when GLOBAL.EXE terminates following \$BYE:

..\Global\Client\AvoidMemoryTracking

- It has been recognised that a Windows "thread-switch thrashing" problem can occur when a Cobol or Speedbase application program performs continuous displays to the "GUI" console controller. This thrashing problem gives the appearance that GLOBAL.EXE has hung. For the V3.0 GLOBAL.EXE we have changed the manner in which display operations to the "GUI" controller are initiated. The new Initiate Display function, included in the V3.0 GLOBAL.EXE, involves one process thread sending another process thread an immediate message. However, we have discovered that this improved Initiate Display processing can actually degrade the performance of display operations to the "GUI" console on some laptop PC's (and potentially some desk-top PC's).

If displays to the "GUI" screen controller appear to be slower using the V3.0 GLOBAL.EXE compared with previous versions of GLOBAL.EXE then the following registry setting should be enabled to restore the original (i.e. pre-V3.0) Initiate Display processing:

..\Global\Client\Screens\GUI\SendImmediateMessage

- The following registry options are now recognised by the Global Windows Workstation V3.0 components within the V3.0 GLOBAL.EXE:

..\Global\Client\Screens\GUI\Colour\EEmailAddress
 ..\Global\Client\Screens\GUI\Colour\SpeedbaseA13Background
 ..\Global\Client\Screens\GUI\Colour\SpeedbaseA13Text
 ..\Global\Client\Screens\GUI\Colour\WebAddress

These new options, which are analogous to the equivalent options in the [colour] section of the GSMWIN32.INI file, are fully described in section A.4 of the Global Windows Workstation V3.0 Notes (MGUNV30.DOC);

- The following registry options are now recognised by the Global Windows Workstation V3.0 components within the V3.0 GLOBAL.EXE:

..\Global\Client\Screens\GUI\Miscellaneous\IgnoreSpeedbaseMode
 ..\Global\Client\Screens\GUI\Miscellaneous\LocalTempDirectory
 ..\Global\Client\Screens\GUI\Miscellaneous\MAPIInterface
 ..\Global\Client\Screens\GUI\Miscellaneous\SingleClickContextHelp
 ..\Global\Client\Screens\GUI\Miscellaneous\TextModeFontFile
 ..\Global\Client\Screens\GUI\Miscellaneous\TextModeFontWide
 ..\Global\Client\Screens\GUI\Miscellaneous\TextModeFontFileWide
 ..\Global\Client\Screens\GUI\Miscellaneous\WebBrowser

These new options, which are analogous to the equivalent options in the [miscellaneous] section of the GSMWIN32.INI file, are fully described in section A.7 of the Global Windows Workstation V3.0 Notes (MGUNV30.DOC);

- The following registry options are now recognised by the Global Windows Workstation V3.0 components within the V3.0 GLOBAL.EXE:

```
..\Global\Client\Screens\GUI\KeyMappings\EuroCharacterInput
..\Global\Client\Screens\GUI\KeyMappings\EuroCharacterOutput
```

These new options, which are analogous to the equivalent options in the [keymappings] section of the GSMWIN32.INI file, are fully described in section A.11 of the Global Windows Workstation V3.0 Notes (MGUNV30.DOC);

- The following registry options are now recognised by the Global Windows Workstation V3.0 components within the V3.0 GLOBAL.EXE:

```
..\Global\Client\Screens\GUI\Documentation\DocNN
```

where NN is a decimal number between 01 and 99. These new options, which are analogous to the equivalent options in the [documentation] section of the GSMWIN32.INI file, are fully described in section A.14 of the Global Windows Workstation V3.0 Notes (MGUNV30.DOC).

Important Note: The allowed values for the DocNN options recognised by GSMWIN32.EXE in the [documentation] section of the GSMWIN32.INI file are 01 to 99; whereas the allowed values for the DocNN options recognised by GLOBAL.EXE in the "documentation" key of the registry are 10 to 99;

- The following registry option must be added to use the Global Application Explorer (GX) thin-client option:

```
..\Global\Client\Nucleus\GXBufferSize
```

This option is described in more detail in the Global Application Explorer (GX) Notes;

- The following registry options are reserved for future use, and should NOT be used:

```
..\Global\Client\AllowClientReconnectionAllServers
..\Global\Client\Nucleus\ValueTrapTableEntries
..\Global\Client\Nucleus\Enable32BitExceptions
..\Global\Client\Nucleus\SYBIF1ReservedBit04
..\Global\Client\Nucleus\SYBIF1ReservedBit08
..\Global\Client\Nucleus\SYBIF1ReservedBit10
..\Global\Client\Printers\WinPrint\5nn\OpenViaSeparateThread
```

The V3.0 BACNAT repackaging for Global System Manager (Windows) also includes the following features in GSMCONS.EXE:

- GSMCONS.EXE now traps the Close Button on the Console application window. If a close is attempted when a TAP is loaded the standard Windows "Wait/End-Task/Cancel" dialogue box will appear;

- GSMCONS.EXE now includes support for 8-bit, "international character set" TAP's (e.g. \$.830). To enable the 8-bit character set option, the following setting must be included in the [miscellaneous] section of the GSMCONS.INI file:

```
Enable8BitMode=On
```

IF THIS OPTION IS ENABLED AN 8-BIT TAP (E.G. \$.830) MUST BE USED OTHERWISE THE KEYBOARD WILL NOT FUNCTION CORRECTLY.

In addition, the following specialised setting is available in the [diagnostics] section of GSMCONS.INI:

```
InputCharacterDiagnostics=On
```

DO NOT ENABLE THE InputCharacterDiagnostics OPTION UNLESS TOLD TO DO SO. Note that in pre-release versions of GSMCONS.EXE, this option was in the [miscellaneous] section of the GSMCONS.INI file.

A new [isotranslations] section has been added to GSMCONS.INI to allow input character translations to be specified by settings of the following format:

```
ToISOChar#nn=#hh
```

where nn is a hexadecimal character between 80 and FF and hh is any hexadecimal character.

The 8-bit character handling within Global System Manager assumes an ISO-8859 compliant character set. The various ToISOChar#nn settings, within the [isotranslations] section, allow a non-ISO-8859 compatible 8-bit character generated by the keyboard (when a non-ISO-8859 compliant code-page is being used) to be translated to an equivalent ISO-8859 character before transmission to the host. Note that most country-specific, international code pages are non-ISO-8859 compliant.

For every ToISOChar#nn=hh setting in the GSMCONS.INI file there should be an equivalent entry in the TRANSLATION section of the TAP. For example, suppose the ISO character #C0 appears as #84 in the code page (i.e. #84 is in the range #80 - #9F, which is reserved for control characters in the ISO-8859 character set). The following entry must be included in the [isotranslations] section of the GSMCONS.INI file:

```
ToISOChar#84=#C0
```

So that a byte-value of 84 (hex.) from the keyboard will be translated to a value of C0 (hex.) before being transmitted to the host. In the TRANSLATIONS section of the TAP, the following equivalent entry must be added:

```
C0 C0 84
```

In this TRANSLATIONS entry the first C0 is the input character value as seen from the host (i.e. after translation by GSMCONS.EXE). The second C0 is the ISO-8859 compliant internal character value (i.e. the character value that application programs will use). The 84 is the output character value (i.e. characters are translated from ISO-8859 to code-page standards by the host before being sent to

GSMCONS.EXE (i.e. GSMCONS.EXE does not need to include any output character translations).

Note that the hex value #DE is used as the lead-in for some foreign character sets. This hexadecimal value is ignored as an input keystroke.

- GSMCONS.EXE has been enhanced to suppress the display of Diagnostics Messages. By default, Diagnostic Messages are now suppressed. The display of Diagnostic Messages can be enabled by the following new setting in the [diagnostics] section of the GSMCONS.INI file:

```
DiagnosticDisplays =0n
```

Note that in pre-release versions of GSMCONS.EXE, this option was in the [miscellaneous] section of the GSMCONS.INI file;

- The Auxiliary Printing option in GSMCONS.EXE has been enhanced to support the Close Printer option. This option, which flushes the print data to a network printer by closing and re-opening the print device, is selected when a value of 100 is added to AuxPrint "Printer Type" registry setting, as described above;
- A new [diagnostics] section has been added to the GSMCONS.INI file. The following options have been moved from the [miscellaneous] section to the [diagnostics] section:

```
InputCharacterDiagnostics
LogDisplays
DiagnosticDisplays
```

- This list summarises the options in the GSMCONS.INI file that are recognised by the V3.0 GSMCONS.EXE:

```
[tcpipparameters]
HostID
Port=23
WinSockReceiveBufferSize
NoDelay=Off
```

```
[miscellaneous]
ExitOn$E=Off
KeyboardTimeout=0
SendInitialEscape=Off
ConsoleTitlePrefix=Global Thin Client
Enable8BitMode=Off
```

```
[buffers]
DisplayBufferSize=512
SharedBufferSize=2048
ReceiveBufferSize=512
```

```
[printers]
AuxiliaryPrinter
AuxPrinter
AuxPrinter1
AuxPrinter2
AuxPrinter3
AuxPrinter4
```

AuxPrinter5
AuxPrinter6
AuxPrinter7
AuxPrinter8
AuxPrinter9
AuxPrinterBuffering=On
NetworkPrinter
NetPrinter0
NetPrinter1
NetPrinter2
NetPrinter3
NetPrinter4
NetPrinter5
NetPrinter6
NetPrinter7
NetPrinter8
NetPrinter9

[colours]

BrightYellow=Off
BrightWhite=Off
BrightGreen=Off
BrightBlue=Off
BrightRed=Off
BrightMagenta=Off
BrightCyan=Off

[isotranslations]

ToISOChar#nn=#hh

[diagnostics]

InputCharacterDiagnostics=Off
DiagnosticDisplays=Off
LogDisplays=Off

5.15 GSM (Windows) BACNAT variant 3.1

The V3.1 BACNAT repackaging for Global System Manager (Windows) includes the following features in GLOBAL.EXE (note that this release does **NOT** include GLSERVER.EXE or GLCONS.EXE):

- The NETWORK screen controller has been enhanced to automatically detect a connection from the Global Application Explorer (GX.EXE). When a GX connection is detected the GSM start-up code interfaces directly with the GX sign-on dialogue box (i.e. instead of sending character strings to a non-GX thin-client emulator).

Important note: GLOBAL.EXE V3.1 is the first version of the Global Client that can be used with the released version (V2.0) of the Global Application Explorer;

- The default value of the following registry setting has been increased to 4000:

```
..\Global\Client\Nucleus\GXBufferSize
```

- The SVC-61 "DOS-compatible" Find First (#4E) and Find Next (#4F) functions have been supplemented by the equivalent "Windows 32-bit" functions: Extended Find First (#6E) and Extended Find Next (#6F). The extended operations return the full length, zero-terminated filename (up to 255 characters) in addition to the "8.3" DOS compatible filename.

Important note: These new, extended operations are used by the \$LICENCE and \$INSTALL utilities. Thus the V3.1, or later, GLOBAL.EXE must be used in order to install products from the Global Product Set (GPS) CD;

- The problem that causes a "pure NETWORK" configuration to soak up 100% CPU usage until the first user signs on, has been fixed. The problem only occurred when all the available consoles were in the NOT CONNECTED state. The problem has been fixed by allowing the first "Initiation Display" operation to complete, buffering the characters, when a console is marked as NOT CONNECTED;
- A problem in the WinPrint printer controller that caused occasional spurious "ERROR H" errors has been fixed. The problem only occurred when a low, nonzero Timeout value (e.g. 1) was configured;
- A problem with the option to by-pass the Global Configuration File (i.e. UseConfigurationFile=Off) has been fixed. The problem causes GLOBAL.EXE to crash if an attempt is made to access a DDF volume that is specified in the registry but not available when the Global Client is loaded. For example, if a configuration includes the following registry entry:

```
..\Global\Client\Data\DiscreteDataFile\DDF1=GSM260
```

but directory GSM260 is not present, the Global Client will crash if an attempt is made to access unit 260 etc.

- The DDF controller has been improved to allow UNC pathnames to be specified. For example:

..\Global\Client\Data\DiscreteDataFile=\\GLOBALSERVER\GSM\GSM200

Important Note: This version of the Global Client will NOT operate with Windows 95 OSR1.

- The Global Client SVC-61 interface has been enhanced to send Reset operations to the Speedbase Btrieve/SQL Gateway (SPEEDBAS.EXE). This enhancement ensures that the Speedbase Gateway can correctly close open files and clear outstanding locks when a user is restarted (e.g. when the \$STATUS RES, CAN or CLR commands are used).

Important note: The version of the Speedbase Gateway (SPEEDBAS.EXE) must be V1.81, or later, if the version of GLOBAL.EXE is V3.1, or later;

- A problem in the File Executive "Read Shared Lock" operation has been fixed. This problem caused a variety of unexpected results (e.g. no user associated with a shared lock) with the \$STATUS LKE operation;
- The arbitrary limit of 5000 for the Port number in the NETWORK screen controller has been removed;
- GLOBAL.EXE has been enhanced to accept the following new command line arguments:

```
/EO=oooo      Operator-ID
/ET=ttttt     Terminal type
```

The order of precedence for the GUI console default operator-id is:

```
/EO=oooo command line option
HKEY_CURRENT_USER\OperatorID
HKEY_LOCAL_MACHINE\Software\Global\Client\Screens\GUI\OperatorID
```

Note that the "..\GUI\OperatorID" setting was not included in the V3.0 GLMACH.TLT.

The order of precedence for the GUI console default terminal type is:

```
/ET=ttttt command line option
HKEY_CURRENT_USER\TerminalType
HKEY_LOCAL_MACHINE\Software\Global\Client\Screens\GUI\TerminalType
```

Note that the "..\GUI\TerminalType" setting was not included in the V3.0 GLMACH.TLT;

- A new function is now available to return the next Printer/Spooler-Unit combination from the table established using the following registry settings:

..\Global\Client\Printers\SpoolUnitForPrinter5nn

This option is reserved for use by the \$SPM utility.

- The <SYSREQ> V keystroke combination was reserved to enable diagnostics. This option has been re-instated to allow <SYSREQ> V (i.e. \$OV\$V) to be used as an (unofficial) end-user System Request;
- The following new registry option is now recognised:

```
..\Global\Client\Nucleus\LocalPCFName
```

This option, which sets the #04 bit of the internal System Variable SYBIF1, is reserved for future use;

- The Global Client, GLOBAL.EXE, has been enhanced to support a direct TCP/IP connection to the Speedbase Btrieve Gateway, SPEEDBAS.EXE, and Speedbase Btrieve NLM, SPEEDBAS.NLM. This new option is enabled by the following registry settings:

```
..\Global\Client\Gateways\nn\ProtocolSequence=gsmtcpip
..\Global\Client\Gateways\nn\Port=<port number of the
Gateway/NLM>
```

Note that the "Port" setting for the "gsmtcpip" protocol replaces the "Endpoint" setting for the various RPC protocols.

The following registry settings have the same meanings for the "gsmtcpip" protocol:

```
..\Global\Client\Gateways\nn\GatewayServerName=<server name of
the Gateway/NLM>
..\Global\Client\Gateways\nn\NetworkAddress=<network address of
the Gateway/NLM>
```

The following registry setting is also available for the "gsmtcpip" protocol:

```
..\Global\Client\Gateways\nn\EnableNoDelay
```

Important Note: The "gsmtcpip" option and " EnableNoDelay" setting are reserved for future use.

- A new function in the (unreleased) V3.1 Global Server (GLSERVER.EXE) that provides a TCP/IP "echo" facility has been implemented. This option is enabled using the following registry setting:

```
..\Global\Servers\N\ExtraTCP/IPEchoPort (sic)
```

This value, **which is reserved for future use**, should be set to the port number of the "echo port". A value of 0 disables this option;

5.16 GSM (Windows) BACNAT variant 3.2

The V3.2 BACNAT repackaging for Global System Manager (Windows) includes the following features in GLOBAL.EXE, GLSERVER.EXE and GLCONS.EXE (note that this release does **NOT** include GSMCONS.EXE). Note that GLOBAL.EXE V3.2 was immediately superseded by GLOBAL.EXE V3.2B to improve the interface to GX V2.2 (see below):

- The version of the Global Windows Workstation (GUI) module included in GLOBAL.EXE is V3.2. Thus, the full version number of GLOBAL.EXE is V3.2/V3.2. The inclusion of the V3.2 GUI module fixes a problem in GLOBAL.EXE that causes the optional bitmap wallpaper to resize incorrectly under some conditions;
- A long-standing problem in the 32-bit CCI that resulted in random STOP 1002, STOP 601 and various NO BASE errors in Partition-1 of Screen-1 (i.e. on the screen being used by User Number 1) has been fixed. The various exceptions on User Number 1 appeared to be random but could be correlated to other users running \$E;
- A *****VERY SERIOUS***** problem with the RPC interface on Windows 2000 has been fixed. The problem can cause NETWORK errors even on "local RPC" configurations. Other file-related problems may also occur. The problem only affects 32-bit programs, including \$MENU32. The problem appears as a spurious NETWORK ERROR. When the Diagnostic Displays option is enabled the following details are obtained:

```
..\vc0f.c Error 1734 from AA400 line 429
The array bounds are invalid.
```

- A problem with the handling of the GSMRPCTimeout option in the gsmrpc interface has been fixed. This problem manifested as a bug in \$V when allocating a new volume on a file server. The Allocate operation **appeared** to work but actually corrupted the OOSYSDOM.SVL file (and renamed it to 00xxxxxx.SVL, where xxxxxx was the name of the sub-volume that was being allocated). Furthermore, the first 3 sub-volumes were renamed to 01.SVL, 02.SVL and 03.SVL. The problem was caused by the gsmrpc time-out expiring during the relatively long Allocate operation. This has been fixed by returning a NETWORK ERROR if the time-out expires. Furthermore, the default time-out period has been increased from 5 seconds to 10 seconds. This obscure problem only appears to occur on slow hard-disks with FAT filing systems. Volume allocation on NTFS filing systems is usually extremely rapid;
- The GX interface has been significantly enhanced to support asynchronous receive operations and now maintains separate buffers for receives and transmits. The existing registry setting;

```
..\Global\Client\Nucleus\GXBufferSize
```

specifies the size of the transmit buffer (with a default value of 16384). The following new registry setting:

```
..\Global\Client\Nucleus\GXRXBufferSize
```

specifies the size of the receive buffer (with a default value of 4096);

- A number of display problems affecting the operation of 16-bit applications in GX window-0 have been fixed;
- The following options have been added to improve the performance of GX:

```

..\Global\Client\Screens\Network\NN\NoDelay      (single
channel)
..\Global\Client\Screens\Network\NoDelay        (all
channels)

```

THE NoDelay OPTION SHOULD BE ENABLED TO OBTAIN THE BEST PERFORMANCE FROM GX.

- The interface to GX has been improved to prevent the STOP 8628 condition that occurs if the GX output buffer fills up. However, for this change to be effective GSM SP-4 must be applied.

Important Note-1: The following registry option is pertinent for GLOBAL.EXE/GLCONS.EXE V3.2 and V3.2A if, **and only if**, GX is being used:

```
..\Global\Client\Nucleus\EnableSVC89
```

This setting is ignored by all versions of GLOBAL.EXE/GLCONS.EXE prior to V3.2. This means that if GX is being used, **GSM SP-4 cannot be used with any version of GLOBAL.EXE/GLCONS.EXE prior to V3.2.**

The setting **must** be set to "Off" (the default value) if GX is being used and the version of GLOBAL.EXE/GLCONS.EXE is V3.2, or V3.2A, and the GSM SP level is SP-3, or earlier.

The setting **must** be set to "On" if GX is being used and the version of GLOBAL.EXE is V3.2, or V3.2A, and the GSM SP level is SP-4, or later (otherwise a STOP 25018 will result when attempting to use GX).

The above rules only apply if GX is being used. The "EnableSVC89" registry setting has no meaning if GX is not being used.

Important Note-2: This complicated situation has been simplified by GLOBAL.EXE/GLCONS.EXE V3.2B, and later (see section 5.18). The level of the GSM Service Pack (i.e. SP-3, or earlier; or SP-4, or later) is automatically determined by GLOBAL.EXE/GLCONS.EXE V3.2B so that the "EnableSVC89" registry setting is not required (and will not be included in future versions of GLMACH.TLT).

The complex situation is summarised thus:

GSM SP level	GLOBAL.EXE/GLCONS.EXE	Comments
SP-3, or earlier 8628 may occur if small	V3.1, or earlier	OK but STOP the GX TX buffer is too (increase GXBufferSize)
SP-3, or earlier be "off"	V3.2 or V3.2A	EnableSVC89 must STOP 8628 may occur if

the GX TX buffer is too small (increase GXBufferSize)

SP-3, or earlier V3.2B, or later OK
(EnableSVC89 will be ignored)

but STOP 8628 may occur if the GX TX buffer is too small (increase GXBufferSize)

SP-4, or later V3.1, or earlier Fails with STOP
25018 if GX used

SP-4, or later V3.2 or V3.2A EnableSVC89 must be
"on"

otherwise STOP 25018 will occur;
STOP 8628 problem fixed

SP-4, or later V3.2B, or later OK (EnableSVC89
will be ignored)

and STOP 8628 problem fixed

- The V3.2 Global Clients (GLOBAL.EXE and GLCONS.EXE) recognise GX connections for E-commerce users (see Appendix K for further details);
- The Console Executive "Get Next Block" operation has been enhanced to allow a variable block size. This should speed up GX operations under all conditions; and display operations, under some conditions;
- A problem in the \$BYE handling that resulted in GLOBAL.EXE crashing has been fixed. This problem was caused by a bug in the WinPrint controller shut-down logic;
- A problem with the handling of the following registry setting:

..\Global\Client\Printers\WinPrint\5NN\Timeout

that could result in a spurious ERROR-H has been fixed;

- The following new registry settings can be used to enable the Concurrent GUI option on a selective basis:

..\Global\Client\Screens\GUI\ConcurrentGUI (a)
 ..\Global\Client\Screens\Network\NN\ConcurrentGUI (b)
 ..\Global\Client\Screens\Network\ConcurrentGUI (c)
 ..\Global\Client\Screens\Serial\NN\ConcurrentGUI (d)
 ..\Global\Client\Screens\Serial\ConcurrentGUI (e)

Note that option (b) takes precedence over (c); and (d) takes precedence over (e). These new settings should NOT be mixed with the existing:

..\Global\Client\Nucleus\ConcurrentGUI

which takes precedence over all of them.

- The Serial Port Driver (SPD) interface is now supported on GSM (Windows). Further details of the specialised interface are available on the Technical Note section of the Global web-site;
- The DOSPrint interface includes support for the PRIFN\$ sub-routine. This sub-routine allows an application to specify the precise Windows filename of the next file to be printed by a particular user on a particular printer. The following registry setting must be enabled in order for the PRIFN\$ file name to be recognised by a printer:

```
..\Global\Client\Printers\DOSPrint\5NN\DynamicFileName
```

- A problem in GLOBAL.EXE that results in a crash when (un-tested) programs or utilities perform illegal operations on un-initialised FD's has been fixed;
- The following new registry option is available:

```
..\Global\Client\Screens\Serial\DefaultTerminalType
```

to provide a default Terminal Type for all those serial devices that do not have explicit registry settings:

```
..\Global\Client\Screens\Serial\NN\TerminalType
```

- The Global Client, GLOBAL.EXE, now recognises the following command line argument to introduce a small delay before accessing any Global Servers:

```
/V=nn
```

where nn is the delay time, in seconds. This option, which should be regarded as a stop-gap until GLSERVER.EXE is available as an NT Service, gives any Global Servers the chance to initialise before being accessed by the Global Client.

- The following new registry settings are now recognised by the IDF controller:

```
..\Global\Client\Data\IntegratedDataFiles\Drive\ImmediateClose
..\Global\Servers\x\Data\IntegratedDataFiles\Drive\ImmediateClose
```

If this option is enabled the IDF volume is closed immediately after every read or write operation. This option is expected to be useful when transferring files between GSM (Windows) and GSM (Unix).

- The IDF controller also recognises the following new registry setting:

```
..\Global\Client\Data\IntegratedDataFiles\Drive\VirtualDiskette
..\Global\Server\x\Data\IntegratedDataFiles\Drive\VirtualDiskette
```

If this option is enabled the IDF volume is NOT dynamically sized at initialisation time. This option is useful for transferring files between GSM (Windows) and GSM (Unix). Note that "incorrect transfer

length" errors are suppressed for Virtual Diskettes for Read operations.

- SVC-61 has been enhanced to support the following DOS compatible functions:

#2A Get System date from Windows (same as the equivalent DOS call)
 #2B Set System date (same as the equivalent DOS call)
 #2C Get System time from Windows (superset of the equivalent DOS call)
 #2D Set System time (same the equivalent DOS call)

- In addition, SVC-61 has been enhanced to support the following new functions

#70 Create new Windows process
 #63 Format Windows error number to a verbose message

SVC-61 function #70 is a direct replacement for the SVC-70 interface.

At the time of writing, the draft File Converters V8.2 Manual is being updated to include full details of all these new operations. When these changes have been completed the draft FC8.2 manual will be available on the Technology section of the Global web site.

The following changes and enhancements are documented for completeness only. In general, these options should not be used or required:

- The following option has been added:

..\Global\Client\Screens\Network\NN\SendIACsequence

This highly-specialised option allows a byte-string to be sent to the thin-client or terminal emulator immediately the telnet connection has been made. This option has been introduced to allow the NETWORK controller to send telnet "Interpret as Command" (IAC) sequences to the terminal emulator. **DO NOT USE THIS OPTION IF THE TERMINAL EMULATOR IS GSMWIN32.EXE, GSMCONS.EXE OR GX.INI;**

- The handling of the following highly-specialised registry setting:

..\Global\Client\Screens\Network\NN\Diagnostics\LogIACSequences

has been modified to write the log-file "iaclogNN.bin" log directory rather than log-file "keylogNN.bin" in the current directory;

- The Console Executive now supports a diagnostic option to dump the state of the GX buffers and control information to the log-file \log\cacbsvc86dump.log. This operation is reserved for internal use only;
- GLSERVER.EXE has been modified to allow a "MasterNodeID" of "*". This setting, which is reserved for future use, by-passes the Master Node-id validation code;
- The following highly-specialised registry setting:

..\Global\Client\Screens\Network\NN\Diagnostics\LogConsoleDisplay
S

enables a new diagnostic option in the Network controller to log all out-going characters to the log-file "networkdisplayNN.bin" in the log directory;

- The following registry option is reserved for internal use:

..\Global\Client\Printers\WinPrint\5NN\AdminSystemOrderDirectory

- The GSM (Windows) SVC-61 interface includes support for a highly-specialised interface to a particular Windows DLL (DBX.DLL). This interface will be extended to provide a generic interface to Windows DLL's;
- A new SVC, SVC-88, is now available to invoke SVC-61 operations without waiting for an immediate response. The following registry option alters the poll rate associated with SVC-88:

..\Global\Client\Nucleus\SVC88PollDivisor

SVC-88 is currently reserved for future. **DO NOT ATTEMPT TO USE IT;**

- The following highly-specialised registry setting has been withdrawn:

..\Global\Client\Diagnostics\LogNetworkConnections

- The following registry settings are reserved for internal use only:

..\Global\Client\Screens\GUI\SpecialEcommerceUser
 ..\Global\Client\Screens\GUI\SpecialSupportUser
 ..\Global\Client\Screens\GUI\SpecialTextOnlyUser
 ..\Global\Client\Screens\Serial\NN\SpecialEcommerceUser
 ..\Global\Client\Screens\Serial\NN\SpecialSupportUser
 ..\Global\Client\Screens\Serial\NN\SpecialTextOnlyUser

USE OF THESE REGISTRY SETTINGS WILL PRODUCE UNPREDICTABLE RESULTS.

5.17 GSM (Windows) BACNAT variant 3.2A

The V3.2A BACNAT repackaging for Global System Manager (Windows) includes the following features in GLOBAL.EXE only (note that this release does **NOT** include GLSERVER.EXE, GLCONS.EXE or GSMCONS.EXE). Note that GLOBAL.EXE V3.2A was immediately superseded by GLOBAL.EXE V3.2B to improve the interface to GX V2.2 (see below):

- A problem that resulted in GX appearing to hang under some conditions has been fixed in the V3.2A version of GLOBAL.EXE. **All users running with GX should be using V2.3A GLOBAL.EXE, or later (see section 5.18);**

5.18 GSM (Windows) BACNAT variant 3.2B

The V3.2B BACNAT repackaging for Global System Manager (Windows) includes the following features in GLOBAL.EXE and GLCONS.EXE (note that this release does **NOT** include GLSERVER.EXE or GSMCONS.EXE):

- GLOBAL.EXE/GLCONS.EXE V3.2B automatically determines the level of the GSM Service Pack (i.e. SP-3, or earlier; or SP-4, or later) so the "EnableSVC89" registry setting (see section 5.16) is not required.

ALL USERS RUNNING GX ARE RECOMMENDED TO UPGRADE TO GSM SP-4 AND GLOBAL.EXE/GLCONS.EXE V3.2B TO AVOID THE STOP 8628 CONDITION THAT CAN OCCUR OCCASIONALLY IF THE GX TRANSMIT BUFFER FILLS UP;

- The following registry settings allow the time-out period on "true" RPC operations (e.g. when using the "ncacn_ip_tcp" Protocol Sequence) to be specified:

..\Global\Client\Servers\RPCTimeout	(interface to all
RPC servers)	
..\Global\Client\Servers\x\RPCTimeout	(interface to
single RPC server)	

The timeout value can be any integer value from 0 to 10:

- 0 Try the minimum amount of time for the network protocol being used. This value favors response time over correctness in determining whether the server is running;
- 1 - 4 Behaviour (proportionally) between a value of 0 and 5;
- 5 Try an average amount of time for the network protocol being used. This value gives correctness in determining whether a server is running and gives response time equal weight. This is the default value;
- 6 - 8 Behaviour (proportionally) between a value of 5 and 9;
- 9 Try the longest amount of time for the network protocol being used. This value favors correctness in determining whether a server is running over response time.
- 10 Keep trying to establish communications forever;

Important Note-1: The values are not in seconds. These values represent a relative amount of time on a scale of zero to 10.

Important Note-2: The "RPCTimeout" registry setting is ignored if the Protocol Sequence is "gsm!rpc". If the Protocol Sequence is "gsm!rpc" the "..\Global\Client\GSMRPCTimeout" registry setting must be used to adjust the time-out value (in seconds).

5.19 GSM (Windows) BACNAT variant 3.2C

The V3.2C BACNAT repackaging for Global System Manager (Windows) includes the following features in GLOBAL.EXE and GLCONS.EXE (note that this release does **NOT** include GLSERVER.EXE or GSMCONS.EXE):

- GLOBAL.EXE has been enhanced to allow Asymmetric Multiple Clients (i.e. multiple copies of GLOBAL.EXE can be used on the same PC with different registry settings). This option is enabled using the /G option. By default, GLOBAL.EXE only recognises registry Keys and ValueNames under the following registry key:

```
HKEY_LOCAL_MACHINE\Software\Global\Client\
```

The /G option allows the "Global" registry key to be over-ridden by an alternative key. For example, the following command line:

```
C:\GSM\GLOBAL.EXE C:\GSM\GSM200 /G=GlobalSpecial
```

will result in the new instance of GLOBAL.EXE to use the following registry key:

```
HKEY_LOCAL_MACHINE\Software\GlobalSpecial\Client\
```

This option is currently of limited use because neither GLSERVER.EXE nor GLREGED.EXE have been enhanced to support alternative registry keys;

- SVC-88 has been enhanced to allow \$STATUS to report "WAITING FOR SVC 88 OPERATION";
- A new SVC-61 function (DSOPC = #65), to return a fixed Boolean value from the "Customisations" section of the registry, is now available. This new function is fully described in the Global File Converters Manual;
- A new SVC-61 function (DSOPC = #66), to test a string for a valid Boolean value, is now available. This new function is fully described in the Global File Converters Manual;
- A problem introduced with the release of GLOBAL.EXE V3.2, that ignores the "FileNameMappings" option, has been fixed;
- Use of the following registry setting has been rationalised:


```
..\Diagnostics\LogExceptionLevel
```
- A problem which caused GX sessions to stop unexpectedly with a STOP 8623 has been fixed;
- The "gsmtcpip" interface between GSM (Windows) GLOBAL.EXE and the GSM (Novell) Speedbase NLM (SPEEDBAS.NLM) has been enhanced to allow the familiar "Endpoint" setting to be used instead of the new "Port" setting. This provides some backwards compatibility with the interface between GLOBAL.EXE and SPEEDBAS.EXE. Note that the Port setting takes precedence over the Endpoint setting if both options are included in the registry. Note also that the Endpoint is a string (REG_SZ) value while the Port is a numeric (REG_DWORD) value;

- The following registry setting has been re-instated:

```
..\Diagnostics\LogNetworkConnections
```

this option writes a separate, highly detailed file for each different Port that has been configured for a Network controller. Each "connection" diagnostic file is named:

```
..\log\networkconnectsforport_NNNN.log
```

where NNNN is the Port number. For example, on a system that is configured with Network consoles on ports 23, 24, 25 and 26 the following files will be created:

```
..\log\networkconnectsforport_23.log
..\log\networkconnectsforport_24.log
..\log\networkconnectsforport_25.log
..\log\networkconnectsforport_26.log
```

Furthermore, a new diagnostic option:

```
..\Diagnostics\LogNetworkDisConnections
```

logs any errors that occur as thin-clients are disconnecting. Each "disconnection" diagnostic file is named:

```
..\log\networkdisconnectsforport_NNNN.log
```

- The various registry access routines in GLOBAL.EXE have been enhanced to ignore any string setting that starts with a "~" (tilde) character. This provides a convenient way to disable a registry setting **without** removing the entry entirely. For example:

```
..\Printers\WinPrint\500\~ComplexPrinterNameThatIDontWantToDelete
```

This option is only available for string (REG_SZ) settings. It is not available for numeric (REG_DWORD) settings;

- A number of new, highly-specialised options have been added to the DOSPrint controller:

```
..\Global\client\Printers\DOSPrint\5nn\PrintViewDirectory
..\Global\client\Printers\DOSPrint\5nn\PrintViewExtension
..\Global\client\Printers\DOSPrint\5nn\PrintViewAddExtension
..\Global\client\Printers\DOSPrint\5nn\PrintViewTimeout
..\Global\client\Printers\DOSPrint\5nn\PrintViewFileCopyBufferSize
```

These options should not be enabled unless a "Print View sub-system" has been installed on the server that is running GLOBAL.EXE;

- A problem in GLOBAL.EXE V3.2 that resulted in occasional displays of the spurious messages "Something has gone wrong" and "Partial Send" has been fixed in GLOBAL.EXE V3.2C. These messages, which were included in GLOBAL.EXE for diagnostic purposes, will only appear if the followed registry key is set to "on":

```
..\Global\Client\Diagnostics\EnableSpecialNetworkDiags
```

5.20 GSM (Windows) BACNAT variant 3.3

The V3.3 BACNAT repackaging for Global System Manager (Windows) includes the following features in GLOBAL.EXE, GLCONS.EXE, GLSERVER.EXE and GSMCONS.EXE:

As will be announced in the GLOBAL.EXE V3.3 release notes, the standard version of GLOBAL.EXE V3.3 will only be supported on the OSR2 version of Windows-95. This new version of GLOBAL.EXE uses a number of Microsoft interfaces that are not supported on Win-95 OSR1. These interfaces are available in ALL versions of ALL the other supported versions of Windows (e.g. Win-98, Win NT, Win 2000 etc.).

The most significant interface that is not supported on Win-95 OSR1 is the function that allows GLOBAL.EXE & GLSERVER.EXE to access networked directories via UNC files names (e.g. \\mainserver\global\gsm200) rather than relying on mapped network drives.

However, a Win-95 OSR1 compliant version of GLOBAL.EXE V3.3 will be available, on request (and via the web site) albeit with slightly limited functionality.

I've attached the RC-18 version of this Win-95 OSR1 compliant GLOBAL.EXE.

6. KNOWN PROBLEMS IN GLOBAL SYSTEM MANAGER V8.1

The following reported problems in Global System Manager V8.1 have not been fixed:

- All standard GSM (DOS) and GSM (Novell) configurations include a DOS.PRI printer controller at unit address 500. If this printer is selected as the default printer during GSM installation, printer unit 500 is customised (as a DOS.PRI printer) during the installation process. If Global Configurator is subsequently used to change printer unit 500 to a serial printer (e.g. printer controller S.PRINT or PCC/I) the "stale non-serial" customisation options continue to override the new serial printer details in the configuration file. Typically, these "non serial options" result in a baud-rate of 0 and a Printer Characteristics byte of #00, which prevent the serial interface from working correctly. The work-around is to use \$CUS to remove the customisation for printer 500 if Global Configuration is used to change the controller code (e.g. from DOS.PRI to S.PRINT). For example:

The screenshot shows a window titled "Global System Manager" with a menu bar containing "Window", "Edit", "Functions", "Options", and "Help". The main display area shows the following text:

```

Global System Manager                                Tuesday 19/09/00 17.01

                GSM CUSTOMISATION
                -----
                PRINTER CUSTOMISATION
                -----
Printer page size . . . . . 1
Printer characteristics . . . . 2
Printer control file. . . . . 3
Exit. . . . . <CR>

Please select a function      :2

Set up device attributes for a printer unit.

PRINTER UNIT:500^A
Delete printer customisation for 500 (Y)?:Y  CUSTOMISATION DELETED - Key <CR>:_
  
```

The status bar at the bottom of the window shows "Partition 1 Computer CA" and a "CAPS" indicator.

Obviously, the problem can affect any printer, not just unit 500, which has been customised by \$CUS then subsequently modified by CFUPDATE;

- After installing a V8.11 GSM non-PM configuration the following message will appear when reloading GSM:

YOU ARE ATTEMPTING TO RUN A 32-BIT APPLICATION WHICH
REQUIRES A VALID 32-BIT SERVICE LICENCE.

For example:

The screenshot shows a terminal window titled "Global System Manager" with a menu bar containing "Window", "Edit", "Functions", "Options", and "Help". The main area of the terminal displays the following text:

```
PLEASE KEY YOUR OPERATOR-ID:ALAN
PLEASE KEY TERMINAL CODE (712 ):

YOU ARE ATTEMPTING TO RUN A 32-BIT APPLICATION WHICH
REQUIRES A VALID 32-BIT SERVICE LICENCE.

$94 YOU ARE NOT AUTHORIZED TO SIGN ON - PLEASE CONTACT A SUPERVISOR
OPERATOR ALAN SIGNED OFF AT 17.42.55
PLEASE KEY YOUR OPERATOR-ID: _
```

The status bar at the bottom of the window shows "Partition 1 Computer CA" on the left and "CAPS" on the right.

This message is caused by a bug in a GSM start-up overlay, which will be fixed in GSM V8.1m. A work-around for GSM non-PM sites, which will not be running 32-bit applications, is to switch off the 32-bit run-time by setting the following registry setting to "Off":

```
..\Software\Global\Client\Nucleus\Enable32bit
```

All GSM non-PM sites, that will be running 32-bit applications, must obtain a valid Service password from the Service Centre.

- A program with the \$STATUS PUR command, that can result in a corrupt \$\$USER file, is being investigated. Until this problem has been resolved **IT IS ABSOLUTELY VITAL TO TERMINATE THE GLOBAL SYSTEM MANAGER SESSION (USING \$BYE OR \$STATUS/TER) ON ALL COMPUTERS OR SYSTEMS IN A CONFIGURATION BEFORE RE-BOOTING THE MASTER COMPUTER AFTER THE \$STATUS/PUR COMMAND HAS BEEN USED;**
- All V8.1 GSM (MS-DOS) configurations include a single SSD-FILE simulated hard-disk with volume format T259Z. Some existing V7.0 and V8.0 sites are using volume format T151Z. An ERROR Z will result if

an attempt is made to access a T151Z volume as format T259Z.

A new GSM (MS-DOS) utility, GLUPDDF, is available on the BBS to upgrade a "T151Z" format MS-DOS directory (e.g GSM200) to the "T259Z" structure.

- GSM V8.1 is distributed on high-capacity diskettes. For 3.5" formats GSM V8.1 is distributed on 1.44Mb "O2A" format diskettes. Some existing V7.0 and V8.0 systems were installed from 720Kb "B3B" format diskettes. Such sites have the \$BA logical unit assigned to physical unit 170 (i.e B3B format). If a "B3B" site is upgraded to GSM V8.1 and the save/restore customisation option is selected, after the installation of GSM V8.1, \$BA will remain assigned to 170 (i.e. format "B3B") rather than 140 (i.e. format "O2A"). Several GSM utilities (e.g. \$CUS) expect the BACRES, BEA, HAA etc. diskettes to be accessible as unit \$BA and will fail if this logical assignment is incorrect.

This problem can be easily solved by using the \$CUS Permanent Unit Assignment option to set \$BA to 140 (and reloading GSM). Alternatively, the following post restore customisation job, \$\$\$JOB, can be used to set \$BA=140 automatically during the upgrade installation:

```
JOB    $$$JOBSet $BA to 140
DIALOG DIVISION
:$CUS :2 :8 :$BA :140 :<CR> :<CR> :<CR>
ENDJOB
```

- After installing GSM V8.1, the library stubs to the Development Libraries are deleted.

There are no plans to fix this "problem". In general, after upgrading GSM to V8.1, the Speedbase and Cobol Development software should also be upgraded.

- Attempts to print to a physical printer result in an irrecoverable ERROR Z.

This problem is caused by an insufficient number of PRINTER TRANSLATION TABLES. For GSM V8.0, and earlier, these translation tables were allocated from the pool of PRINTER BUFFERS. For GSM V8.1, the PRINTER TRANSLATION TABLES must be defined explicitly in the Nucleus Section of the Global Configuration file. Use either CFUPDATE or \$CUS/Configuration Maintenance/Printer Buffers to set the number of PRINTER TRANSLATION TABLES to be equal to the number of printers configured.

Important note: For all V8.0, and earlier, configuration files currently installed; and for all configuration files distributed with GSM V8.1, the number of Printer Translation Tables will be set to 1. The following zap (Z.81J00E) modifies the V8.0 default from 1 to 10 in the V8.1B Printer Executive and thus fixes the ERROR Z problem for all those sites with fewer than 11 printers:

```
ZZZZZZ
GVWYZN
GXPGDL
HGQGSM
GXNFTG
```


QJWLML
 VYZPKF
 QPWGGG
 WCDGWD
 XRQHGQ
 XXDZFH
 ZLWKXQ
 VMYPKT
 FVKHSS

- A PGM CHK 12 at 83C0 can sometimes occur when selecting a menu entry that invokes another menu file.

This problem is caused by a basic design feature of the menu handler and has NOT been fixed. The problem occurs when the "effective stack size" of a menu has been increased to a size larger than that of the item currently on the stack. The "work-around" solution is to ensure that all menu files on a system are of the same size. If the size of a menu file is increased, ensure that ALL users are signed off and run Menu Maintenance from the GSM READY: prompt.

- \$MAIL fails with STOP 8824 DATABASE FULL if the \$MAIL file is copied from the HAA diskette to the \$ML volume.

Do not attempt to install \$MAIL by copying the default \$MAIL file using \$F/COP. The GSM mailing system should only be installed during GSM installation or by using the System Maintenance option of \$CUS.

- Attempts to run \$BYE in partition 1 may fail with spurious PARTITION N IN USE messages when the "in use" partitions are displaying the main menu. This "problem" is a side-effect of a modification made to the menu handler for GSM V8.1.

The difference between GSM V8.1 and V8.0 is caused by the fixing of a bug in the V8.0 menu handler: Each menu contains two levels of "Allow log off" control. The "Allow logoff" flag in the Amend Menu Parameters function (i.e option 5 from the MN menu) is the primary log-off flag. The "Allow log off" flag in the Amend Menus function (i.e option 1 from the MN menu) is the secondary log-off flag. The secondary log-off flag is only tested if the primary flag is set to "Y".

The logic in the V8.0 menu handler was as follows:

```
IF primary-flag = "Y" THEN
  IF secondary-flag = "Y" THEN
    CALL LOGOF$          * ALLOW LOG OFF
  ENDIF
ELSE
*   Do nothing at all
ENDIF
```

For the V8.1 menu handler this code was changed to:

```
IF primary-flag = "Y" THEN
  IF secondary-flag = "Y" THEN
    CALL LOGOF$          * ALLOW LOG OFF
  ELSE
    * SECONDARY FLAG = N
    CALL NLOGOF$        * PREVENT LOG OFF!!!
  ENDIF
```

```

ELSE
* Do nothing at all
ENDIF

```

The V8.1 logic causes the menu to function in a way that agrees with the V8.0 & V8.1 documentation.

To summarise the behaviour:

Prim' flag	Sec' flag	V8.0	V8.1
Y	Y	Logoff allowed	Logoff allowed
Y	N	Unpredictable	Logoff disabled
N	Y	Unpredictable	Unpredictable
N	N	Unpredictable	Unpredictable

The code for V8.1 was changed to prevent the unpredictable behaviour (shown in emboldened text) that occurs with GSM V8.1. Under these conditions the "Allow log-off" status is dependent on the last program that was run from the menu, which was regarded as a definite bug.

APPENDIX A – NUMBERING SCHEMES FOR INTERNAL & EXTERNAL SOFTWARE

This appendix summarises the manifold version, revision and variant numbering schemes for the various software layers that comprise Global System Manager. Although the following numbering schemes may appear confusing at first sight, they are a natural result of the multifarious development environments that are used to produce these modules.

A.1 Global System Manager V8.1 external revisions and internal versions

Global System Manager V8.1 external revisions are numbered V8.1 followed by a lower-case letter (e.g. V8.1d, V8.1e, V8.1f etc.). Global System Manager V8.1 internal releases are numbered V8.1 followed by an upper-case letter (e.g. V8.1A, V8.1B etc.). There is no relationship between an external revision lower-case letter and an internal version upper-case letter. Internal version upper-case letters are normally reset to "A" immediately after an external release. To summarise:

External	Internal
V8.1a	V8.1A

A.2 Executive versions

Global System Manager executive versions are numbered V8.1 followed by an upper-case letter (e.g. V8.1A, V8.1B etc.). There is no concept of external and internal releases. However, there may be gaps in the sequence of version letters for a particular executive (the missing letters will refer to internal versions have not been released externally). In general, the versions of the executives within the +.J0 library are completely independent. To summarise:

External	Internal
V8.1A	Not applicable

A.3 Controller variants

Global System Manager controller variants for external release are numbered Vn.n (e.g. V4.2, V4.3, V4.4 etc.) or Vn.n followed by a lower-case letter (e.g. V4.4a). Internal release controller variants are numbered Vn.n followed by an upper-case letter (e.g. V4.3A, V4.3B etc.). In general, the variants of the controllers within the +.J5, +.JW and other controller libraries are completely independent. To summarise:

External	Internal
V4.4	V4.3A
V4.4a	V4.4A

A.4 GSM (MS-DOS) and GSM (Novell) BACNAT variants

Global System Manager BACNAT variants for external releases of the "workstation software" (e.g. GSMLOAD.EXE) are numbered Vn.n (e.g. V4.2, V4.3, V4.4 etc.). Internal release "workstation components" are numbered Vn.n followed by a lower-case letter (e.g. 4.3a, V4.3b etc.).

Global System Manager BACNAT variants for external releases of the Global System Manager "file-server software" (e.g. GSM.NLM) are numbered Vn.nn (e.g. V1.10, V1.11 etc.). Internal releases of the Global System Manager "file-server components" are numbered Vn.nn followed by a lower-case letter (e.g. V1.10a, V1.10b etc.).

Global System Manager BACNAT variants for external releases of the Speedbase "file-server software" (e.g. SPEEDBAS.NLM) are numbered Vn.nn (e.g. V1.00, V1.01 etc.). Internal releases of the Speedbase "file-server components" are numbered Vn.nn followed by a lower-case letter

(e.g. V1.00a, V1.00b etc.). To summarise:

External	Internal
V4.4	V4.3a
V1.11	V1.10e
V1.01	V1.00a

A.5GSM (Unix) BACNAT variants

Global System Manager (Unix) BACNAT variants are numbered Vn.nnn (e.g. V3.209, V3.210 etc.). There is no concept of external and internal releases. However, there may be gaps in the sequence of numbers for BACNAT variants that have not been released externally. To summarise:

External	Internal
V3.210	Not applicable

A.6GSM (Windows) BACNAT variants

Global System Manager (Windows) BACNAT variants for external release are numbered Vn.n, or Vn.n followed by an upper-case letter (e.g. V1.3, V1.4, V2.0, V2.9D etc.). Internal release Global System Manager (Windows) BACNAT variants are numbered Vn.n followed by a lower-case letter (e.g. V1.3a, V1.3b etc.). Because the Global System Manager (Windows) BACNAT software includes the "Global GUI Interface", the version of this interface is also relevant and is normally quoted (separated by a "/") after the BACNAT variant. To summarise:

External	Internal
V1.3/V2.1	V1.3a/V2.1f
V2.0/V2.1A	V2.0a/V2.2a

A.7Global Windows Workstation (GUI) versions

Although not strictly in the Global System Manager software hierarchy, the version of the Global Windows Workstation (GUI) is closely related to the version of Global System Manager and the the Global System Manager (Windows) BACNAT variant (see section A.6).

Global Windows Workstation (GUI) versions for external release are numbered Vn.n (e.g. V1.3, V1.4, V2.0 etc.) or Vn.n followed by an upper-case letter (e.g. V2.1A). Internal release Global Windows Workstation (GUI) versions are numbered Vn.n followed by a lower-case letter (e.g. V2.1a, V2.1b etc.). To summarise:

External	Internal
V2.1	V2.1a
V2.1A	V2.1k

APPENDIX B – UPGRADING GLOBAL SYSTEM MANAGER

This appendix summarises the facilities that are available to upgrade the various Global System Manager software layers. A full installation, using the technique described in the relevant Global Operating Manual, will always upgrade all the necessary software layers. However, it is possible to upgrade an installed Global System Manager using one, or more (depending on the actual software involved) of the upgrades described below. Note that if you have received a new BACRES volume you should normally apply BOTH the upgrades described in sections B.1 and B.2/B.3. If you have received a new BACNAT, in addition to a BACRES, the upgrade described in section B.4 should also be applied.

B.1 Upgrading Global System Manager and Speedbase PM

The "traditional" method of upgrading Global System Manager involves re-loading a single-user, Starter System from BACRES and re-installing from the BACRES, BEA, HAA, etc. diskettes. Although the Save/Restore current customisation option, introduced for GSM V8.1, has made the re-installation process less disruptive it still involves a considerable computer "down-time".

Global System Manager V8.1 can be upgraded from one revision to a later revision, without the need for a full installation. A new option in \$CUS (System Maintenance/Upgrade GSM revision), introduced with revision V8.1c, invokes a new overlay, \$CUSUPD. This overlay extracts the new components from a V8.1 BACRES, BEA, HAA, EPA volume set to upgrade the revision of an installed Global System Manager V8.1. This option allows an existing installation to upgrade the revision of GSM V8.1 WITHOUT THE NEED TO INSTALL GSM BY REBOOTING FROM THE BACRES DISKETTE.

\$CUSUPD first prompts for the BACRES diskette. The update file, \$UPDATE, is read from BACRES. Using the contents of \$UPDATE, the free space on the SYSRES volume is analysed. If \$CUSUPD detects there is insufficient space on the SYSRES volume, or if there is insufficient space in a command library (e.g. P.\$CMLB1) a list is displayed. You should switch to another partition and use \$F to enlarge the libraries and/or reorganise SYSRES. When \$CUSUPD determines there is enough free space on SYSRES, job dialogue is generated to copy the new components on BACRES, BEA, HAA and, optionally, EPA to SYSRES. Note the \$CUSUPD does not currently modify the Long Volume Description of the SYSRES volume, which will remain (mis-leadingly) set to the version of Global System Manager that was installed using a "traditional installation".

You are recommended to increase the sizes of the P.\$CMLB0 and P.\$CMLB1 libraries to allow 10% free space. This will reduce the amount of library reorganisation that will take place during the update and should reduce the time taken to complete the process. For example, to increase the size of P.\$CMLB0, use the following \$F dialogue:

```
GSM P1 READY:$F
$66 INPUT DEVICE:$DP
$66 OUTPUT DEVICE:<CR>
$66 FILE MAINTENANCE
:COP :P.$CMLB0 to:P.0 SIZE:%10 COPIED
$66 FILE MAINTENANCE
:REN :P.0 AS:P.$CMLB0
$66 FILE ALREADY EXISTS - DELETE?:Y RENAMED
$66 FILE MAINTENANCE
```

Do not be concerned by the large number of MOUNT prompts issued by

\$CUSUPD (you will be required to mount each diskette several times). This is necessary because the job is optimised to reduce the number of library opens.

IMPORTANT NOTE 1: \$CUSUPD can only be used to upgrade the revision level of GSM V8.1 (e.g. from revision V8.1b to V8.1d) - it cannot be used to upgrade to V8.1 from an earlier version (e.g. from V8.0 to V8.1). Note also that \$CUSUPD cannot be used to upgrade revisions of Global Configurator, Global File Converters, Global Cobol Development System or the Global Speedbase Development System. These products must be re-installed from the CFA, FCA, MKA and EDA diskettes, respectively.

IMPORTANT NOTE 2: \$CUSUPD can only be used to upgrade the revision level for a single configuration number. **IT CANNOT BE USED TO UPGRADE FROM ONE CONFIGURATION CODE TO ANOTHER.** The configuration code of the installed software on SYSRES must match the configuration code on the BACRES diskette. For example, \$CUSUPD cannot be used to upgrade from a Global System Manager (Novell NetWare) configuration 5611xx to 5613xx.

IMPORTANT NOTE 3: \$CUSUPD assumes that the various command libraries (e.g. P.\$CMLB0, P.\$CMLB1 etc.) have not been tampered with since the previous installation. **IF A SYSRES VOLUME CONTAINS A P.\$CMLBx COMMAND LIBRARY THAT HAS BEEN ALTERED IN ANY WAY, \$CUSUPD WILL FAIL UNPREDICTABLY, POSSIBLY RESULTING THE CORRUPTION OR DELETION OF ONE, OR MORE, OF THE COMMAND LIBRARIES.**

IMPORTANT NOTE 4: Before using \$CUSUPD it is absolutely vital that the following unit assignments are set up correctly:

\$IP Unit assignment of SYSIPL device or unassigned if no SYSIPL used;

\$BA Unit assignment of BACRES diskette.

Because of the slightly non-standard nature of the Global System Manager (Novell NetWare) installation, these unit assignments may not be established for Novell NetWare configurations. Use the \$CUS Permanent Unit Assignment customisation to establish the \$IP assignment to the workstation's SYSIPL unit (usually 297 or 110) and the \$BA assignment, which will usually be set to a40, to the 3.5" diskette drive on the workstation (usually 140).

IMPORTANT NOTE 5: The V8.1f \$CUSUPD allows Global System Manager V8.1 revision V8.1e, or earlier, to be upgraded to V8.1f. **IT IS NOT POSSIBLE TO UPGRADE TO REVISION GSM V8.1f WITH ANY VERSION OF \$CUSUPD OTHER THAN V8.1f. ANY ATTEMPT TO USE A VERSION OF \$CUSUPD EARLIER THAN V8.1f, WHEN ATTEMPTING TO UPGRADE TO V8.1f WILL RESULT IN THE FOLLOWING ERROR MESSAGE:**

INCOMPATIBLE VERSION OF GLOBAL SYSTEM MANAGER

Note that the unavoidable requirement for V8.1f \$CUSUPD is a result of some complex internal modifications to Global System Manager that have been implemented for V8.1f. To perform an update customisation to V8.1f use \$LIB to copy the \$CUSUPD file from the P.FULL2 library on the BEA volume into the P.\$CMLB1 library on SYSRES, deleting the existing \$CUSUPD member.

The above considerations for V8.1f also apply to V8.1g, and later. The following table describes the allowed upgrades and whether the "new"

\$CUSUPD must be copied from P.FULL2 on BEA to P.\$CMLB1 on SYSRES before to attempting the upgrade:

From/To	8.1c 8.1j	8.1d 8.1k	8.1e 8.1l	8.1f	8.1g	8.1h	8.1I
8.1b	Yes (8,10,11)	Yes	Yes	Yes	Yes	Yes (7)	Yes (8,9)
8.1c	Invalid Yes (8,10,11)	No	No	Yes	Yes	Yes (7)	Yes (8,9)
8.1d	Invalid Yes (8,10,11)	Invalid	No	Yes	Yes	Yes (7)	Yes (8,9)
8.1e	Invalid Yes (8,10,11)	Invalid	Invalid	Yes	Yes	Yes (7)	Yes (8,9)
8.1f	Invalid Yes (8,10,11)	Invalid	Invalid	Invalid	No	No	No (7,8) Yes (8,9)
8.1g	Invalid Yes (8,10,11)	Invalid	Invalid	Invalid	Invalid	No	No (7,8) Yes (8,9)
8.1h	Invalid Yes (8,10,11)	Invalid	Invalid	Invalid	Invalid	Invalid	No (7,8) Yes (8,9)
8.1i	Invalid Yes (8,10,11)	Invalid	Invalid	Invalid	Invalid	Invalid	No (7,8) Yes (8,9)
8.1j	Invalid Yes (8,10,11)	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid Yes (8,9)
8.1k (11)	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid Yes

IMPORTANT NOTE 6: The installation process for GSM V8.1 revision V8.1g GSM PM configurations introduced a problem that resulted in an internal flag being left in a state that incorrectly indicated a "non-PM" configuration. This innocuous problem is not immediately obvious when V8.1g GSM PM is running but will prevent the \$CUS/System Maintenance/Upgrade GSM revision (i.e. \$CUSUPD) from upgrading any new components from the V8.1h (or later) EPA diskette. This problem will also prevent the \$CUS/System Maintenance/Apply expiry date password option from functioning.

The problem only affects V8.1g GSM PM configurations. The problem does not occur when upgrading V8.1g non-PM configurations. The problem does not occur when upgrading V8.1f, or earlier, PM configurations.

To determine if the problem is present in a V8.1g GSM PM configuration run \$S. The first section of the top line should contain "GSM PM V8.1 Revision g". If the first section of the top line just contains "GSM V8.1 Revision g" (i.e. the "PM" is absent) do NOT attempt to use \$CUSUPD to upgrade to revision V8.1h (or later). To set the internal flag to the correct state (as displayed in the \$S report) run the program SETEP from the V8.1g or V8.1h (or later) EPA diskette and reload Global System Manager. The SETEP program will not display any dialogue but the result can be checked by running \$S (after reloading Global System Manager).

IMPORTANT NOTE 7: The first released version of V8.1i \$CUSUPD contained a bug that caused a PGM CHK 8 AT 279C. The problem is fixed by autozap BS8I04. The problem is also fixed in the V8.1j \$CUSUPD. If this zap has not been applied to the installed V8.1i it will be necessary to extract the V8.1j \$CUSUPD before upgraded from V8.1i to V8.1j.

IMPORTANT NOTE 8: Before upgrading an installed GSM system that includes a pre-V8.1j Global Cobol Development System to GSM V8.1j, or later, you **MUST** run \$LIB to remove the following extraneous library stubs (to SYSKIT) from the P.\$CMLB1 library on SYSRES:

```

$SCFCALC
$TRANS
$TRBACK
$TRMAIN

```

If these stubs are not removed from the P.\$CMLB1 library on SYSRES prior to upgrading, \$CUSUPD will fail. This additional step should not be required for run-time only systems that do not include the Global Cobol Development System.

IMPORTANT NOTE 9: The V8.1k \$CUSUPD allows Global System Manager V8.1 revision V8.1j, or earlier, to be upgraded to V8.1k. **IT IS NOT POSSIBLE TO UPGRADE TO REVISION GSM V8.1k WITH ANY VERSION OF \$CUSUPD OTHER THAN V8.1k. ANY ATTEMPT TO USE A VERSION OF \$CUSUPD EARLIER THAN V8.1k WILL FAIL.**

Note that the unavoidable requirement for V8.1k \$CUSUPD is a result of some complex internal modifications to Global System Manager that have been implemented for V8.1k. To perform an update customisation to V8.1k use \$LIB to copy the \$CUSUPD file from the P.FULL2 library on the BEA volume into the P.\$CMLB1 library on SYSRES, deleting the existing \$CUSUPD member.

Furthermore, the V8.1k \$CUSUPD utility and \$UPDATE control file were re-released to upgrade non-PM configurations correctly (see section 2.9.1 for further details). When using V8.1k \$CUSUPD to upgrade a non-PM GSM to V8.1k, in addition to being prompted to increase the sizes of P.\$CMLB0, P.\$CMLB1 and P.\$DEB you will be prompted to create the following libraries:

```

P.$SDLMO 490Kb
P.$CMLB2 260Kb

```

Just swap to another partition and use \$LIB to create 2 empty libraries of the required sizes. Finally, once the upgrade has completed, you will be required to assign the \$\$D logical assignment to the SYSRES unit;

IMPORTANT NOTE 10: The V8.11 \$CUSUPD allows Global System Manager V8.1 revision V8.1k, or earlier, to be upgraded to V8.11. **IT IS NOT POSSIBLE TO UPGRADE TO REVISION GSM V8.11 WITH ANY VERSION OF \$CUSUPD OTHER THAN V8.1k or V8.11. ANY ATTEMPT TO USE A VERSION OF \$CUSUPD EARLIER THAN V8.1k WILL FAIL.**

Note that the unavoidable requirement for V8.1k or V8.11 \$CUSUPD is a result of some complex internal modifications to Global System Manager that were implemented for V8.1k. To perform an update customisation to V8.11, from GSM V8.1j, or earlier, use \$LIB to copy the \$CUSUPD file from the P.FULL2 library on the BEA volume into the P.\$CMLB1 library on SYSRES, deleting the existing \$CUSUPD member. This procedure is not required when when upgrading from GSM V8.1k to V8.11.

Furthermore, when using V8.11 \$CUSUPD to upgrade a pre-V8.1k non-PM GSM to V8.11, in addition to being prompted to increase the sizes of P.\$CMLB0, P.\$CMLB1 and P.\$DEB you will be prompted to create the following libraries:

```

P.$SDLMO 490Kb
P.$CMLB2 260Kb

```


Just swap to another partition and use \$LIB to create 2 empty libraries of the required sizes. Finally, once the upgrade has completed, you will be required to assign the \$\$D logical assignment to the SYSRES unit.

PLEASE REFER TO APPENDIX H FOR FURTHER IMPORTANT INFORMATION REGARDING UPGRADES AND GSM V8.11.

IMPORTANT NOTE 11: Two serious problems have been discovered in the V8.11 \$CUSUPD utility. After using the V8.11 \$CUSUPD to upgrade from **any** previous version of GSM, or GSM-PM, the TAP library P.\$TAP must be renamed to P.\$TAPSO. After using the V8.11 \$CUSUPD to upgrade from **any** previous version of GSM-PM the library P.\$BAPGS must be copied from the EPA volume to SYSRES (over-writng the existing library).

B.2 Upgrading the Executives

For Global System Manager (BOS) configurations the Executives, distributed in the +.J0 library on the BACRES volume, are upgraded by either a full re-installation (see section B.1) or by using the Apply Nucleus Update option in the \$CUS System Maintenance menu (see section B.3). Alternatively, the executives can be upgraded using \$F or \$DIR to copy the +.J0 library from SYSRES (or SYSIPL).

For Global System Manager (MS-DOS and Windows) configurations the Executives, distributed in the +.J0 library on the BACRES volume, are upgraded by either a full re-installation (see section B.1) or by using the Apply Nucleus Update option in the \$CUS System Maintenance menu (see section B.3). Alternatively, the executives can be upgraded using \$F or \$DIR to copy the +.J0 library from SYSRES (or SYSIPL).

For Global System Manager (Novell NetWare) configurations the Executives, distributed in the +.J0 library on the BACRES volume, are upgraded by either a full re-installation (see section B.1) or by using the Apply Nucleus Update option in the \$CUS System Maintenance menu (see section B.3). **Important note:** See the comments in section B.3 that describe the short-comings in the \$CUS Apply Nucleus Update option when used on GSM (Novell NetWare) configurations

For Global System Manager (Unix) configurations the Executives library, +.C0, is empty.

For Global System Manager (Windows) configurations the Executives library, +.W0, is empty.

B.3 Upgrading the Controllers

For Global System Manager (BOS) configurations the controllers, distributed in the +.J5 and (optional) +.J5* libraries on the BACRES volume, are upgraded by either a full re-installation (see section B.1) or by using the Apply Nucleus Update option in the \$CUS System Maintenance menu (see section B.2). This customisation option uses the following algorithm:

```
Copy all %.* files (e.g. %.J5D) from BACRES to SYSRES
Copy all +.* files (e.g. +.J0 and +.J5) from BACRES to SYSRES
Copy all A.* files (e.g. A.J5) from BACRES to SYSRES
Copy all =.* files (e.g. =.5700) from BACRES to SYSRES
IF $IP (i.e. SYSIPL unit) is assigned THEN
  Move all +.* files (e.g. +.J0 and +.J5) from BACRES to SYSIPL
ENDIF
```

Alternatively, the executives can be upgraded using \$F or \$DIR to copy the +.J5* libraries from SYSRES (or SYSIPL).

For Global System Manager (MS-DOS and Windows) configurations the controllers, distributed in the +.JW and +.JW* (e.g. +.JWDOS) libraries on the BACRES volume, are upgraded by either a full re-installation (see section B.1) or by using the Apply Nucleus Update option in the \$CUS System Maintenance menu (see section B.2). This customisation option uses the following algorithm:

```
Copy all %.* files (e.g. %.JWD) from BACRES to SYSRES
Copy all +.* files (e.g. +.J0, +.JW and +.JWDOS) from BACRES to
SYSRES
Copy all A.* files (e.g. A.JW) from BACRES to SYSRES
Copy all =.* files (e.g. =.5620) from BACRES to SYSRES
IF $IP (i.e. SYSIPL unit) is assigned THEN
    Move all +.* files (e.g. +.J0, +.JW and +.JWDOS) from BACRES to
    SYSRES
ENDIF
```

Alternatively, the executives can be upgraded using \$F or \$DIR to copy the +.JW* libraries from SYSRES (or SYSIPL).

For Global System Manager (Novell NetWare) configurations the controllers, distributed in the +.JW and +.JW* (e.g. +.JWDOS) libraries on the BACRES volume, are upgraded by either a full re-installation (see section B.1); or by using \$F or \$DIR to copy the %.*, +.*, A.* and =.* files from BACRES to SYSRES, followed by the %.IPLJOB or =.NOVELL to recreate the SYSIPL volume(s). Remember to apply the upgrade to all SYSIPL volumes on the network.

Important Note: The Apply Nucleus Update option in the \$CUS System Maintenance menu does not currently handle the case of a typical GSM (Novell NetWare) installation where the controllers on the SYSIPL volume are held within a single +.JWIPL library. You are recommended to always upgrade by copying the various +.J0, +.JW and +.JW* libraries to SYSRES using \$F or \$DIR, followed by a rebuild of the SYSIPL volume(s) using =.NOVELL. **Important note:** Care should be taken to preserve any tailored configuration files over the SYSIPL rebuild.

For Global System Manager (Unix) configurations the controllers library, +.C2, is empty.

For Global System Manager (Windows) configurations the controllers library, +.W1, is empty.

B.4 Upgrading the BACNAT software

For Global System Manager (BOS) configurations, no BACNAT software is required.

For GSM (MS-DOS and Windows) configurations, the BACNAT software is upgraded trivially by copying the contents of the BACNAT diskette to the Global directory (see section 2.1.2 of the Global Operating Manual (MS-DOS and Windows)). Note that care may have to taken to prevent customised files, such as GSM.INI, from being overwritten.

For GSM (Novell NetWare) configurations, the BACNAT software is upgraded by copying the contents of the BACNAT diskette to the Global directory (see section 2.1.2.2 of the Global Operating Manual (Novell NetWare)). Several considerations must be remembered:

- Care must be taken to prevent customised files, such as GSM.INI, from being overwritten;
- The GSM NLM (GSM.NLM) and Speedbase Btrieve NLM (SPEEDBAS.NLM) must be unloaded before the upgrade is attempted;
- Any local, workstation Global directories, derived from the central Global directory on the NetWare server, should also be upgraded with the new BACNAT software to ensure consistency.

For GSM (Windows) configurations, the BACNAT software MUST be upgraded using the SETUP.EXE utility documented in section 2.9 of the Global Operating Manual (Windows). NEVER ATTEMPT TO UPGRADE THE GSM (WINDOWS NT) SOFTWARE BY COPYING FILES DIRECTLY.

For GSM (Unix) configurations, the BACNAT software MUST be upgraded using the glinstall utility documented in section 6.2.2 of the Global Operating Manual (Unix). NEVER ATTEMPT TO UPGRADE THE GSM (UNIX) SOFTWARE BY COPYING FILES DIRECTLY.

APPENDIX C – THE SPEEDBASE BTRIEVE OPTION FOR NOVELL NETWARE

This appendix describes the Speedbase Btrieve option for Novell NetWare in complete detail. Appendix D describes the Speedbase Btrieve option for Windows NT.

Important Note: Although the version of the Speedbase Btrieve NLM distributed on the BACNAT media is always the most recent **QC'ed** version, the latest **internal** revision of the Speedbase Btrieve NLM is always available, together with related documentation, on the Global web-site.

Important Note: Please refer to section D.13 for the details of a number of changes to the GSM (Novell) SPEEDBAS.NLM, and the related GSM (Windows) Gateways, released with GSM V8.11 (August/September 2000).

C.1 Hardware and Software Pre-Requisites

In order to use the Speedbase Btrieve option for Novell NetWare, the Novell file-server **MUST** be a 486DX, or better (although a Pentium-based computer is **STRONGLY RECOMMENDED**). The Speedbase Btrieve NLM (SPEEDBAS.NLM) checks that the processor is a 486DX, or later. If SPEEDBAS.NLM is run on a 80386 or 80486SX, it will report a warning and terminate.

The Novell file-server must be configured with sufficient memory to run the multiple NLM's required to access Btrieve files. Due to the extreme flexibility of file-server hardware configurations, no hard-and-fast rules regarding the minimum memory requirement are possible, 16Mb would appear to the **absolute** minimum.

The Speedbase Btrieve NLM has been tested on NetWare 3.12, 4.01, 4.02 4.10 and NetWare 5 (Dual processor).

The version of Btrieve installed on the Novell file-server **MUST** be V6.10, or later. **Important note:** A significant performance increase has been observed when using Btrieve V6.15 on the Novell file-server. Btrieve V6.15 must be obtained from Pervasive Software Inc. (formerly Btrieve Technologies Inc.), unlike Btrieve V6.10 (which is supplied with Novell NetWare). Pervasive SQL version 7 (aka Btrieve 7) and Pervasive SQL-2000 (aka Btrieve 7.5) are also supported – see sections C.12 and C.13 for further details. To summarise, the following versions of Btrieve are supported:

- Btrieve V6.10
- Btrieve V6.15
- Pervasive SQL (aka Btrieve version 7)
- Pervasive SQL-2000 (aka Btrieve version 7.5)

Any Speedbase application module that is to access a Btrieve format Speedbase database must be "Btrieve-aware". This is achieved by recompiling the application with the V8.1 Global Speedbase Development System. All versions of Global 3000 from V4.3 (i.e. V4.3, V4.4 and V4.5) are "Btrieve-aware". All future versions of Global 3000 are expected to be "Btrieve aware".

Important note: Developers should be aware that the Database Manager within the Speedbase Btrieve NLM is more stringent than the Global Speedbase Database Manager. Certain dubious, un-documented coding techniques that appear to "work" when used with Global format Speedbase databases may fail, or produce inconsistent results, when used with Btrieve format Speedbase databases. For example, index keys with

computational fields that contain strictly negative values should not be used.

C.2 Overview of the Speedbase Btrieve option for Novell NetWare implementation

The Speedbase Btrieve software is comprised of several modules within several software layers:

- Speedbase Presentation Manager has been enhanced to recognise and access Btrieve format Speedbase databases (this has resulted in changes to some software modules that comprise Speedbase Presentation Manager and the introduction of a new Memory Page in the P.\$BAPGS library);
- Several Speedbase utilities (e.g. \$BADGN, \$BAST) have been enhanced to recognise Btrieve format Speedbase databases. A new utility, \$BADN, has been introduced to create and maintain Btrieve format Speedbase databases (see section C.6, below);
- The following Speedbase Development subroutines have been enhanced to allow Speedbase applications to become "Btrieve aware" merely by recompiling:

```
B$OPN
B$CDB
B$CLD
B$STA
B$XCL
B$RBL
```

Important note 1: The version of B\$CDB released with GSM V8.1 revision V8.1d contains a bug which will result in an unexpected STOP 25402 when an attempt is made to close a database that has 2, or more, locks outstanding. This problem has been fixed in the V8.1f version of this subroutine. All developers who are producing "Btrieve-aware" applications are strongly advised to recompile using the V8.1f Global Speedbase Development System (but see Important Note 2);

Important note 2: The pre-V8.1i versions of B\$OPN and B\$XCL contained bugs that could result in a STOP 25404 (see section 2.7). **All developers who are producing "Btrieve-aware" applications are strongly advised to recompile using the V8.1i Global Speedbase Development System.**

- The Speedbase Btrieve NLM (SPEEDBAS.NLM) has been introduced. This NLM, like all Novell NetWare NLM's, runs on the Novell file-server. SPEEDBAS.NLM interfaces directly to the Btrieve engine (also running on the Novell file-server as an NLM);
- The SVC-61 interface for Global System Manager (Novell NetWare) configurations has been enhanced to allow Speedbase Presentation Manager, and the various Speedbase utilities, to interface with the Speedbase Btrieve NLM;
- The GSMLOAD.EXE module has also been enhanced to allow Speedbase Presentation Manager, and the various Speedbase utilities, to interface with the Speedbase Btrieve NLM (by the introduction of the new SPEEDBAS.OVL overlay with the Global System Manager (Novell NetWare) BACNAT software).

All these modules must be present in order for software (i.e. Speedbase utilities or applications) on a Novell NetWare workstation to access a Btrieve format Speedbase database on the file-server.

The changes to Speedbase Presentation Manager are "transparent" and are immediately available (i.e. no customisation is required) if the software version is GSM V8.1 revision V8.1f, or later. Speedbase Presentation Manager automatically detects the type of Speedbase database it is operating on.

The changes to the various Speedbase utilities are "transparent" and are immediately available (i.e. no customisation is required) if the software version is GSM V8.1 revision V8.1f, or later. The various Speedbase utilities automatically detect the type of Speedbase database they are operating on, although some utilities will only operate on a particular format of database (e.g. \$BADB will only function on C-ISAM format Speedbase databases; \$BADN (see section C.6, below) will only function on Btrieve format Speedbase databases).

The changes to the Speedbase subroutines are also transparent and are immediately available (i.e. no customisation is required) if the version of the Speedbase Development System is V8.1d, or later. The subroutines automatically detect the type of database they are operating on.

The Speedbase Btrieve NLM (SPEEDBAS.NLM) is fully described in section C.4, below.

The changes to the SVC-61 interface are "transparent" and are immediately available (i.e. no customisation is required) if the controller nucleus software variant is V4.4, or later.

The change to the GSM.INI file, which is recognised by the GSMLOAD.EXE module to enable Speedbase Btrieve (by loading the SPEEDBAS.OVL module) is described in section C.5, below. In addition to loading the Speedbase Btrieve NLM on the file-server (see section C.4) the only change to a standard Global System Manager (Novell NetWare) configuration involves a minor modification to the GSM.INI file. No other software changes are required (e.g. no configuration file changes are necessary) in order to allow Speedbase running on a workstation to become "Btrieve aware" so that Global format Speedbase databases can be converted to Btrieve format Speedbase databases; and to allow "Btrieve aware" applications to access Btrieve format Speedbase databases.

C.3 Configuring Btrieve on the Novell file-server

In order to access Btrieve format Speedbase databases from Global System Manager workstations the Speedbase Btrieve NLM **must** be running on a Novell file-server. The Speedbase Btrieve NLM, SPEEDBAS.NLM, supplements (it does NOT replace) the "traditional" Global System Manager NLM, GSM.NLM. On a standard configuration BOTH NLM's (in addition to several others, of course, including various NLM's for the Btrieve engine) must be running on a Novell file-server. However, it is possible to run the Speedbase Btrieve NLM on a separate Novell file-server from the Global System Manager NLM.

YOU ARE STRONGLY ADVISED TO RUN THE SPEEDBASE BTRIEVE NLM ON A SEPARATE NOVELL FILE-SERVER.

Before loading the Speedbase Btrieve NLM, ensure Btrieve is loaded on the file-server by using the BSTART command (this command can be

included in the AUTOEXEC.NCF file). **Important note:** The default Btrieve configuration parameters as supplied by Novell or Pervasive Software Inc. (formerly Btrieve Technologies Inc.) limit the number of open Btrieve files to 20. **THIS NUMBER IS INSUFFICIENT FOR MOST SPEEDBASE APPLICATIONS** and should be increased by using the BSETUP command. The "Number of Open Files" must be greater than the total number of records types in all the Btrieve format Speedbase databases that will be open at any one time on the Novell file-server (see Table C.1 for full details).

To use the BSETUP command, key the following on the Novell file-server console:

```
<prompt>:LOAD BSETUP
```

The following BSETUP parameters are typical:

```
Number of Open Files:           500
Number of Handles:             500
Number of Locks:               1000
Number of Transactions:        30
Largest Compressed Record Size: 0
*Largest Record Size:          8192
*Largest Page Size:            4096
&BSPXCOM Communication Buffer Size: 8192
Number of Remote sessions:     3
Cache Allocation:              2048
Perform Index Balancing:       No
*Create Files as Transactional: No
Logging of Selected Files:     No
Create Files in Pre V6.x format: No
Configure BSTART.NCF to Load Router: No
&BROUTER Communication Buffer Size: 8192
```

* = Btrieve V6.10x

& = Btrieve V6.15.2

Important note 1: If you use BSETUP while the Speedbase Btrieve NLM is in use, after running BSETUP you must run BSTOP, then BSTART, then load the Speedbase Btrieve NLM again (see below).

Important note 2: If BSTART has not been run before loading the Speedbase Btrieve NLM, the NLM will automatically load Btrieve but will use the default parameters which will almost certainly be insufficient for most Speedbase applications. ENSURE THAT BSTART HAS BEEN RUN BEFORE LOADING THE SPEEDBASE BTRIEVE NLM.

Important note 3: You are **STRONGLY** advised to use the BTRMON utility to monitor the usage of the various Btrieve resources (e.g. the number of Btrieve handles). For example, BTRMON will indicate immediately (by failing to report an open database) that Microsoft Access, for example, is not accessing a Btrieve database via the BTRIEVE.NLM but has exclusive, direct access to the database.

Important note 4: The Btrieve parameters required for, and configured by, other software products (e.g. ArcServe) may be insufficient for the Speedbase Btrieve NLM. For example, if ArcServe has configured Btrieve ensure that the number of Open Files, Handles and Locks is sufficient. Check also that the Cache Allocation is set to 2048 (by adding the -M=2048 option to the "LOAD BTRIEVE" command line).

Important note 5: The amount of disk caching available on the Novell server appears to be a crucial factor affecting the performance of Speedbase Btrieve. You are strongly advised to maximise the amount of cache buffers allocated on the server.

Important note 6: For Pervasive SQL (a.k.a. Btrieve 7) the BSETUP NLM/utility combination has been replaced by the SETUP utility (which is run on the workstation that Pervasive was installed from). When using this utility you must first connect to the server, then set the Parameters in the MicroKernel Database Engine.

Important note 7: For Pervasive SQL 2000 (a.k.a. Btrieve 7.5) the BSETUP NLM/utility combination has been replaced by the Configuration Manager in the Pervasive Control Centre. Most of the parameters described above can be set using the Configuration Manager. A more complete description will be available in a later version of these notes.

C.4 Loading the Speedbase Btrieve NLM (SPEEDBAS.NLM) on a Novell File-Server

To load the Speedbase Btrieve NLM from the Novell file-server system console key:

```
<prompt>:LOAD directory\SPEEDBAS
```

where directory is the absolute path-name of the Global System Manager home directory. If Global System Manager is not installed on the server that is running the Speedbase Btrieve NLM you can create a GSM home directory that only contains SPEEDBAS.NLM. Alternatively you can run SPEEDBAS.NLM from the SYSTEM directory, in which case the directory\ prefix can be omitted from the pathname specified in the LOAD command.

After a very brief introductory message, the Speedbase Btrieve NLM displays the main screen which consists of a title line containing the variant number of the NLM and a main menu with the following options:

- Diagnostics;
- Parameters;
- Status of Connections;
- Status of Speedbase locks;
- Unload Speedbase Btrieve NLM.

PLEASE QUOTE THE NLM VARIANT NUMBER IN ALL CORRESPONDENCE REGARDING THE NLM. FOR EXAMPLE, THE NLM VARIANT NUMBER MUST BE SUPPLIED WHEN REPORTING PROBLEMS WITH THE HOTLINE.

The SPEEDBAS.NLM screen uses a standard Novell Menu and List dialogue. See section 10.2.5.1 of the Global Operating Manual V8.1 (Novell NetWare) "Working with Lists" for an overview of this dialogue. If you wish the Speedbase Btrieve NLM to be loaded automatically when the file-server boots, edit the file-server AUTOEXEC.NCF file to include the above LOAD command (normally after a BSTART command).

Only a single copy of the Speedbase Btrieve NLM can be run on a particular Novell NetWare network. A future version of the Speedbase

Btrieve NLM may allow multiple copies of the NLM to be run on multiple file-servers (i.e. one per file-server).

C.4.1 Speedbase Btrieve NLM Diagnostics menu option

Important note: You should only select this option if advised to do so by the Global Service Centre. Enabling NLM diagnostics may slightly impair the performance of the Speedbase Btrieve NLM.

To select the Diagnostics sub-menu use the <UP-ARROW> or <DOWN-ARROW> keys to position the menu indicator over the "Diagnostics" entry on the main NLM menu and key <CR>. A menu with the following 3 options will be displayed:

- Debug screen;
- Debug file;
- Exit.

Note that any changes to these options are effective immediately.

Select the "Debug screen" entry to enable NLM diagnostics on the server screen. This will cause lines of diagnostic information to appear whenever the NLM is serving a request from a workstation. To close the debug screen, at any time, and return to the Diagnostic sub-menu, key "c" on the server console.

Enable the "Debug file" option to cause the NLM debug information to be written to a file "SPEEDBAS.LOG" in the current Global directory. The "Debug file" option is toggled on and off by using the <UP-ARROW> or <DOWN-ARROW> keys to position the menu indicator over the "Debug file" entry on the Debug sub-menu and keying <CR>. A NO/YES indicator shows the current status of the debug file option. When the flag is toggled from YES to NO the debug file is closed. Each open of the SPEEDBAS.LOG file creates a new empty file with information describing the server and a date/time stamp. Note that it is NOT possible to append new debug information to an existing file. The SPEEDBAS.LOG file is a simple text file and is readable by most MS-DOS editors. Select the "Exit" entry to return to the main NLM menu.

C.4.2 Speedbase Btrieve NLM Parameters menu option

To select the Parameters sub-menu use the <UP-ARROW> or <DOWN-ARROW> keys to position the menu indicator over the "Parameters" entry on the main NLM menu and key <CR>. A menu with the following 4 options will be displayed:

- TLI Deadman Timer (NetWare V4.x only);
- Fast Conversion Run;
- Enable TLI Spin Waiting;
- Enable ARCSERVE Backup;
- Exit.

Note that any changes to these options are effective immediately.

Select the "TLI Deadman Timer" entry to change the time period that the

server will wait before considering a workstation as "dead". This option is only available on NetWare V4.x servers. This option should only be changed if workstations are being disconnected unexpectedly (in which case you are recommended to increase the value from 2 to 4).

Enable the "Fast Conversion Run" option to increase the performance of \$BADN option 2 (Rebuild database) and option 4 (Convert database). When this customisation is enabled the Speedbase Btrieve NLM will process 10 records (instead of the default of 1) in a Rebuild or Conversion before sending a message back to the originating workstation (unless an error occurs). This option reduces the traffic on the network but may cause the Speedbase Btrieve NLM to swamp other tasks running on the same server.

The "Fast Conversion Run" option is toggled on and off by using the <UP-ARROW> or <DOWN-ARROW> keys to position the menu indicator over the "Fast Conversion Run" entry on the Parameters sub-menu and keying <CR>. A NO/YES indicator shows the current status of the "Fast Conversion Run" option. **Important note:** Remember to disable this mode when using the NLM in normal circumstances.

The "Enable TLI Spin Waiting" option can be used to modify the behaviour of the "Comms Threads" in the Speedbase Btrieve NLM. If "TLI Spin Waiting" is disabled, the apparent high CPU utilisation of Speedbase Threads 2, and higher (as displayed by the Scheduling Information option on the NetWare Console Monitor screen) will be minimal. The disadvantage in switching to "Non Spin-Waiting" mode (i.e. changing the value of this option from the default of YES to NO) is that if a user leaves their workstation logged in and has a database open, an attempt to Unload the Speedbase Btrieve NLM will probably result in hang. **This option should be used with extreme caution.**

The "Enable ARCSERVE Backup" option can be used to modify the behaviour of the "Main Thread" in the Speedbase Btrieve NLM. If "ARCSERVE Backup" is enabled, the main thread in SPEEDBAS.NLM will delay for 1/50 second during each main loop iteration (to provide ARCSERVE with extra CPU resource). This option should only be used if the performance of ARSERVE is being adversely affected by SPEEDBAS.NLM.

Select the "Exit" entry to return to the main NLM menu.

With the release of the V1.78 Speedbase NLM several new parameters have been added. Furthermore, some existing parameters, that control the CPU usage of the NLM, have been removed. The new parameters are described in section D.13.

C.4.3 Speedbase Btrieve NLM Status of Connections menu option

To select the Status of Connections sub-menu use the <UP-ARROW> or <DOWN-ARROW> keys to position the menu indicator over the "Status of Connections" entry on the main NLM menu and key <CR>. A scrollable list with an entry for each workstation that is currently connected to the Speedbase Btrieve NLM will be displayed. Use the <UP-ARROW>, <DOWN-ARROW>, <PAGE-UP> and <PAGE-DOWN> keys to move through the list. Key <ESC> to return to the main menu.

Important notes: The Status of Connections list is "read-only". For example, it is NOT possible to disconnect the selected workstation by keying <DELETE>. Furthermore, the Status of Connections list is not updated "on-the-fly" - if a workstation connects to (or disconnects from) the Speedbase Btrieve NLM while the list is displayed, it will not

appear until the "Status of Connections" option is re-selected from the main NLM menu.

Each entry in the Status of Connections list contains the following information:

```
Thread nn @ aaaaaaa nnnnnnnnnn xxxx [Node=hh] [with open D.B. [in
n Parts.]]
```

Where nn is a thread number within the executing NLM; aaaaaaa is the internetwork address of the workstation; nnnnnnnnnn is the node address of the workstation; xxxx is the Socket Number. Furthermore, the Global System Manager Node-id is displayed as a hexadecimal number (if this value is known) and an indication given if the workstation has any Btrieve format Speedbase databases open. If more than 1 partition on an NLM thread (i.e. on a workstation) has a database open then the number of partitions is also listed.

If no workstations are connected to the Speedbase Btrieve NLM, the Status of Connections list will just contains the following entry:

There are no active connections

C.4.4 Status of Speedbase Locks Screen [NEW SECTION TO BE ADDED HERE]

C.4.5 Speedbase Btrieve NLM Unload menu option

To unload the Speedbase Btrieve NLM use the <UP-ARROW> or <DOWN-ARROW> keys to position the menu indicator over the "Unload Speedbase Btrieve NLM" entry on the main NLM menu and key <CR>. If no workstations are currently connected to the Speedbase Btrieve NLM, the NLM will shut-down cleanly.

If you attempt to exit from the Speedbase Btrieve NLM while workstations are connected the Status of Connections list will be displayed (see section C.4.3) with the following warning message displayed as the first two entries in the list:

```
WARNING: The Threads in this list are active, key <CR> to continue.
If you want to unload the Speedbase NLM despite active threads, key
Delete!
```

Move the menu indicator to the second line and key <DELETE> to exit the Speedbase Btrieve NLM while one, or more, workstations are connected to the NLM. **Important warning:** Exiting the Speedbase Btrieve NLM while workstations are connected may cause unpredictable results including database corruption. You should only exit the Speedbase Btrieve NLM while one, or more, connections are active if it is not possible to run \$BYE on the active workstation(s). For example, if a workstation has crashed while connected to the Speedbase Btrieve NLM and has not been disconnected by the TLI Deadman Timer.

Key <ESCAPE> to return to the main NLM menu.

C.5 Loading Btrieve-aware Global System Manager PM on a Novell Workstation

To enable the Speedbase Btrieve workstation option, the following keywords must be defined in the GSM.INI file when running GSMLOAD.EXE:

```
SPEEDBASE xx BUFFER yyyy
```

where xx is the Maximum Number of Servers and yyyy is the Maximum Buffer Size (e.g. 4088). The Maximum Number of Servers MUST BE SET TO 1 (although a future version of SPEEDBAS.NLM will allow this value to be equal to, or higher than, the number of Novell file servers that are running the SPEEDBAS.NLM in multiple server configurations when this option is implemented - see section C.4). The Maximum Buffer Size must be equal to, or higher than, the largest record size in the Btrieve format Btrieve databases.

Important note: The GSM.INI Speedbase Btrieve "SPEEDBASE" option and Btrieve UCI "UCI" option (described in section 4.3.2) are mutually exclusive;

If the Speedbase Btrieve NLM is not running on a server on the network, the following fatal error message will be displayed:

No Speedbase Btrieve NLM Found on Network

To avoid this error from occurring, either load the Speedbase Btrieve NLM on a suitable server (see section C.4), or remove the "SPEEDBASE" entry in the GSM.INI file (to load a Btrieve "unaware" Global System Manager PM), before running GSMLOAD.EXE again.

If the Speedbase Btrieve workstation option is enabled on a workstation that is running Global System Manager (Novell NetWare) an entry for that workstation should appear in the Status of Connection list displayed on the screen displayed by the Speedbase Btrieve NLM (see section C.4.3, above).

C.6 The \$BADN utility

Global System Manager V8.1 revision V8.1f, and later, include the Speedbase Presentation Manager \$BADN utility. In addition, several existing utilities, \$BADGN, \$BAST and \$BASTS) have been made "Btrieve aware". Note that the Database Rebuild Utility (\$BARBL) will NOT function with Btrieve format Btrieve Databases (option 2 of \$BADN, see below, should be used instead of \$BARBL).

C.6.1 Introduction

The Speedbase Btrieve Database Management Utility, \$BADN, is used to perform the following operations:

- creation of Btrieve format Speedbase databases;
- rebuilding the indexes of Btrieve format Speedbase databases;
- transferring data from a "traditional" Global format Speedbase database to a Btrieve format Speedbase database;
- conversion of a Btrieve format Speedbase database to a new Dictionary;
- deletion of unwanted Btrieve format Speedbase databases;
- changing the Novell path to a Btrieve format Speedbase database.

A Btrieve format Speedbase database consists of a data dictionary file and a schema file, both stored as Global format files, and in addition, a special Btrieve Database control file (BDCF) and several Btrieve files which contain both data and indexes stored on the Novell file-server.

The names of the files are described below, where xxxxx is the database name and rt1 to rtn are up to thirty-six record types (see Table C.1).

The data dictionary is created by the application developer using the Speedbase Development System dictionary utility. The five character database name xxxxx is specified when the database is created using the Speedbase Btrieve database management utility (see section C.6.2). The Btrieve data-files, which each store the data of a specific record type, are adjusted in size automatically. There is no need to re-allocate the data-files to provide additional space, as is occasionally required for "traditional" Global format Speedbase databases.

The Speedbase Btrieve database utility may be run directly, by keying \$BADN to the main menu or GSM READY: prompt. The following menu will appear:

Btrieve Database Management Utility

1. Create New Btrieve Database
2. Rebuild Btrieve Database
3. Load Btrieve Database
4. Convert Btrieve Database
5. Delete Btrieve Database
6. Change Novell Path to Database
7. Exit

The first six menu options are described in the following sections.

Note that \$BADN may display several obscure baseline messages that include phrases such as "TQRES error". These messages are included for diagnostic purposes only (but should be reported in full if a problem is encountered).

File id	Description	Global
Dixxxxx	Data Dictionary	Global
DBxxxxx	Schema File	MS-DOS flat file
Dxxxxx	Btrieve Database Control File (BDCF)	Btrieve
(Dxxxxxrtn.DAT)	Btrieve Datafile for Speedbase Record Type rtn, where rtn is the 2 character Record Type	Btrieve
(FILE.DDF)	Data Definition File (see below)	Btrieve
(FIELD.DDF)	Data Definition File (see below)	Btrieve
(INDEX.DDF)	Data Definition File (see below)	Btrieve
(FIELDEXT.DDF)	Data Definition File (see below)	Btrieve
(COMMENT.DDF)	Data Definition File (see below)	Btrieve

Table C.1 - Speedbase Btrieve Database Files

Note-1 The Data Definition Files (DDFs) are only required for external access to the Btrieve format Speedbase database.

Note-2 If xxxxx is shorter than 5 characters, the trailing spaces in the Btrieve filenames, Dxxxxx, will be replaced by underscores (e.g. DCL___AN.DAT).

Note-3 New DDF files are created if none exist in the Novell directory. If a DDF file exists, new entries are added to the file, or existing entries are replaced in the file.

C.6.2 Create Btrieve Format Speedbase Database

To create a new Btrieve format Speedbase database, select option 1 from the main \$BADN menu.

Enter the dictionary name and its unit number. The utility displays the generation number, creation date and title of the dictionary. You should now enter the five-character database name and the unit on which you wish to store the Global format schema file and new Global format dictionary file. **Important note:** The restriction of 5 character names that is present in the implementation of C-ISAM format Speedbase databases IS NOT a restriction in the implementation of Btrieve format Speedbase databases. The underscore character is used to replace any trailing spaces in the Btrieve file names.

Two warnings may be displayed at this point in the dialogue. If a database of the same name already exists on the specified unit, a warning pop-up will alert you to this fact. The pop-up will ask you to confirm that you want to delete this pre-existing database before proceeding. If you confirm this prompt then the database will be deleted in its entirety (including all associated Btrieve files).

If a dictionary of the same name exists on the specified unit, then a pop-up will again alert you to this. You will be asked to confirm deletion of the dictionary before proceeding.

You then enter the name of the Novell file-server that is running the Speedbase Btrieve NLM.

Finally, specify the name of the Novell directory path, on the file-server, for the Btrieve database data-files (e.g. SYS:\GSM\BTRFILES). The current working directory is shown, and you may specify the required directory path relative to this.

YOU ARE STRONGLY ADVISED TO ALLOCATE A UNIQUE NOVELL DIRECTORY FOR EVERY BTRIEVE FORMAT SPEEDBASE DATABASE THAT YOU CREATE.

The utility then checks the Novell directory to ensure that there are no files that would be overwritten by the creation of the database. If files are detected, the following prompt will appear:

Database already exists on this directory - Delete?

If you reply Y any Btrieve files pointed to by the BDCF file being deleted will also be deleted.

C.6.3 Rebuild Btrieve Format Speedbase Database

The Speedbase Btrieve database utility rebuild option is used to re-establish all linkages within the database. A rebuild should not be necessary unless data corruption, caused by a hardware or software failure, has occurred on the server.

The Btrieve rebuild process is the equivalent of a Total Rebuild in \$BARBL or \$BADB.

A database rebuild is used as a recovery procedure following either hardware or software failure. A rebuild guarantees the integrity of the information stored on the database by reconstructing the linkages that connect related records. For example, the total rebuild of a database containing customer and invoice records would firstly recreate all indexes to both of these record types. Each invoice record would then be checked to ensure its linkage with the correct customer record.

A rebuild will also recalculate accumulators as part of this process. In the above example, the customer account balance would be recalculated to ensure that it is equal to the value of all related invoices.

This process goes beyond a simple checking. For example, it also recalculates GVA's from GVF's.

The type of errors discussed above can only arise from certain hardware malfunctions (e.g. a power loss) or from extremely serious program errors. The utility guarantees the internal integrity of the database following such errors, but some application programs may require further processing to be performed.

Important note: These errors can also be caused by malicious/accidental manipulation of the Database with external packages such as Microsoft Access. For example, if a Speedbase Master record was deleted using Access then the Speedbase Database Manager would be unable to maintain its Master/Servant relationships.

The rebuild option operates by examining the data records physically stored in the database files. This means that all information up to and including the last successfully completed database update can normally be rebuilt. The option cannot be used, however, if the disk on which the database resides is lost or develops permanent errors. In this event the only recourse is to resort to a backup copy of the database.

During normal use, Speedbase Presentation Manager checks the internal integrity of the database, and will notify you if any inconsistencies are found. If this occurs, a rebuild should be performed. To rebuild a Btrieve format Speedbase database select option 2 from the main \$BADN menu. Specify the name and unit of the schema file.

Reply to the Continue with rebuild prompt as required. The Speedbase Btrieve database utility displays each record number as the rebuild proceeds.

C.6.4 Load Btrieve Format Speedbase Database

A "traditional" Global format Speedbase database may be loaded into a Btrieve format Speedbase database. To load a newly created Btrieve format Speedbase database with data from a Global format Speedbase database, select option 3 from the main \$BADN menu.

Specify the name and unit of the Global format Speedbase database. The "target Btrieve database" window will be displayed.

Reply with the name and unit of the schema file you specified in the database creation phase (see section C.6.2) and confirm that the transfer is to proceed. The Speedbase Btrieve database utility displays

the transfer details pop-up as records are transferred from the Global format Speedbase database to the new Btrieve format Speedbase database.

Important note: You may only transfer data to a newly-created Btrieve format Speedbase database. You cannot use this function to transfer data to a database containing any data records. If you wish to re-transfer data you should create the Btrieve format Speedbase database afresh, deleting the previous version, and transfer data from the Global format Speedbase database to it. **Any data present in the Btrieve format Speedbase database but not present in the Global format Speedbase database would be lost in this process.**

C.6.5 Convert Btrieve Format Speedbase Database

This option is used to convert a Btrieve format database to a new generation database. Thus, it is the equivalent of using \$BADGN with a Conversion Dictionary. To convert a database, select option 4 from the main \$BADN menu.

Enter the database name and unit of the database schema file. \$BADN displays the generation number, creation date and title of the database.

Confirm that the selected database is the one that you want to convert then supply the destination database name and unit of the schema file (this may be same or different to the source database).

You will then be prompted for the current Novell Server and Pathname. Either confirm with a <CR> or edit the pathname of the new database. **Important note:** You cannot change the Server Name - the conversion is performed by the Speedbase Btrieve NLM on the server that contains the source database.

You will then be prompted if you want to convert to a new version. If you are supplying a new conversion dictionary, key Y to this prompt; otherwise key <CR> (to accept the default of N) and the conversion option will perform a database copy at the record level (i.e. performing the equivalent of a database Rebuild while copying).

If you respond Y to choose to convert to a new version, you will be prompted for the name and unit of the conversion dictionary.

A pop-up window will appear to indicate the progress of the conversion.

C.6.6 Delete Btrieve Format Speedbase Database

This option allows you to delete either a Btrieve format or Global format Speedbase database. To delete a database, select option 5 from the main \$BADN menu.

Enter the database name and unit of the database schema. The utility displays the generation number creation date and title of the database.

To delete the database respond "Y" to the confirmation prompt. The utility will then delete all Global format and Btrieve files associated with the database.

On completion the utility returns to the main \$BADN menu.

C.6.7 Change Novell Path

This option allows you to change the Server and Path names stored in the schema file to point to the Database. This option makes it extremely easy to move Speedbase format Btrieve databases from one Novell file-

server to another. For example, after using a tape backup/restore procedure to effect a data transfer.

C.6.7.1 Notes on Moving Btrieve format Speedbase Databases

As explained above, a Btrieve format Speedbase database consists of 5 parts:

- A Global format Data Dictionary (e.g. DIDEMON);
- A Global format Schema File (e.g. DBDEMON) on the same unit. Note that the Schema File for a Btrieve format Speedbase database is unlike the Index File, with the same name, for a Global format Speedbase database. The Speedbase Btrieve Schema File contains pointers to the BDCF and Btrieve data files. These pointers contain the Server name and the path to the BDCF file;
- The BDCF file. This is very similar to the Global Data Dictionary file but resides on the Server in the same directory as the Btrieve data files;
- The Btrieve data files, one per Speedbase record type. Each file contains the data and indexes;
- Various entries in FILE.DDF, FIELD.DDF and INDEX.DDF files. These are held in the same directory as the BDCF & Btrieve data files. These files provide external products, such as Pervasive Scaleable SQL, a view of the database.

Before using the “Change Path to Database” option of \$BADN you must:

- Move the Data Dictionary (e.g. DIDEMON) and Schema File (e.g. DBDEMON), if required, to a new Global unit and/or server;
- Use a Windows or Novell utility to move the BDCF file (e.g. DDDEMON) and the Btrieve data files (e.g. DDEMONTR.DAT etc.) to the new directory and/or server;
- If no DDF files exist in the new directory move them (INDEX.DDF, FILE.DDF, FIELD.DDF, FIELDEXT.DDF, COMMENT.DDF). **Important note:** If DDF files do exist in the new directory and they contain valid entries then this procedure is not recommended (use one of the techniques described below). If external access to the database is not required, the DDF files can be ignored;
- Use the \$BADN option 6 “Change Path to Database”. When entering the “Rename Database Details” specify the Schema File name and the Global unit containing the Schema File (if the Schema File has been moved, specify the new unit). Enter the new Server name (if appropriate), the default will be the old Server name. If the Server has not changed, accept the default reply. Finally, enter the full pathname to the BDCF file. Note that you will be prompted with the old pathname, which can be edited as required. Once the “Change Path to Database” option has completed, the Btrieve database in the new position should now be useable.

IMPORTANT NOTE: When copying a Btrieve format Speedbase database it is **ABSOLUTELY VITAL** that certain crucial Gateway options, established on the server from which the database was taken, are duplicated on the server to which the database is being copied. At the time of writing

the only crucial registry setting that must be preserved during a database transfer is:

PervasiveTrueNullDate

The technique described above preserves the "True Null Date" option within the database. This information will be written to the Speedbase Gateway log file when the database is opened so that a simple \$BAST "get status" function will allow the "True Null Date" option from the original server to be determined.

Thus, the above procedure should be followed by:

- Enable the Speedbase log-file option "DiagnosticLogFile" and use \$BAST to access the database;
- Examine the log-file and check the "True Null Date" setting. If the True Null Date setting is enabled the log-file will contain the message:

Opening Btrieve Database with 5 byte data

If the True Null Date setting is disabled the log-file will contain the message:

Opening Btrieve Database with 4 byte data

- Ensure the "PervasiveTrueNullDate" setting in the registry agrees with the date field option that was in force when the original database was created;
- Reload the Speedbase Gateway.

There are two alternatives to using the \$BADN "Change Path to Database" option. The first technique is useful for small databases. However, this technique can only be used if the new pathname is on the same server. Use the \$BADN "Convert Btrieve Database" option, providing the usual inputs. Edit the new path to the BDCF file. Key "N" to the "Do you want to convert to a new version" prompt to indicate that there is no conversion dictionary. Note that this technique moves the database, rather than copying it, and performs a rebuild at the same time. This technique is useful for small databases but may take a long time to complete for large databases

For the second alternative to using the \$BADN "Change Path to Database" option following this procedure. This technique **MUST** be used when copying a database(s) into a destination directory that already contains other Btrieve databases (i.e. copying the .DDF files from the "source server" is not an option):

- Move the Data Dictionary (e.g. DIDEMON) to the new Global unit and/or server;
- Use the \$BADN "Create new database" option to create a new empty database in the new Novell/NT directory. This will create:
 - The Global format Schema File (e.g. DBDEMON);
 - The correct DDF files required for external access;

- A set of empty Btrieve files (e.g. Dxxxxnn.dat);
- Use a Windows or Novell utility to copy all the Btrieve files (Dxxxxnn.dat) over the empty databases. **DO NOT COPY THE BDCF FILE OR THE DDF FILES.**

IMPORTANT NOTE 1: When using this short-cut technique (i.e. just copying the data files) it is **ABSOLUTELY VITAL** that the "PervasiveTrueNullDate" option that is established on the server from which the database was taken, is duplicated on the server to which the database is being copied. **THE CORRECT "PervasiveTrueNullDate" OPTION MUST ESTABLISHED BEFORE THE NEW, EMPTY DATABASE IS CREATED.**

IMPORTANT NOTE 2: When using this short-cut technique (i.e. just copying the data files) if the original database was created on a version of the Speedbase Btrieve Gateway or NLM prior to V1.75c it is **ABSOLUTELY VITAL** that the database be rebuilt prior to use. This rebuild must be performed (either before or after the copy) using a version of the Gateway or NLM that is V1.75c, or later. This need for a rebuild is due to a bug that was fixed by V1.75c that affected the Uplink field values in all Btrieve format Speedbase databases.

C.7\$BADN User Notes

This section contains some miscellaneous points that should be considered when using \$BADN to create or load Btrieve format Speedbase databases.

C.7.1 Database Names do not have to be 5 Characters

Unlike the restriction on the Speedbase C-ISAM \$BADB utility, the Speedbase Btrieve \$BADN utility does not restrict the name of the database to exactly 5 characters.

C.7.2 Dictionary Copied

The Data Dictionary is automatically copied to the same unit as the Global format schema file when \$BADN is used to create a new database.

C.7.3 Converting a Btrieve format Speedbase Database to Global

The Speedbase Presentation Manager \$BADGN utility can be used to generate a Global format Speedbase database from a Btrieve format Speedbase database.

C.8Btrieve Format Speedbase Databases - Special Considerations

This section contains some miscellaneous points that should be considered when using 3rd party utilities to access the Btrieve files that constitute a Btrieve format Speedbase database.

Users must be **EXTREMELY** careful using external packages, such as Microsoft Access, to update Btrieve format Speedbase databases. The following guidelines **MUST** be followed:

- Firstly, you must ensure that the external package is using the Btrieve NLM to read the Btrieve files otherwise Speedbase locks will not function correctly. This is achieved with Access by loading the MS-DOS BREQUEST program before loading Windows. **Important note:** Microsoft Access will still appear to work if BREQUEST is not loaded but will do so by accessing the Btrieve files directly (i.e. without using the Btrieve NLM).

- EXTREME caution must be used when adding or deleting records to not destroy any Master/Servant relationships. This includes SGC Counts.
- EXTREME caution must be exercised when updating records in a Btrieve format Speedbase database to not update any Status, link, GVA or GVF fields or any Index fields, where that index forms part of the Master Relationship.

C.90 Open Database format

The Btrieve files produced and accessed by Speedbase Btrieve are truly "open" and can be accessed by any other 3rd party software that supports the Btrieve file format (e.g. Microsoft Access etc.).

The "open" access is provided by a set of DDF's (Data Definition Files). These files are required because Btrieve itself is purely a Record Manager and knows nothing about the internal structure of the records, except for Index fields. A set of DDF's is created in each directory that Btrieve format Speedbase databases are placed in. Note that all the Btrieve files for a particular Btrieve format Speedbase database are held in the same NetWare directory. The DDF files are themselves Btrieve files.

The FILE.DDF file points to the different Btrieve files in the directory.

The INDEX.DDF file describes all the segments of all the indexes for all the files listed in FILE.DDF.

The FIELD.DDF file describes all the data fields for the all the files listed in FILE.DDF.

The FIELDEXT.DDF and COMMENT.DDF files are not strictly necessary but are provided for compatibility with Smithware's DDF Builder.

If DDF files are present in the directory that a Btrieve format Speedbase database is being created in then the appropriate entries are automatically added to the DDF files. If no DDF files exist when the Btrieve format Speedbase database is created then DDF files are created that are similar to those created by Smithware's DDF Builder. **Important note:** Not all DDF utilities are fully compatible. We have tried to maintain compatibility with Smithware's DDF Builder V2.0 and V2.5.

C.9.1 Interfacing with Microsoft Access

As an example of interfacing between a Btrieve format Speedbase database and a 3rd party "open" product, we will use Microsoft Access. Access acts as a front end for your Btrieve data files via the ODBC (Open Database Conectivity) standard.

Microsoft Access, when installed with the Btrieve ISAM data source option, has the ability to Import or Attach Tables of data. Importing data fetches information into a Microsoft Access database from an external source (e.g. a text file). Attaching data means that the data is recognised as part of the Access data but is stored in an "open" database format (e.g. in a Btrieve database).

To allow Microsoft Access to work with files on a Novell NetWare server using the Btrieve Client/Server engine you will need BTRIEVE.NLM loaded on the server along with BREQUEST.EXE loaded, before Microsoft Windows, on the Workstation. You will also need WBTRCALL.DLL (size 16Kb) and WBTRVRES.DLL (of appropriate size and date) installed on the workstation

(see section C.9.2).

Finally, you must modify WIN.INI according to the Microsoft file ACREADME.HLP. This file is located in the Microsoft Access subdirectory and is read with the Microsoft Windows Help engine. Microsoft Access checks WIN.INI for a [Btrieve] section for an Options line which must meet the following criteria:

/f set to 20

/l set at least double /f

/m set >48

/n set >0

/p set to 4096

/t set to point to a valid subdirectory, but not necessarily a valid file in it.

Note that Btrieve V6.10 does not use the information specified in WIN.INI, but Microsoft Access requires it to be established.

After installing the appropriate files, ensuring the .DDF files are available and Microsoft Access has been correctly configured you can use the following procedure to attach a Btrieve data file:

- 1). Open the required Microsoft Access database;
- 2). From the Microsoft Access "File" menu select the ATTACH table option;
- 3). A list of Data Resource Types is displayed. Select the "Btrieve" option from this list. If Btrieve is not on the list you may need to re-install Access;
- 4). You will then be prompted for a filename, the default is FILE.DDF. The directory is the one described in section C.6.2;
- 5). Having selected FILE.DDF, a list of all available tables is displayed. These tables are the ones described in section C.6.2. One, or more, of these tables can be selected. Once selected, the fields in the table can be used within the Access database as normal.

Important Note: As standard, Btrieve ISAM is not available with Microsoft Access for Windows 95 version 7.0. However, Pervasive Software Inc. (formerly Btrieve Technologies) do provide a 32-bit ODBC driver. This driver has not been tested by Global Business Systems. For further details please refer to www.microsoft.com and www.btrieve.com.

C.9.2 Some tips for using Access with Speedbase concurrently

The use of Speedbase Btrieve from a workstation, using GSMLOAD.EXE (see section C.5) does not require any Btrieve software to be installed on that workstation. However, you must activate/install the MS-DOS BREQUEST.EXE file, normally in your workstation AUTOEXEC.BAT file, if you want to use Microsoft Access at the same time as Speedbase. If you do not install BREQUEST.EXE, Access will not use the Btrieve NLM to

access the Btrieve database and locked records will result in I/O errors etc. **IT IS VERY LIKELY THAT ANY RECORD UPDATES WILL RESULT IN DATABASE CORRUPTION IF THE SPEEDBASE BTRIEVE NLM ACCESSES THE DATABASE AT THE SAME TIME!**

The version of BREQUEST.EXE must be at the same level, or higher, than the version of the Btrieve NLM.

The Windows Btrieve client software must be installed correctly. This is done automatically if a product such as Smithware DDF Builder is installed. NOTE THAT INSTALLING MICROSOFT ACCESS DOES NOT INSTALL THE WINDOWS BTRIEVE CLIENT ENGINE.

Do NOT set up Access with the VIEW/OPTIONS/MULTIUSER-ODBC/RECORD LOCKING set to "EDITED RECORD". IF you do and then try to edit a record that the Speedbase Btrieve NLM has locked, Access will hang the workstation!

The normal Access locking option is "NO LOCKS". With this option enabled, if you attempt to edit a locked record and the user that has the record locked doesn't relinquish control, the only exit route out of Access is to close the file.

C.10 New STOP and EXIT codes

The following new STOP and EXIT codes may be produced by the Btrieve specific components of Speedbase PM:

STOP 25401	B\$OPN	SVC-61 handler is missing or pre-V4.3 +JWNS61
STOP 25402	B\$OPN	Comms failure to Btrieve NLM (also B\$CDB, B\$XCL, B4\$DBX)
STOP 25403	B\$CDB	Database Close failure (also B\$XCL, B4\$DBX)
STOP 25404	B\$XCL	Btrieve unspecified error
STOP 25405	misc.	Illegal operation for Btrieve (this is an internal error)
STOP 25406	B\$OPN	Schema file DBID/DGEN differs from Btrieve file
STOP 25407	B\$XCL	Cannot re-open database shared
STOP 25408	B5\$DBXA	write has been attempted and a master is not in memory or is locked
STOP 25409	B5\$DBXA	rewrite has been attempted and a master is not in memory or is locked
EXIT 25564	B\$OPN	Cannot Attach to DOS shell
EXIT 25565	B\$OPN	Cannot logon to Speedbase Btrieve NLM
EXIT 25566	B\$OPN	Cannot open BDCF file on server
EXIT 25567	B\$OPN	Too many databases open or insufficient server memory
EXIT 25568	B\$OPN	Unspecified error from Btrieve open

EXIT 25569 B\$OPN Btrieve/Bsetup Number of Open Files or
Handles is too small

C.11 Speedbase Btrieve NLM Error Codes

The following error codes may be generated by the Speedbase Btrieve NLM (and will appear in the SPEEDBAS.LOG log file or on the diagnostic screen if a debug option has been enabled - see section C.4.1). Note that this list has been updated to include errors generated by the Speedbase Btrieve Gateway (see Appendix D) and the Speedbase SQL Server Gateway (see Appendix E):

Code Meaning

- 1 - 199 Btrieve error. Please consult your Btrieve manual for further details
- 200 Logical error in the Speedbase Btrieve NLM
- 201 User has not logged on before another Task
- 202 User has issued a reserved Task opcode
- 203 User has issued a TQOPCD < 0 or > 14
- 204 More users than MAXTASKS have attempted to logon
- 205 Cannot open BDCF file
- 206 I/O error on the BDCF file
- 207 A task has attempted to open a database more than MAXOPENS times
- 208 Too many databases open
- 209 Path length exceeds MAXPATH
- 210 Trying to access/close a database that the Task has not opened
- 211 Trying to logoff a task that has not logged in
- 212 User has provided a task-id > MAXTASKS_IN_USE or <= 0
- 213 User has provided a database-id > MAXDBS or <= 0
- 214 User has provided a task-id without matching RANDOM check
- 215 An attempt has been made to create a Btrieve file with more than MAXSEGS Index segments
- 216 An attempt to create an Index with < 1 or > 16 segments
- 217 Not enough memory to read BDCF file
- 218 BDCF file size does not match size in header
- 219 User has supplied a record-id that is not on the file
- 220 User has supplied a parameter length that is too short
- 221 User has supplied an index no. that is not on the file
- 222 The sum of the segment lengths exceeds MAXINDEXLEN
- 223 The record number is negative for a Direct Fetch
- 224 No record was found that matches Key and record number
- 225 At least 1 field has overflowed during conversion
- 226 The Key Length of index supplied > KEYSIZE
- 227 The Key Length in NDRB > Actual length
- 228 At least one 1 Index Segment has overflowed
- 229 The value provided in TQPALN for Fetch's is too short to hold the record
- 230 The SGC value in a record to be deleted is nonzero
- 231 An Uplink value in a record does not point to an existing Master
- 232 An attempt was made to Decrement a Master SGC below 0
- 233 An opcode 2 to 10 has issued an invalid lock request
- 234 The user has requested an exclusive database access but some else is using it
- 235 Tried to open a database that is Opened Exclusively by another user
- 236 A Speedbase user has the records locked in an incompatible way
- 237 The lock table for a file has overflowed

238 Record not locked for Delete/Rewrite
 239 The version of the BDCF file is not compatible with this
 version of the NLM
 240 Btrieve returned a Locked record status on a Master Access
 241 A Direct Operation has attempted to read past EOF
 242 A GVA field has overflowed
 243 Permission not available to delete files
 244 Database has a Bad Status and needs rebuilding
 245 A File Rename operation has failed
 246 A user has issued a Write with SubOp = 1 without opening the
 database for rebuilding
 247 The special rebuild-write function has hit EOF
 248 The Write operation has returned a Record Number that is
 greater than 0xFFFFFFFF
 249 The user has issued a TQSUOP that is invalid for TQOPCD
 250 Attempt to rename a converted database has a bad file name
 251 Attempt to open a conversion output without 1st opening input
 252 An invalid conversion was attempted (e.g. character to numeric)
 253 A numeric item has contained a value too large to hold in new
 field
 254 Invalid function for Flat File IO
 255 Short write writing to BCFD file
 256 A record has been defined that is too big for Btrieve or SQL or
 has too many Columns for SQL
 257 User has requested SQL but not available
 258 SQL CREATE DATABASE failed
 259 SQL DELETE DATABASE failed
 260 SQL CREATE TABLE failed
 261 SQL CREATE INDEX failed
 262 SQL Database Not Available
 263 SQL INSERT failed
 264 SQL Get Master failed
 265 SQL Non Unique Master
 266 SQL Update Master failed
 267 SQL Get Record failed
 268 SQL Update Record failed
 269 SQL Delete Record failed
 270 User has requested Btrieve but not available
 271 Invalid Date field for SQL
 272 FIELD_DDF overflow. Use a different DDF set or restructure

C.12 Speedbase and Pervasive SQL Version 7

Pervasive SQL Version 7 (aka Btrieve7) provides the option to create Btrieve databases in either V6.x or V7.x mode. SPEEDBAS.NLM V1.56 is the first externally released version of the Speedbase Btrieve NLM that allows Btrieve databases to be held in V7.x format. The benefits of Btrieve V7.x over V6.x are fully described in the documentation supplied with Pervasive SQL version 7. Although Btrieve V7.x format databases can be larger than the Btrieve V6.x limit of 2Gb (up to a maximum of 64Gb, with Btrieve automatically handling the splitting of a single logical database into a series of 2Gb files), an internal restriction in Speedbase limits the Physical Record Position to 0x7ffffff.

The main operational differences between Btrieve V6.15 and Pervasive SQL Version 7 affects the MicroKernel database engine configuration. Btrieve V6.15 server configuration is performed on the server (see section C.3); Pervasive SQL Version 7 server configuration is performed on a workstation. Please refer to the Pervasive documentation for full details.

Some evaluation versions of SPEEDBAS.NLM, prior to V1.56, included partial support for Btrieve V7.x. If you are upgrading the version of SPEEDBAS.NLM from pre-V1.56 to V1.56 and one, or more, of the Speedbase Btrieve format databases are in Btrieve V7.x format please read the important note in section 4.8.3.

C.13 Speedbase and Pervasive SQL-2000 (aka Btrieve Version 7.5)

The Speedbase NLM is fully supported on Pervasive SQL-2000 (aka Btrieve version 7.5). The considerations for Btrieve version 7 (see section C.12) also apply to SQL-2000.

APPENDIX D – THE SPEEDBASE BTRIEVE OPTION FOR WINDOWS NT

This appendix describes the Speedbase Btrieve option for Windows NT. Appendix C describes the Speedbase Btrieve option for Novell NetWare. In order to prevent un-necessary repetition, several references to Appendix C are made within this appendix.

Important Note: Although the version of the Speedbase Btrieve Gateway distributed on the BACNAT media is always the most recent **QC'ed** version, the latest **internal** revision of the Speedbase Btrieve Gateway is always available, together with related documentation, on the Global web-site.

Important Note: Please refer to section D.13 for the details of a number of changes to the Speedbase Btrieve Gateway, SPEEDBAS.EXE, and the related Speedbase SQL Gateway, released with GSM V8.11 (August/September 2000).

D.1 Hardware and Software Pre-Requisites

The hardware requirements for the Windows NT server are described in the Global Configuration Notes for Windows NT (C5661/69).

The Windows NT Server must be configured with sufficient memory to run the Speedbase Btrieve Gateway and the Btrieve MicroKernel Engine. Due to the extreme flexibility of server hardware configurations, no hard-and-fast rules regarding the minimum memory requirement are possible. However, 64Mb would appear to be the **absolute** minimum.

The Speedbase Btrieve Gateway is supported on Microsoft Windows 98, Windows NT Server V4.0 and Windows 2000.

The version of Btrieve installed on the NT Server **MUST** be V6.15, or later. Btrieve V6.15 must be obtained from Pervasive Software Inc. or a local distributor). Pervasive SQL version 7 (aka Btrieve 7) and Pervasive SQL-2000 (aka Btrieve 7.5) are also supported – see sections D.11 and D.12 for further details. To summarise, the following versions of Btrieve are supported:

- Btrieve V6.15
- Pervasive SQL (aka Btrieve version 7)
- Pervasive SQL-2000 (aka Btrieve version 7.5)

Any Speedbase application module that is to access a Btrieve format Speedbase database must be "Btrieve-aware". This is achieved by recompiling the application with the V8.1h Global Speedbase Development System. Details of the "Btrieve-aware" application products that have been released by Global Business Systems will be announced in Global Technical Bulletins.

Important note: Developers should be aware that the Database Manager within the Speedbase Btrieve Gateway is more stringent than the Global Speedbase Database Manager. Certain dubious, un-documented coding techniques that appear to "work" when used with Global format Speedbase databases may fail, or produce inconsistent results, when used with Btrieve format Speedbase databases. For example, index keys with computational fields that contain strictly negative values should not be used.

D.2 Overview of the Speedbase Btrieve option for Windows NT implementation

The Speedbase Btrieve software is comprised of several modules within

several software layers:

- Speedbase Presentation Manager has been enhanced to recognise and access Btrieve format Speedbase databases (this has resulted in changes to some software modules that comprise Speedbase Presentation Manager and the introduction of a new Memory Page in the P.\$BAPGS library);
- Several Speedbase utilities (e.g. \$BADGN, \$BAST) have been enhanced to recognise Btrieve format Speedbase databases. A new utility, \$BADN, has been introduced to create and maintain Btrieve format Speedbase databases (see section C.6);
- A number of Speedbase Development subroutines have been enhanced to allow Speedbase applications to become "Btrieve aware" merely by recompiling. The following table describes the earliest version of a sub-routine that is "Btrieve aware" for each of the supported Btrieve configurations:

	Sub-routine Version for Btrieve (Novell) (Windows)	Version for Btrieve
	B\$OPN V8.1d	V8.1h (bug fixed in V8.1i - see section 2.7)
	B\$CDB V8.1f	V8.1f
	B\$CLD V8.1d	V8.1d
	B\$STA V8.1d	V8.1d
section 2.7)	B\$XCL V8.1d	V8.1d (bug fixed in V8.1i - see section 2.7)
	B\$RBL V8.1d	V8.1d

Important note: The pre-V8.1i versions of B\$OPN and B\$XCL contained bugs that could result in a STOP 25404 (see section 2.7). **All developers who are producing "Btrieve-aware" applications are strongly advised to recompile using the V8.1i Global Speedbase Development System.**

- The Speedbase Btrieve Gateway (SPEEDBAS.EXE) has been introduced. This module, which is functionally equivalent to the Speedbase Btrieve NLM for the Speedbase Btrieve option for Novell NetWare (see section C.2) runs on the Windows NT Server and interfaces directly to the Btrieve engine (also running on the Windows NT Server);
- The SVC-61 interface for Global System Manager (Windows) configurations has been enhanced to allow Speedbase Presentation Manager, and the various Speedbase utilities, to interface with the Speedbase Btrieve Gateway;
- The Global Client (GLOBAL.EXE) has also been enhanced to allow Speedbase Presentation Manager, and the various Speedbase utilities, to interface with the Speedbase Btrieve Gateway.

All these modules must be present in order for software (i.e. Speedbase utilities or applications) on a Global Client to access a Btrieve format Speedbase database on a Windows NT Server.

The changes to Speedbase Presentation Manager are "transparent" and are immediately available (i.e. no customisation is required) if the software version is GSM V8.1 revision V8.1h, or later. Speedbase

Presentation Manager automatically detects the type of Speedbase database it is operating on.

The changes to the various Speedbase utilities are "transparent" and are immediately available (i.e. no customisation is required) if the software version is GSM V8.1 revision V8.1h, or later. The various Speedbase utilities automatically detect the type of Speedbase database they are operating on, although some utilities will only operate on a particular format of database (e.g. \$BADB will only function on C-ISAM format Speedbase databases; \$BADN (see section C.6) will only function on Btrieve format Speedbase databases).

The changes to the Speedbase subroutines are also transparent and are immediately available (i.e. no customisation is required) if the version of the Speedbase Development System is V8.1h, or later. The subroutines automatically detect the type of database they are operating on.

The Speedbase Btrieve Gateway (SPEEDBAS.EXE) is fully described in section D.4, below.

The changes to the SVC-61 interface are "transparent" and are immediately available (i.e. no customisation is required) if the Global System Manager (Windows) BACNAT variant is V2.2, or later.

The settings in the Registry, which are recognised by the Global Client (GLOBAL.EXE) and Speedbase Gateway (SPEEDBAS.EXE) to enable Speedbase Btrieve are described in section D.5, below. In addition to loading the Speedbase Btrieve Gateway on a Windows NT Server (see section D.4) the only change to a standard Global System Manager (Windows) configuration involves minor modifications to the Registry. No other software changes are required (e.g. no configuration file changes are necessary) in order to allow Speedbase running on a Windows NT or Windows 95 workstation to become "Btrieve aware" so that Global format Speedbase databases can be converted to Btrieve format Speedbase databases; and to allow "Btrieve aware" applications to access Btrieve format Speedbase databases.

D.3 Configuring Btrieve on the Windows NT Server

In order to access Btrieve format Speedbase databases from Global System Manager workstations the Server Edition of the Btrieve V6.15 Microkernel Database Engine **MUST BE** installed on the Windows NT Server. The Speedbase Btrieve Gateway **must** also be running on the Windows NT Server. The Speedbase Btrieve Gateway, SPEEDBAS.EXE, supplements (it does NOT replace) the Global Server, GLSERVER.EXE.

YOU ARE STRONGLY ADVISED TO RUN THE SPEEDBASE BTRIEVE GATEWAY ON A SEPARATE, DEDICATED WINDOWS NT SERVER.

The "Btrieve Microkernel Setup" facility must be used to change the "Target Engine" from "Workstation" to "Server" otherwise a Btrieve error 20 will be reported when an attempt is made to use the Speedbase Btrieve Gateway. The "Target Engine" setting is in the "MKDE Interface" component of the BTI Database Setup Utility.

IMPORTANT NOTE: The Btrieve "Cache Allocation" parameter must be set to at least 2048 to prevent occasional hanging problems when accessing large databases.

The following Btrieve MicroKernel parameters are typical:

File Settings

Open Files	800	
Handles	800	
Record Locks per Client	200	
Index Balancing	Off	
Create files in pre V6.x format		Off
Logging of Selected Files		Off
Create Log File Format	6.x	
Memory Resources		
Cache Allocation	2048	
Communication Buffer Size	16384	
Largest Compressed Record Size	1	
Extended Operation Buffer Size	16	
Sort Buffer Size	0	
Client/System Transactions		
Transactions	15	
Perform Transaction Durability		Off
Operation Bundle Limit		200
Init Time Limit	1000	
Disk I/O Wait Limit		1000
Page Write Group Size	30	
System Resources/Directories		
Active Clients	30	
Worker Threads	1	
I/O Threads	4	
Allocate Resources at Startup		Off
Back to Minimal State if Inactive		On
Home Directory	C:\WIN4S	
Mergesort Temp Sorting Directory		<blank>
Trace Btrieve Operations		
Trace Operations	Off	
Trace File	<n/a>	
Select Operations	<n/a>	
Number of Bytes from Data Buffer		32
Number of Bytes from Key Buffer		32

Important note 1: You are **STRONGLY** advised to use the Btrieve Microkernel Monitor utility to monitor the usage of the various Btrieve resources (e.g. the number of Btrieve handles and record locks).

Important note 2: The amount of disk caching available on the NT server appears to be a crucial factor affecting the performance of Speedbase Btrieve. You are strongly advised to maximise the amount of cache buffers allocated on the server.

Important note 3: For Pervasive SQL 2000 (a.k.a. Btrieve 7.5) the Setup utility has been replaced by the Configuration Manager in the Pervasive Control Centre. Most of the parameters described above can be set using the Configuration Manager. A more complete description will be available in a later version of these notes.

D.4 Installing the Speedbase Btrieve Gateway on the Windows NT Server

Throughout this section references, of the form GOMW-2.x, will be made to the Global System Manager V8.1 Operating Manual (Windows).

The Global System Manager (Windows) installation utility, SETUP.EXE, has been enhanced allow the Speedbase Btrieve Gateway to be installed on a Windows NT Server. Only a single copy of the Gateway can run on a particular Windows NT Server (note that multiple copies of the Global Server, GLSERVER.EXE) can run on a particular NT Server). However, multiple Speedbase Btrieve Gateways can run on multiple Windows NT

Servers.

The "Installation Type" Dialogue Box (see GOMW-2.2.2.5) includes an option to install the Speedbase Gateway. Select this option and choose an installation directory. You are strongly advised to install the Speedbase Gateway in the same directory as the Global Server(s).

A series of Network Parameters must be supplied. The Protocol Sequence is described in GOMW-2.2.3.4.1; the Endpoint is described in GOMW-2.2.3.4.2. **EACH ENDPOINT SPECIFIED FOR EVERY GLOBAL SERVER AND SPEEDBASE BTRIEVE GATEWAY MUST BE UNIQUE AND MUST NOT INTERFERE WITH ANY OTHER SOFTWARE RUNNING ON THE NETWORK.** For example, for the `ncacn_ip_tcp` protocol an Endpoint of 3100 is recommended for the first (only) Speedbase Btrieve Gateway.

Important Note: A serious problem has been found when using the "nclrpc" RPC protocol - see section D.13 for further details.

The Endpoint is the last parameter required for the Speedbase Btrieve Gateway installation. When the Endpoint is supplied, SETUP.EXE will create the required directories, copy the SPEEDBAS.EXE file, create the required Registry entries and construct the Program Group and icons. Information message boxes are displayed to indicate the progress of these activities.

The Speedbase Btrieve Gateway recognises the following ValueNames under the:

`$GLMACH\Speedbase`

sub-key of the Registry:

<code>DiagnosticDisplays</code>	This setting enables Speedbase Btrieve Gateway diagnostics (see section D.6.1 for further details);
<code>Endpoint</code>	This setting is fully explained in GOMW-9.6.1.2.2;
<code>MaxCalls</code>	This setting specified the maximum number of connections that the Speedbase Btrieve Gateway is capable of handling. The default value is set to 99. THIS VALUE MUST BE INCREASED IF MORE THAN 99 GLOBAL CLIENTS ARE LIKELY TO ACCESS THE GATEWAY;
<code>ProtocolSequence</code>	This setting is fully explained in GOMW-9.6.1.2.2. Only the <code>ncacn_ip_tcp</code> protocol (i.e. TCP/IP) is supported by the Speedbase Btrieve Gateway.

Unlike earlier versions (including the version distributed with the Speedbase Btrieve Windows NT Beta-test), the V2.2 version of GLREGED.EXE allows these ValueNames to be modified without recourse to GLREG32.EXE).

See section D.13 for some additional registry entries recognised by the V1.78 Speedbase Gateway.

D.5 Installing a Btrieve aware Global Client

Throughout this section references, of the form GOMW-2.x, will be made to the Global System Manager V8.1 Operating Manual (Windows).

The Global System Manager (Windows) installation utility, SETUP.EXE, has been enhanced allow a Global Client to establish a connection to one, or more, Speedbase Btrieve Gateways.

The "Client - Server Connections" Dialogue Box (see GOMW-2.2.4.10) includes an option to "Attach to a Speedbase Gateway". This new option should only be selected after all the Global Server connections have been established for the Global Client.

When the "Connect to a Speedbase Gateway" option is selected the following Dialogue Boxes will appear:

Speedbase Gateway Name: This free-format string is used to uniquely identify the Speedbase Btrieve Gateway. THIS MUST BE SET TO THE NETWORK COMPUTER NAME OF THE SERVER THAT WILL BE RUNNING THE TARGET GATEWAY (e.g. "global7"). THE IMPORTANCE OF THIS SETTING IS EXPLAINED IN SECTION D.8;

Protocol Sequence: The requests from a Global Client to a Speedbase Btrieve Gateway are routed via a particular network protocol. THIS PROTOCOL SEQUENCE MUST SPECIFY THE SAME PROTOCOL THAT WAS SELECTED WHEN INSTALLING THE SPEEDBASE GATEWAY ON THE TARGET SERVER (SEE SECTION D.4). Only the ncacn_ip_tcp protocol (i.e. TCP/IP) is supported by the Speedbase Btrieve Gateway;

Network Address: The Network Address of the Server that is running the Speedbase Btrieve Gateway must be specified. See GOMW-2.2.4.9.2 for further details;

Endpoint: The Endpoint parameter is fully explained in GOMW-2.2.4.9.3. THIS ENDPOINT MUST BE THE SAME AS THE ENDPOINT THAT WAS SELECTED WHEN INSTALLING THE SPEEDBASE GATEWAY ON THE TARGET SERVER (SEE SECTION D.4);

The Endpoint is the last parameter required for the Global Client installation. When the Endpoint is supplied, SETUP.EXE will complete the Global Client installation and the "Installation Complete" Information Box, described in GOMW-2.2.4.11 will appear. Continue with the Global System Manager installation as described in GOMW-2.3.

The V2.2, or later, Global Client recognises the following ValueNames under the:

\$GLMACH\Speedbase\server_name

sub-key of the Registry (where server_name is the string (e.g. "global7") that uniquely identifies a particular Speedbase Btrieve Gateway):

Endpoint This setting is fully explained in GOMW-8.6.1.2.2;

NetworkAddress This setting is fully explained in GOMW-8.6.1.2.2;

ProtocolSequence This setting is fully explained in GOMW-8.6.1.2.2.

Note that \$GLMACH\Speedbase\server_name is the only free-format sub-key allowed in the Global section of the Registry.

Unlike earlier versions (including the version distributed with the Speedbase Btrieve Windows NT Beta-test), the V2.2 version of GLREGED.EXE allows these ValueNames to be modified without recourse to GLREG32.EXE).

D.6 Loading the Speedbase Btrieve Gateway (SPEEDBAS.EXE) on a Windows NT Server

The installation process (see section D.4) installs the "Speedbase Gateway" Program Item in the Global Program Group specified during the installation. The Command Line for this Program Item is as follows:

```
global_directory\SPEEDBAS.EXE Speedbase
```

THE "Speedbase" COMMAND LINE ARGUMENT IS MANDATORY AND MUST NOT BE CHANGED OR REMOVED.

If an Error Dialogue Box appears regarding the missing file "Wbtrv32.dll" either copy the file from the "Btrieve Win-32 bin" directory (e.g. C:\Bti\Winnt\Win32\Bin\ or use the Control Panel/System Properties/Environment option to add the "Btrieve Win-32 bin" directory to the Windows NT Path variable.

If you wish the Speedbase Btrieve Gateway to be loaded automatically when the Windows NT Server boots, add the appropriate entry to the Start-Up Program Group.

D.6.1 Speedbase Btrieve Gateway Diagnostics option

Important note: You should only select this option if advised to do so by the Global Service Centre. Enabling Gateway diagnostics may slightly impair the performance of the Speedbase Btrieve Gateway.

The Gateway diagnostics option is enabled by using GLREGED.EXE to change the "DiagnosticDisplays" ValueName in the \$GLMACH\Speedbase sub-key to "YES". If this option is enabled, crucial diagnostic information is displayed on the Gateway window.

Important note: Only the values "YES" and "NO" are currently recognised by the Speedbase Btrieve Gateway. Other values such as "On" (or any of the other keywords listed in GOMW-7.2.1) are not recognised.

At the time of writing, the Speedbase Btrieve Gateway does not include an option to write diagnostic information to a "log file".

Important Note: The DiagnosticDisplays ValueName must NOT be removed from the \$GLMACH\Speedbase sub-key of the Registry.

D.7 Loading a Btrieve-aware Global Client

Provided the Registry settings described in section D.5 have been established correctly, and the version of GLOBAL.EXE is V2.2, or later, the Global Client will automatically connect the Global Btrieve Gateway(s). No special action is necessary.

D.8 The \$BADN utility

The \$BADN utility is fully described in section C.6. This section just describes the new features of \$BADN that have been introduced, with the release of GSM PM V8.1h, to support the Speedbase Btrieve option for Windows NT.

The only difference between \$BADN on a Global System Manager (Windows) configuration (i.e. accessing a Btrieve format Speedbase database via the Speedbase Btrieve Gateway) and \$BADN on a Global System Manager

(Novell NetWare) configuration (i.e. accessing a Btrieve format Speedbase database via the Speedbase Btrieve NLM) is in the Create New Database option (i.e. option 1 from the main \$BADN menu).

The reply to the "Novell/NT File Server" prompt MUST be the "Speedbase Gateway Name" specified by the \$GLMACH\Speedbase\server_name sub-key (i.e. the network computer name of the Windows NT Server - see section D.5).

The reply to the "Directory Path for Btrieve Database" prompt must specify an existing directory. This directory name can be specified in one of three ways:

- a simple directory name (e.g. speedbas). The Speedbase Btrieve Gateway will assume the directory is relative to the root directory of the drive it is installed on (i.e. normally C:) so that a reply of speedbas specifies the C:\speedbas directory;
- a full pathname (e.g. D:\speedbas or D\$\speedbas). Note that ":" and "\$" can be used interchangeably;
- a shared directory on the Windows NT Server if the directory name is prefixed by a "@" (e.g. @sharedir).

Note that all these options are displayed on the Help screen for the \$BADN Create Database option.

Important Note 1: When using the \$BADN utility to create and load Btrieve format Speedbase databases it may be more convenient to use terminal type 712 instead of 711.

Important Note 2: Option 6 (Change Path to Database) for the Speedbase Btrieve option on Windows NT, has been implemented in the V8.1i version of \$BADN (see section 2.7). See section C.6.7.1 for further notes on moving Btrieve format Speedbase Databases.

D.9 Open Database format

Please refer to section C.9.

D.10 New STOP and EXIT codes

Please refer to section C.10.

D.11 Speedbase and Pervasive SQL Version 7

Pervasive SQL Version 7 (aka Btrieve7) provides the option to create Btrieve databases in either V6.x or V7.x mode. SPEEDBAS.EXE V1.56 is the first externally released version of the Speedbase Btrieve Gateway that allows Btrieve databases to be held in V7.x format. The benefits of Btrieve V7.x over V6.x are fully described in the documentation supplied with Pervasive SQL version 7. Although Btrieve V7.x format databases can be larger than the Btrieve V6.x limit of 2Gb (up to a maximum of 64Gb, with Btrieve automatically handling the splitting of a single logical database into a series of 2Gb files), an internal restriction in Speedbase limits the Physical Record Position to 0x7ffffff.

Some evaluation versions of SPEEDBAS.EXE, prior to V1.56, included partial support for Btrieve V7.x. If you are upgrading the version of SPEEDBAS.EXE from pre-V1.56 to V1.56 and one, or more, of the Speedbase Btrieve format databases are in Btrieve V7.x format please read the

important note in section 5.6.1.

D.12 Speedbase and Pervasive SQL-2000 (aka Btrieve Version 7.5)

The Speedbase Gateway is fully supported on Pervasive SQL-2000 (aka Btrieve version 7.5). The considerations for Btrieve version 7 (see section D.11) also apply to SQL-2000.

D.13 Changes and Enhancements included in the V1.78 Speedbase Gateways and NLM

The release of GSM V8.11 (see section 2.10) coincided with the release of the GSM (Windows) V3.0 BACNAT software (see section 5.14). The V3.0 release (of GLOBAL.EXE, GLSERVER.EXE etc.) also contains the V1.78 versions of the Speedbase Btrieve and Speedbase SQL Gateways. The V1.78 Speedbase Btrieve NLM (SPEEDBAS.NLM) is available on the Global web-site.

The V1.78 repackaging of the Speedbase Btrieve Gateway and the Speedbase Btrieve NLM includes the following new features:

- A number of minor problems in the GSM (Windows) SQL Server Gateway (SPEEDSQL.EXE) the GSM (Windows) Btrieve Gateway (SPEEDBAS.EXE) and the GSM (Novell) Btrieve Speedbase NLM (SPPEEDBAS.NLM) have been fixed. **ALL SITES USING THE SPEEDBASE BTRIEVE OR SPEEDBASE SQL SERVER OPTIONS SHOULD UPGRADE TO V1.78, OR LATER;**
- A **serious** problem has existed in the calculation of Uplink values in all versions of the Speedbase Btrieve Gateways and Speedbase Btrieve NLM prior to the V1.78 release. This problem only occurs intermittently and doesn't affect actual data records. It occurs when Btrieve reallocates the 1st data block to an Index Block - this usually only happens on large heavily updated databases. The problem has been fixed with the V1.78 release and existing databases can be protected against the problem by a rebuild or conversion run (using the V1.78 Gateway/NLM).

When using the V1.78 Gateway/NLM, old format databases will be continue to be supported before the database is rebuilt. However, until a rebuild is performed the "old format" database will still be susceptible to the error 238 problem (even after an upgrade to the V1.78 Gateway/NLM).

Important Note: It is strongly recommended that all databases be rebuilt (i.e. \$BADN Option 2) after the installation of the V1.78 Speedbase Gateway/NLM.

- The "DiagnosticDisplay" and "DiagnosticLogFile" registry settings are no longer mandatory. The default value for both these options is "Off". Furthermore, a wider range of values are allowed for the "DiagnosticDisplay" and "DiagnosticLogFile" settings Any of the keywords listed in section GOMW-7.2.1 (e.g. "on", "no", "true" etc.) are now recognised;
- A number of performance optimisations have been added to the Speedbase Btrieve Gateway. Sequential Btrieve access to long series of Duplicate Keys now runs significantly faster. The maximum performance increase will occur when a single user is accessing the database during batch processing;

- The Gateway always encloses the SQL database name in square brackets when issuing an SQL command. This allows support for database names that clash with SQL reserved words. Note that if Query Analyzer is used to access the database then the string [databasename] (i.e. rather than just databasename) must be used to access the database;
- The Speedbase Btrieve Gateway, SPEEDBAS.EXE, now supports Pervasive SQL-2000 (aka Btrieve V7.5). The Speedbase SQL Gateway, SPEEDSQL.EXE, is currently being evaluated with Microsoft SQL-2000;
- A new "LogFileFolder" registry setting is now available to specify the directory of the .LDF file. This option allows the creation of the .LDF file on a filing system that is different (larger) than the filing system onto which the Speedbase Gateway has been installed;
- A new "MDFFileFolder" registry setting is now available to specify the directory of the .MDF file. This option allows the creation of the .MDF files on a filing system that is different (larger) than the filing system onto which the Speedbase Gateway has been installed;
- A new "SpeedbaseLogFileFolder" registry setting is now available to specify the directory of the Speedbase log file (SPEEDBAS.LOG). This option allows the creation of the log file file on a filing system that is different (larger) than the filing system onto which the Speedbase Gateway has been installed;
- The Speedbase Btrieve Gateway, SPEEDBAS.EXE is now supported with the Workstation version of Pervasive SQL-2000 (Btrieve V7.5) on Windows 98 providing the Global Client is also running on the same Windows 98 PC. Note that when running \$BADN and the Gateway on the same Windows 98 PC a DOS-style path (e.g. E:\temp) must be specified when locating the BDCF file - a directory specification such as @TEMP (where TEMP is shared-name directory) will **NOT** be recognised when the Gateway is running on Windows 98;
- With the release of Pervasive SQL-2000 the concept of "True NULL date fields" has been added to the Speedbase Btrieve Gateway. Within the Speedbase Database Manager this enhancement only affects Date handling in the Speedbase Btrieve Gateway and Speedbase Btrieve NLM. Other field types such as Numbers and Alphanumerics don't have explicit NULL values in Speedbase.

Prior to Pervasive SQL-2000 (a.k.a. Btrieve V7.5) if a date was "Null" in Speedbase (represented by binary-zero in the PIC 9(6) COMP field) the Btrieve date was also stored as 0 in the 4 bytes allowed for a Btrieve format Date. With Pervasive SQL 2000 a value of binary-zero is treated as an invalid date despite earlier versions of Btrieve treating this value as a defacto standard.

Support has been added to the Speedbase Btrieve Gateway and Speedbase Btrieve NLM to store NULL dates in the new 5-byte format required by Pervasive SQL-2000; and to make appropriate adjustments to the values in the DDF files. Because of the subtle way the DDF file changes have been implemented by Pervasive, files with the new Date formats will still operate correctly with versions of Pervasive Btrieve prior to SQL-2000 (e.g. Btrieve version 7).

Speedbase Btrieve databases created by the V1.78, or later, SPEEDBAS.EXE and SPEEDBAS.NLM will be in the new format. This includes databases created as the result of a database conversion run. Existing databases will be maintained in the old format.

Important Note: A database rebuild operation will NOT change the Date Format.

In exceptional cases where it is required to create a database with "old format" dates a registry key for GSM (Windows) has been provided (the registry key is replaced by a Novell parameter for the Speedbase NLM). The registry key is "PervasiveTrueNullDate" with a default of "On". If this registry option is set to "Off" Speedbase Btrieve format databases will be created in the old format.

This option should be used when using the recommended technique for moving databases between directories where you must make sure you create the new empty database in the same date format as the old database before copying the old over the new.

- The various BDCF files are no longer left open unnecessarily. This avoids a problem that occurred when attempting to open large numbers of databases simultaneously;
- During a database conversion (\$BADN option 4) any "stale" entries in the BDCF files are automatically replaced by the "new" entries derived from the new Data Dictionary;
- The Speedbase Gateway and NLM have been enhanced to return the extended lock information required by 32-bit Speedbase PM;
- After several Speedbase Btrieve database Create functions in the same Windows directory it is possible for the field that holds the allocated field number in FIELD.DDF to overflow. If this overflow condition occurs an error 272 will be returned by the Gateway/NLM.

To avoid this problem the Speedbase Gateway/NLM now includes an option to compress the gaps in the allocated field numbers during Create operations. This option is controlled by the registry setting (Parameter in for SPEEDBAS.NLM) "FieldDDFCompress". The default setting for this option is "Off" because enabling this option can degrade the performance of database Creates. The problem is only likely to affect users with several different Speedbase Btrieve database creates in the same directory (i.e. where the FIELD.DDF file contains the accumulation of all the fields in all the databases);

- A major enhancement has been implemented in the Speedbase Btrieve Gateway and Speedbase Btrieve NLM to export descriptive and meaningful field and record names for use by SQL database access and reporting tools. If you do not wish to provide external access to your Databases by SQL type tools you can ignore this section and leave the "LongNames" option (see below) set to "Off".

The Speedbase Btrieve Gateway and NLM has always provided the ability for external access to the data in the Btrieve databases by the SQL tools provided by Pervasive, Microsoft and other 3rd party products (e.g. Seagate Crystal Reports). However the names used to identify Columns/Fields and Rows/Records have been the internal Speedbase generated names. These names, although providing

uniqueness tend to be rather terse and don't adequately describe the true purpose of the row/column in SQL terms. To overcome this restriction, the "LongName" option has been implemented. This option makes use of the existing Speedbase names together with the Speedbase descriptions in the Speedbase Dictionary.

The V8.11 \$BADN and \$BADS utilities have been enhanced to pass the extra description fields to the Gateway/NLM (see section 2.10). New databases or databases created as a result of a Conversion run will have the necessary information to produce columns/rows with Long Names.

Restrictions in the Btrieve DDF files limit these names to 20 characters and for compatibility this same limit is applied to all variants of the Gateway/NLM including the Microsoft SQL ones.

The use of Long Names is controlled by 3 registry settings (Parameters in Novell for the Speedbase NLM). Databases are created in the format specified by these values at Database Creation time (or Conversion time). THESE OPTIONS HAVE NO EFFECT DURNG NORMAL DATABASE RUN-TIME PROCESSING.

The 3 registry settings are "LongNames" (default "Off"), "UpperCase" (default "Off") and "LongNameType" (default 0). The "UpperCase" and "LongNameType" settings are only recognised if the "LongNames" setting is "On".

There are four variations of the Long Names processing controlled by the value of the LongNameType setting:

LongNameType = 0 (default) This is the original implementation and is fairly robust in that it won't fail with duplicates or reserved words. However the names are somewhat artificial being made up of a combination of the Speedbase Short Name and description;

LongNameType = 1 This option uses just the description fields from the Speedbase Dictionary to produce the Long Names. The only editing is to leave System Field Names as Short Names and replace spaces between words with the "_" (underscore) character. THE DEVELOPER MUST BE VERY CAREFUL TO AVOID DUPLICATES OR RESERVED WORDS WHEN MAINTAINING THE DESCRIPTIVE FIELDS IN THE SPEEDBASE DICTIONARY;

LongNameType = 2 This is similar to type 1 but allows for duplicates by appending _n to duplicate names. It also replaces a leading numeric with an _ to avoid problems with Microsoft SQL. **THIS OPTION IS STRONGLY RECOMMENDED;**

LongNameType = 3 This is the same as type 2 for column/field names but Table/Record names are prefixed by the BDCFFilename_. This option allows multiple databases

with the same title fields for records in the same directory.

If the "UpperCase" setting is enabled the characters in the description are converted to upper-case;

- A **serious** problem has been discovered when either SPEEDBAS.EXE or SPEEDSQL.EXE is used with the "ncalrpc" RPC protocol. Although this problem exists in the released V1.78 Gateways, it has been fixed in an evaluation release (V1.83), which is available upon request. If you are using the "ncalrpc" protocol you are strongly advised to switch to the "ncacn_ip_tcp" RPC protocol or to install the V1.83 Gateway.

APPENDIX E – THE SPEEDBASE SQL SERVER OPTION FOR WINDOWS NT

This appendix describes the Speedbase SQL Server option for Windows NT. Appendix D describes the Speedbase Btrieve option for Windows NT. In order to prevent unnecessary repetition, several references to Appendix D are made within this appendix.

Important Note: Although the version of the Speedbase SQL Server Gateway distributed on the BACNAT media is always the most recent **QC'ed** version, the latest **internal** revision of the Speedbase SQL Server Gateway is always available, together with related documentation, on the Global web-site.

Important Note: Please refer to section D.13 for the details of a number of changes to the Speedbase SQL Gateway, SPEEDSQL.EXE, and the related Speedbase Btrieve Gateway, released with GSM V8.11 (August/September 2000).

E.1 Hardware and Software Pre-Requisites

The hardware requirements for the Windows NT server are described in the Global Configuration Notes for Windows NT (C5661/69).

The Windows NT Server must be configured with sufficient memory to run the Speedbase SQL Server Gateway and Microsoft SQL Server. Due to the extreme flexibility of server hardware configurations, no hard-and-fast rules regarding the minimum memory requirement are possible.

IMPORTANT NOTE: Microsoft SQL Server makes extreme demands on the server resources. Unless the server is configured with sufficient disk, memory and CPU resource to run the SQL Server database engine adequately the performance of Speedbase SQL Server will degrade.

For those users who are familiar with the relatively low hardware demands of Global format Speedbase, Btrieve and the Speedbase Btrieve Gateway the high hardware demands of SQL Server must be fully appreciated and taken into account when specifying the hardware requirements of the SQL Server NT server.

For example, the SQL Server Gateway was developed on an IBM Netfinity 3500 with dual 350MHz Pentium II processors with 128Mb of memory. This configuration represents an “entry-level” SQL Server server specification.

The Speedbase SQL Server Gateway is only supported on Microsoft Windows NT Server V4.0.

The version of Microsoft SQL Server **MUST** be the Standard Edition of version 7. The Desktop version of SQL Server version 7 is **NOT** supported. Although SQL Server V6.5 was supported for the beta-test of Speedbase SQL Server it is **NOT** supported for released versions of the Speedbase SQL Server option.

Important Note: At the time of writing the Speedbase SQL Server Gateway is being certified for use with Microsoft SQL-2000. Initial investigations indicate that some changes to the Gateway will be necessary.

Microsoft SQL Server must be obtained from Microsoft or a local distributor.

Any Speedbase application module that is to access a SQL Server format Speedbase database must be "SQL Server aware". This is achieved by recompiling the application with the V8.1h Global Speedbase Development System (i.e. the same requirements for a "Btrieve on NT aware" application).

Any application that is already "Btrieve on NT aware" requires no changes to access Speedbase SQL Server databases.

Details of the "Btrieve-aware" application products that have been released by Global Business Systems have been announced in Global Technical Bulletins.

Important note: Developers should be aware that the Database Manager within the Speedbase SQL Server Gateway is more stringent than either the Global Speedbase Database Manager or the Speedbase Btrieve Gateway. Certain dubious, un-documented coding techniques that appear to "work" when used with Global format and Btrieve format Speedbase databases may fail, or produce inconsistent results, when used with SQL Server format Speedbase databases. For example, index keys with computational fields that contain strictly negative values should not be used. See section E.9 for further details.

E.2 Overview of the Speedbase SQL Server option for Windows NT implementation

The Speedbase SQL Server software is comprised of several modules within several software layers:

- Speedbase Presentation Manager has been enhanced to recognise and access SQL Server format Speedbase databases (this has resulted in changes to some software modules that comprise Speedbase Presentation Manager and the introduction of a new Memory Page in the P.\$BAPGS library);
- Several Speedbase utilities (e.g. \$BADGN, \$BAST) have been enhanced to recognise SQL Server format Speedbase databases. A new utility, \$BAD5, has been introduced to create and maintain SQL Server format Speedbase databases (see section E.8). For those users familiar with Speedbase Btrieve, \$BAD5 is functionally equivalent to \$BADN;
- A number of Speedbase Development subroutines have been enhanced to allow Speedbase applications to become "Btrieve & SQL Server aware" merely by recompiling. The following table describes the earliest version of a sub-routine that is "Btrieve & SQL Server aware":

Sub-routine	Version for SQL Server
B\$OPN	V8.1h, or later (bug fixed in V8.1i - see section 2.7)
B\$CDB	V8.1f, or later
B\$CLD	V8.1d, or later
B\$STA	V8.1d, or later
B\$XCL	V8.1d, or later (bug fixed in V8.1i - see section 2.7)
B\$RBL	V8.1d, or later
B\$STB	V8.1k, or later

Important Note 1: The pre-V8.1i versions of B\$OPN and B\$XCL contained bugs that could result in a STOP 25404 (see section 2.7). All

developers who are producing "Btrieve & SQL-aware" applications are strongly advised to recompile using the V8.1i Global Speedbase Development System.

Important Note 2: The B\$STB routine is provided as an alternative to B\$STA for large databases. See section 2.6 for further details.

- The Speedbase SQL Server Gateway (SPEEDSQL.EXE) has been introduced. This module, which is functionally equivalent to the Speedbase Btrieve Gateway (SPEEDBAS.EXE – see section D.2) and the Speedbase Btrieve NLM for the Speedbase Btrieve option for Novell NetWare (see section C.2) runs on the Windows NT Server and interfaces directly to the SQL Server engine (also running on the Windows NT Server).

In addition to the standard SQL Server Gateway, SPEEDSQL.EXE, a dual Btrieve/SQL Server Gateway, SPEEDGAT.EXE, is also available. SPEEDGAT.EXE should only be used if BOTH Btrieve format Speedbase databases and SQL Server format Speedbase databases are to be accessed on the same server. Consequently, SPEEDGAT.EXE is only required for specialised installations and is not described in this appendix although the various considerations for SPEEDSQL.EXE also apply to SPEEDGAT.EXE;

- The SVC-61 interface for Global System Manager (Windows) configurations has been enhanced to allow Speedbase Presentation Manager, and the various Speedbase utilities, to interface with the Speedbase SQL Server Gateway;
- The Global Client (GLOBAL.EXE) has also been enhanced to allow Speedbase Presentation Manager, and the various Speedbase utilities, to interface with the Speedbase SQL Server Gateway.

All these modules must be present in order for software (i.e. Speedbase utilities or applications) on a Global Client to access a SQL Server format Speedbase database on a Windows NT Server.

The changes to Speedbase Presentation Manager are "transparent" and are immediately available (i.e. no customisation is required) if the software version is GSM V8.1 revision V8.1h, or later. Speedbase Presentation Manager automatically detects the type of Speedbase database it is operating on.

The changes to the various Speedbase utilities are "transparent" and are immediately available (i.e. no customisation is required) if the software version is GSM V8.1 revision V8.1g, or later. The various Speedbase utilities automatically detect the type of Speedbase database they are operating on, although some utilities will only operate on a particular format of database (e.g. \$BADB will only function on C-ISAM format Speedbase databases; \$BADN (see section C.6) will only function on Btrieve format Speedbase databases; \$BADS (see section E.8) will only operate on SQL Server format Speedbase databases).

The changes to the Speedbase subroutines are also transparent and are immediately available (i.e. no customisation is required) if the version of the Speedbase Development System is V8.1h, or later. The subroutines automatically detect the type of database they are operating on.

The Speedbase SQL Server Gateway (SPEEDSQL.EXE) is fully described in section E.4, below.

The changes to the SVC-61 interface are "transparent" and are immediately available (i.e. no customisation is required) if the Global System Manager (Windows) BACNAT variant is V2.2, or later.

The settings in the Registry, which are recognised by the Global Client (GLOBAL.EXE) and Speedbase Gateway (SPEEDSQL.EXE) to enable Speedbase SQL Server are described in section E.5, below. In addition to loading the Speedbase SQL Server Gateway on a Windows NT Server (see section E.4) the only change to a standard Global System Manager (Windows) configuration involves minor modifications to the Registry. No other software changes are required (e.g. no configuration file changes are necessary) in order to allow Speedbase running on a Windows NT or Windows 95 workstation to become "SQL Server aware" so that Global format Speedbase databases can be converted to SQL Server format Speedbase databases; and to allow "SQL Server aware" applications to access SQL Server format Speedbase databases.

E.3 Installing and Configuring SQL Server on the Windows NT Server

In order to access SQL Server format Speedbase databases from Global System Manager workstations the "Database Server – Standard Edition" of SQL Server V7.0 must be installed on the Windows NT Server. The Speedbase SQL Server Gateway is not supported on the "Database Server – Desktop Edition" of SQL Server V7.0. The Speedbase SQL Server Gateway **must** also be running on the Windows NT Server. The Speedbase SQL Server Gateway, SPEEDSQL.EXE, supplements (it does NOT replace) the Global Server, GLSERVER.EXE.

YOU ARE STRONGLY ADVISED TO RUN THE SPEEDBASE SQL SERVER GATEWAY ON A SEPARATE, DEDICATED WINDOWS NT SERVER.

IMPORTANT NOTE: A "CUSTOM INSTALLATION" OF SQL SERVER, RATHER THAN A "DEFAULT INSTALLATION" MUST BE PERFORMED IN ORDER TO SELECT SOME OF THE MANDATORY OPTIONS DESCRIBED BELOW.

When installing SQL Server the following options in the "Character Set/Sort Order/Unicode Collation" Dialogue Box **MUST** be selected:

Character set = 850 Multilingual;

Sort Order = Binary order;

Unicode Collation = Binary order.

The Speedbase SQL Gateway will report a fatal error if the Sort Order is not set to "Binary order".

After installing SQL Server, the SQL Server Enterprise Manager must be used to perform some post-installation customisation.

THE FOLLOWING POST-INSTALLATION CUSTOMISATIONS ARE VITAL. THE SPEEDBASE SQL SERVER WILL NOT OPERATE CORRECTLY AND WILL FAIL WITH A VARIETY OF ERRORS IF THE PERMISSIONS FOR THE SPEEDBASE SQL USER ARE NOT SET CORRECTLY.

1. Double click on the SQL Server Group/server_name/Security/Logins key. Right click and select the New Login option.
 - 1.1 In the “General” tab select the “SQL Server Authentication” option to add a new “Name and Password”. The User Name and Password will be used during the Speedbase Gateway installation (see below). **The User Name and Password supplied here MUST match the “SpeedbaseSQLUser” and “SpeedbaseSQLPassword” entries in the registry (see section E.4).**
 - 1.2 In the “Server Roles” tab, enable the “System Administrator” option. There should not be any need to enable any of the other options (i.e. Security Administrator, Server Administrator, Setup Administrator, Process Administrator, Disk Administrator, Database Creator);
 - 1.3 In the “Database Access” tab, permit the user just added for the “master” database;
2. Select the SQL Server Group/server_name/Databases/Master key. Right click and select the Properties option. Select the “Permissions” tab and enable the following properties for the user on the “master” database:
 - CreateDB
 - CreateTable
 - CreateView
 - CreateSP
 - CreateDefault
 - CreateRule

Note that there is no need to enable either the BackupDB or BackupLog options.
3. There is no need to set the Database Expansion Parameters. The size specified in \$BADs (see below) is passed to the Database Create function as the initial size of the database.

E.4 Installing the Speedbase SQL Server Gateway on the Windows NT Server

Throughout this section references, of the form GOMW-2.x, will be made to the Global System Manager V8.1 Operating Manual (Windows).

The Global System Manager (Windows) installation utility, SETUP.EXE, has been enhanced to allow either the Speedbase Btrieve Gateway or the Speedbase SQL Server Gateway to be installed on a Windows NT Server. Only a single copy of the Gateway can run on a particular Windows NT Server. However, multiple Speedbase Gateways can run on multiple Windows NT Servers.

The "Installation Type" Dialogue Box (see GOMW-2.2.2.5) includes an option to install the Speedbase SQL Server Gateway. Select this option and choose an installation directory. If you are installing the Speedbase SQL Server Gateway on a server that is also running a Global Server(s) you are strongly advised to install the Speedbase SQL Server Gateway in the same directory as the Global Server(s). However, please take note of the recommendation to run the Speedbase SQL Server Gateway on a separate, dedicated Windows NT server.

A series of Network Parameters must be supplied. The Protocol Sequence is described in GOMW-2.2.3.4.1; the Endpoint is described in GOMW-2.2.3.4.2.

EACH ENDPOINT SPECIFIED FOR EVERY GLOBAL SERVER AND SPEEDBASE SQL SERVER GATEWAY MUST BE UNIQUE AND MUST NOT INTERFERE WITH ANY OTHER SOFTWARE RUNNING ON THE NETWORK.

For example, for the `ncacn_ip_tcp` protocol an Endpoint of 3100 is recommended for the first (only) Speedbase SQL Server Gateway.

The Endpoint is the last Network parameter required for the Speedbase SQL Server Gateway installation. When the Endpoint is supplied, SETUP.EXE will prompt for the following options:

SQL Server User

SQL Server Password

Default Database Size

These options are fully described below.

The Default Database Size is the last parameter required for the Speedbase SQL Server Gateway installation. When the Default Database Size parameter is supplied, SETUP.EXE will create the required directories, copy both the SPEEDSQL.EXE and SPEEDGAT files, create the required Registry entries and construct the Program Group and icons. Information message boxes are displayed to indicate the progress of these activities.

The Speedbase Btrieve Gateway recognises the following ValueNames under the:

`$GLMACH\Speedbase`

sub-key of the Registry:

DefaultDatabaseSize This setting should be set to the size, in megabytes, that is to be allocated for a New Database if the size hasn't been specified in \$BADS (see below).

DiagnosticDisplays This setting enables Speedbase SQL Server diagnostics (see section E.6.1 for further details). Note that some early versions of the SQL Server Gateway expect this option to be mandatory;

DiagnosticLogfile This setting also enables Speedbase SQL Server diagnostics (see section E.6.1 for further details). Note that some early versions of the SQL Server Gateway expect this option to be mandatory;

Endpoint This mandatory setting is fully explained in GOMW-9.6.1.2.2;

FastConversion Enable the "Fast Conversion Run" option to increase the performance of \$BADS option 2 (Rebuild database) and option 4 (Convert

database). When this customisation is enabled the Speedbase SQL Server Gateway will process 20 records (instead of the default of 1) in a Rebuild or Conversion before sending a message back to the originating Global Client (unless an error occurs). This option reduces the traffic on the network but MAY cause the Speedbase SQL Server Gateway to swamp other tasks running on the same server;

IdentityFillin

By default, write operations handled by the Speedbase SQL Gateway will create a monotonically increasing Identity Field. This field has an absolute limit of 8,388,607 (i.e. 0x7ffffff). Identity Fields for deleted records won't be automatically be re-used unless this option is enabled or the maximum number is reached. Note that a database Rebuild or Conversion will have the effect of squeezing out the Identity Field holes.

Important note: The use of this option will slow down write operations dramatically. This option should only be enabled for emergency use until a database rebuild can be performed;

MaxCalls

This setting specified the maximum number of connections that the Speedbase SQL Server Gateway is capable of handling. The default value is set to 99. THIS VALUE MUST BE INCREASED IF MORE THAN 99 GLOBAL CLIENTS ARE LIKELY TO ACCESS THE GATEWAY;

ProtocolSequence

This mandatory setting is fully explained in GOMW-9.6.1.2.2. Only the ncacn_ip_tcp protocol (i.e. TCP/IP) is supported by the Speedbase SQL Server Gateway;

SpeedbaseSQLPassword

This mandatory setting should be set to the Password associated with the User Name required for the Speedbase SQL Gateway in order to login to SQL Server (i.e. the Password that was specified in the SQL Enterprise Manager dialogue – see above);

SpeedbaseSQLUser

This mandatory setting should be set to the User Name that the Speedbase SQL Gateway is to use to login to SQL Server (i.e. the User Name that was specified in the SQL Enterprise Manager dialogue – see above).

The various settings shown in bold are mandatory and must be supplied otherwise the Gateway will display a dialogue box.

E.5 Installing a SQL Server aware Global Client

Throughout this section references, of the form GOMW-2.x, will be made to the Global System Manager V8.1 Operating Manual (Windows).

The Global System Manager (Windows) installation utility, SETUP.EXE, has

been enhanced allow a Global Client to establish a connection to one, or more, Speedbase SQL Server Gateways.

The "Client - Server Connections" Dialogue Box (see GOMW-2.2.4.10) includes an option to "Attach to a Speedbase Gateway". This new option should only be selected after all the Global Server connections have been established for the Global Client.

When the "Connect to a Speedbase Gateway" option is selected the following Dialogue Boxes will appear:

Speedbase Gateway Name: This free-format string is used to uniquely identify the Speedbase SQL Server Gateway. THIS MUST BE SET TO THE NETWORK COMPUTER NAME OF THE SERVER THAT WILL BE RUNNING THE TARGET GATEWAY (e.g. "global7"). THE IMPORTANCE OF THIS SETTING IS EXPLAINED IN SECTION E.8;

Protocol Sequence: The requests from a Global Client to a Speedbase SQL Server Gateway are routed via a particular network protocol. THIS PROTOCOL SEQUENCE MUST SPECIFY THE SAME PROTOCOL THAT WAS SELECTED WHEN INSTALLING THE SPEEDBASE GATEWAY ON THE TARGET SERVER (SEE SECTION E.4). Only the ncaen_ip_tcp protocol (i.e. TCP/IP) is supported by the Speedbase SQL Server Gateway;

Network Address: The Network Address of the Server that is running the Speedbase SQL Server Gateway must be specified. See GOMW-2.2.4.9.2 for further details;

Endpoint: The Endpoint parameter is fully explained in GOMW-2.2.4.9.3. THIS ENDPOINT MUST BE THE SAME AS THE ENDPOINT THAT WAS SELECTED WHEN INSTALLING THE SPEEDBASE GATEWAY ON THE TARGET SERVER (SEE SECTION D.4);

The Endpoint is the last parameter required for the Global Client installation. When the Endpoint is supplied, SETUP.EXE will complete the Global Client installation and the "Installation Complete" Information Box, described in GOMW-2.2.4.11 will appear. Continue with the Global System Manager installation as described in GOMW-2.3.

The Global Client recognises the following ValueNames under the:

\$GLMACH\Speedbase\server_name

sub-key of the Registry (where server_name is the string (e.g. "global7") that uniquely identifies a particular Speedbase SQL Server Gateway):

Endpoint	This setting is fully explained in GOMW-8.6.1.2.2;
NetworkAddress	This setting is fully explained in GOMW-8.6.1.2.2;
ProtocolSequence	This setting is fully explained in GOMW-8.6.1.2.2.

Note that \$GLMACH\Speedbase\server_name is the only free-format sub-key allowed in the Global section of the Registry.

E.6 Loading the Speedbase SQL Server Gateway (SPEEDSQL.EXE) on a Windows NT Server

The installation process (see section E.4) installs the "Speedbase Gateway" Program Item in the Global Program Group specified during the installation. The Command Line for this Program Item is as follows:

```
global_directory\SPEEDSQL.EXE Speedbase
```

THE "Speedbase" COMMAND LINE ARGUMENT IS MANDATORY AND MUST NOT BE CHANGED OR REMOVED.

If you wish the Speedbase SQL Server Gateway to be loaded automatically when the Windows NT Server boots, add the appropriate entry to the Start-Up Program Group.

E.6.1 Speedbase Btrieve Gateway Diagnostics options

Important note: You should only select these options if advised to do so by the Global Service Centre. Enabling Gateway diagnostics may slightly impair the performance of the Speedbase SQL Server Gateway.

The first Gateway diagnostics option is enabled by using GLREGED.EXE to change the "DiagnosticDisplays" ValueName in the \$GLMACH\Speedbase sub-key to "YES". If this option is enabled, crucial diagnostic information is displayed on the Gateway window.

The second Gateway diagnostics option is enabled by using GLREGED.EXE to change the "DiagnosticLogFiles" ValueName in the \$GLMACH\Speedbase sub-key to "YES". If this option is enabled, crucial diagnostic information is written a log-file SPEEDBAS.LOG in the Global directory.

Important note: Unlike early versions of the Speedbase SQL Gateway, values other than "YES" and "NO", such as "On" and "Off" (or any of the other keywords listed in GOMW-7.2.1), are recognised by the Speedbase SQL Server Gateway. Note that any of the affirmative keys listed in GOMW-7.2.1 (e.g. "Yes", "YES", "yes") will enable the diagnostics. All other words will disable diagnostics.

E.7 Loading a SQL Server-aware Global Client

Provided the Registry settings described in section E.5 have been established correctly, and the version of GLOBAL.EXE is V2.2, or later, the Global Client will automatically connect the Global SQL Server Gateway(s). No special action is necessary.

E.8 The \$BADS utility

The \$BADS utility is functionally equivalent to the \$BADN utility provided for the Speedbase Btrieve option (see sections C.6 and D.8). This section just describes the new features of \$BADS that have been introduced, with the release of GSM PM V8.1j, to support the Speedbase SQL Server option for Windows NT.

The only dialogue differences between \$BADS and \$BADN are:

- The \$BADS "Change Path to Database" option (option 6) is not supported by \$BADS;
- The addition of an extra Pop-Up Window in option 1 from the main \$BADS menu that allows the user to Specify the Size of the SQL Database to be created and its name. If the Database Size is not specified, the default filesize specified in the registry (see section E.4) will be used.

Although, it is extremely difficult to calculate exactly, the size of

the SQL Server database should be roughly 4 times the size of the equivalent Global format database.

The reply to the "Novell/NT File Server" prompt MUST be the "Speedbase Gateway Name" specified by the \$GLMACH\Speedbase\server_name sub-key (i.e. the network computer name of the Windows NT Server - see section E.5).

The reply to the "Directory Path for Btrieve/SQL Database" should be a directory, relative to the root directory, on the Windows NT Server that is running the Speedbase SQL Server Gateway process. This directory name can be specified in one of three ways:

- a simple directory name (e.g. speedbas). The Speedbase SQL Server Gateway will assume the directory is relative to the root directory of the drive it is installed on (i.e. normally C:) so that a reply of speedbas specifies the C:\speedbas directory;
- a full pathname (e.g. D:\speedbas or D\$\speedbas). Note that ":" and "\$" can be used interchangeably;
- a shared directory on the Windows NT Server if the directory name is prefixed by a "@" (e.g. @sharedir).

Note that all these options are displayed on the Help screen for the \$BADs Create Database option.

The Windows files created when a Speedbase SQL Server database is created are called:

dbname.MDF
and:
dbname.LDF

where dbname is Database Name supplied in the \$BADs dialogue.

If the reply to the \$BADs Database Name prompt is <CR> (i.e. if a database name is not supplied) the Gateway generates the following filenames:

SP_name_nnnn_xxxxx_mm.MDF
and:
SP_name_nnnn_xxxxx_mm.LDF

where: name Database name from the Speedbase Data Dictionary
nnnn Database version number from the Speedbase Data Dictionary
xxxxx BDCF file name
mm Number, from 00, to make the name unique to SQL

E.90 Open Database format

SQL Server is a full Database Manager and as such it validates all Fields (Columns in SQL terminology). This extra validation has made it necessary for the Gateway to do some special conversions on Alpha-numeric and Date fields.

For Alpha-numeric fields:

- If a field, described as a PIC X(n) in Speedbase, is all binary zeros and it is not part of a Key then it is stored as a NULL in

SQL. Partial binary zero fields and total binary zero fields that are parts of Keys are stored with the binary zeros in the fields. If fields with binary zeros included are displayed by Utilities such as Interactive SQL then subsequent fields on the same line are not displayed correctly. The storing of some fields as NULL's helps to partially overcome this problem, unfortunately storing Alpha-numeric Key Segments as NULL's causes other problems in sequencing records.

For Date fields:

- Date fields with the binary value of LOW-VALUES (i.e. 0x000000) are stored as a NULL Date by the Speedbase SQL Server Gateway. Note that the Speedbase Btrieve Gateway stores a zero date as a Zero Date;
- Date fields with the binary value of 8000000 are stored as 1/1/2800 by the Speedbase SQL Server Gateway. This date is a valid date above the maximum date that can be stored in Global. This is a special Date used in parts of Global 3000. The Speedbase Btrieve Gateway does not treat this date specially;
- Date fields with the binary value of HIGH-VALUES (i.e. 0xFFFFFFFF) are stored as 31/12/9999 by the SQL Server Gateway. This date is a valid date above the maximum date that can be stored in Global. This is a special Date used in parts of Global 3000. The Speedbase Btrieve Gateway does not treat this date specially;
- Date fields with the binary value of SPACES (i.e. 0x202020) are stored as 31/12/2799 by the SQL Server Gateway. This date, which is the maximum valid date that can be stored in SQL, is a valid date above the maximum date that can be stored in Global. This is a special Date used in parts of Global 3000. The Speedbase Btrieve Gateway does not treat this date specially;
- Dates that are negated are stored as the original Date biased by the year 3000. This is a special Date used in parts of Global 3000 applications. The Speedbase Btrieve Gateway does not treat these dates specially.

E.10 Speedbase SQL Server Gateway Error Codes

The full list of error codes in section C.11 has been updated to include Speedbase SQL Server Gateway error codes.

APPENDIX F – THE 32-BIT RUN-TIME ENVIRONMENT AND DEVELOPMENT SYSTEM

This Appendix has been moved to the (draft) Global Development Manual.

APPENDIX G – REMOVING THE CONFIGURATION FILE FROM GSM (WINDOWS)

This appendix describes the changes that have been implemented to remove the requirement for the Global Configuration files in GSM (Windows) configurations. A more complete technical description can be found in a White Paper on the Technology section of the Global web-site (see www.global3000.com/varworld/technolo/whitepap.html).

G.1 Introduction

All the options currently held in the Configuration File have been replaced by new settings in the Global section of the registry. All these new “configuration file” registry settings are identified by an initial “+” character in the ValueName (e.g. +NumberOfFileChannels).

Important Note: Some pre-release versions of GLMACH.TLT contained a number of “configuration file” registry settings that started with the “%” character. These “%” registry settings have been withdrawn and do not appear in release versions of GLMACH.TLT. If any “%” registry settings appear when using GLREGED.EXE they should be deleted immediately to avoid possible confusion.

The changes to implement the configuration file removal option have been localised in a software module known as the “Steering Routine”. This module is responsible for the control-block and buffer allocation within GLOBAL.EXE, GLCONS.EXE and GLSERVER.EXE. The term “Steering Routine” is used throughout this appendix.

The 2 phase nature of CFUPDATE has been replaced by a combination of GLREGED.EXE and the extended functionality of the Steering Routine (within GLOBAL.EXE, GLCONS.EXE and GLSERVER.EXE): The extra ValueNames included in the GLMACH.TLT file (see below) have resulted in GLREGED.EXE effectively replacing the Edit phase of CFUPDATE (i.e. \$INST1). The extra functionality in the Steering Routine to generate internal control blocks dynamically has effectively replaced the Generate phase of CFUPDATE (i.e. \$INST2).

G.1.1 Enabling the Configuration File removal

By default, for the V3.0 revision of GSM (Windows) the option to ignore the configuration file is **disabled**. This is to provide compatibility with all existing installations. To enable the new option (i.e. to ignore the configuration file) and to use the registry settings for **ALL** nucleus customisations for the Global Client (i.e. GLOBAL.EXE or GLCONS.EXE) the following registry setting must be established:

```
..\Global\Client\UseConfigurationFile=Off
```

The default setting of the UseConfigurationFile ValueName is “On”.

Important note: The option to ignore the configuration file **MUST** be disabled when installing Global System Manager (i.e. **THE UseConfigurationFile SETTING MUST BE SET TO “On” WHEN LOADING FROM BACRES**).

To enable the new option (i.e. to ignore the configuration file) and to use the registry settings for **ALL** nucleus customisations for the Global Server (i.e. GLSERVER.EXE) one of the following registry settings must be established:

```
..\Global\Servers\UseConfigurationFile=Off    (all servers default)
or:
```

..\Global\Servers\%\UseConfigurationFile=Off (server specific)

(where % is the server letter between A and Z).

The server-specific option, if established, is used in preference to the "all servers" option, for the relevant server. The technique of supplying an "all servers" default option in addition to a "server specific" option, is used throughout the implementation.

The default setting of the UseConfigurationFile ValueName is "On".

G.1.2 Enabling diagnostics

The internal control block generation and emulation process, which effectively synthesises a Configuration File, is highly complex. Consequently, copious diagnostics are provided to troubleshoot problems. The diagnostic option, which generates a large (e.g. 100Kb) text-file in the Global "log" directory, is enabled by a number of registry settings. To enable diagnostics for the Global Client (i.e. GLOBAL.EXE or GLCONS.EXE) the following registry setting must be established:

..\Global\Client\Diagnostics\LogConfigurationSynthesis=On

When Client diagnostics are enabled the log-file "config.log" is produced.

To enable diagnostics for the Global Server (i.e. GLSERVER.EXE) one of the following registry settings must be established:

..\Global\Servers\Diagnostics\LogConfigurationSynthesis=On (all servers default)

or:

..\Global\Servers\%\Diagnostics\LogConfigurationSynthesis=On (server specific)

(where % is the server letter between A and Z).

The server-specific option, if established, is used in preference to the "all servers" option, for the relevant server.

When Server diagnostics are enabled the log-file "config%.log" is produced (where % is the server letter between A and Z).

G.1.3 Compatibility

Although several new registry settings are available to fully emulate the Configuration File, a large amount of effort has been expended to provide sensible defaults for the "+" options that have not been specified in the registry. In some cases, the default merely involves a hard-coded "fall back" value. However, in other cases, particularly in the Direct Access controller section, entire registry structures are emulated based on the existing de facto registry settings (see section G.3 for full details).

IN GENERAL, IT SHOULD BE POSSIBLE TO REMOVE THE USE OF THE CONFIGURATION FILE MERELY BY SETTING THE UseConfigurationFile SETTING TO "Off". NO BULK ADDITION OF "+" VALUENAMES SHOULD BE REQUIRED.

The individual sections (below) describe the default handling for all the new registry settings.

G.1.4 Error Handling

Both phases of CFUPDATE include several types of error checking and validation. Until more validation and error-checking is added to GLREGED.EXE all error checking must be performed at run-time by the Steering Routine while GLOBAL.EXE, GLCONS.EXE or GLSERVER.EXE are initialising. Any error condition will be signaled by the appearance of a Dialogue Box describing the precise details. In general, the Global Client or Global Server will continue to load after an error condition. However, all messages should be treated as errors (i.e. rather than warnings) and the Global Client or Global Server should be immediately closed to allow the registry to be updated to correct the error condition.

All error messages are written to the log-file (see section G.1.2).

G.1.5 Appendix Structure

The remainder of this appendix describes the registry changes in complete detail. Each section corresponds to a section in the CFUPDATE dialogue. Note that some of the prompts and concepts described below are suppressed when running CFUPDATE on an “external serial number”.

G.2 The MACHINE NAME & BOOTSTRAP MESSAGE section

The external dialogue in the MACHINE NAME section consists of a single prompt for the 15-character Machine Name. For the Global Client, the Machine Name is emulated by the following setting:

```
..\Global\Client\Nucleus\+ConfigurationDescription
```

A default name of “Windows NT” is assumed.

This section of CFUPDATE also establishes the Machine Code (“W1”), Sub-Code (1), Architecture Code (“W”) and default System Manager Code (4). All of these values are effectively hard-coded in the Steering Routine and cannot be altered by registry settings. Note also that the Machine Code is set to “W2” when the Steering Routine is running within GLSERVER.EXE. This parameter is never used externally but must be set up internally to ensure the correct entries in the controller load table are used.

The internal fields that log the date, time and operator-id of the last update to the configuration file are not emulated. However, the Configuration File name, which appears in the \$S report, is emulated by the following setting:

```
..\Global\Client\Nucleus\+SynthesizedConfigurationFileName
```

A default name of “++566SYN” is assumed.

Although the 400 character (i.e. 10 lines, each of 40 characters) bootstrap message is largely ignored on GSM (Windows) it will still appear if the “D” option is used as the \$MONITOR “Target System”. For completeness, the Bootstrap Message is emulated by the following settings:

```
..\Global\Client\Nucleus\+InitialMessage0
..\Global\Client\Nucleus\+InitialMessage1
..\Global\Client\Nucleus\+InitialMessage2
..\Global\Client\Nucleus\+InitialMessage3
..\Global\Client\Nucleus\+InitialMessage4
..\Global\Client\Nucleus\+InitialMessage5
..\Global\Client\Nucleus\+InitialMessage6
```

```

..\Global\Client\Nucleus\+InitialMessage7
..\Global\Client\Nucleus\+InitialMessage8
..\Global\Client\Nucleus\+InitialMessage9

```

The default for each setting is <blank>.

The first line of the Bootstrap Message is validated by CFUPDATE. However, no validation is performed by the Steering Routine.

For the Global Server, GLSERVER.EXE, all of the above options (none of which, with the exception of the Machine Code, are actually required) are hard-coded in the Steering Routine and consequently no external options appear.

G.3 The DIRECT ACCESS CONTROLLER section

The current structure of the "Data" key of the registry is not readily expandable. No drive-specific keys exist beneath the main "DiscreteDataFiles", "IntegratedDataFiles" and "RAMDisk" keys. The "Diskette" entry in the registry is a ValueName not a key. Within this structure any expansion can only be achieved by adding further single-level ValueNames with the drive number tagged on the end (e.g. DDF0, DDF1 etc.). Unlike the somewhat milder issues with the "Screens" and "Printers" keys (see sections G.4 and G.5) the restrictions in the current registry structure for the "Data" key cannot be avoided by performing a multi-pass analysis on the registry entries. A fundamental restructure of the registry entries beneath the "Data" key is required to allow the configuration file to be correctly emulated.

However, the registry changes described in section G.3.1 are NOT mandatory if the "UseConfigurationFile" option has been enabled. The rules described in section G.3.2 create a new format "Data" registry key from the existing settings.

G.3.1 The existing and proposed "Data" registry key structure

This section considers the structures of each of the sub-keys below the "Data" key. Only the keys and ValueNames that are pertinent to the Steering Routine are described in this document. A number of low-level, controller-specific ValueNames, which remain unaltered, are ignored in this appendix.

G.3.1.1 The "IntegratedDataFiles" key

The "IntegratedDataFiles" key currently contains the following ValueNames:

```
IntegratedDataFiles\IDF% (where % = 0 to 9)
```

An additional drive-number specific key, Drive% (where % = 0 to 9) has been added, under which a number of drive-specific ValueNames have been added:

```

IntegratedDataFiles\Drive%\+DriveDescription (where % = 0 to 9)
IntegratedDataFiles\Drive%\+VolumeFormat (where % = 0 to 9)
IntegratedDataFiles\Drive%\+UnitNumber (where % = 0 to 9)

```

Note that this registry structure enforces the rule that only a single IDF Volume Format can be associated with a single IDF drive-number.

G.3.1.2 The "DiscreteDataFiles" key

The "DiscreteDataFiles" key currently contains the following ValueNames:

DiscreteDataFiles\DDF% (where % = 0 to 9)

An additional drive-number specific key, Drive% (where % = 0 to 9) has been added, under which a number of drive-specific ValueNames have been added:

DiscreteDataFiles\Drive%\+DriveDescription (where % = 0 to 9)
 DiscreteDataFiles\Drive%\+VolumeFormat (where % = 0 to 9)
 DiscreteDataFiles\Drive%\+UnitNumber (where % = 0 to 9)
 DiscreteDataFiles\Drive%\+NumberOfSubUnits (where % = 0 to 9)
 DiscreteDataFiles\Drive%\+MaximumNumberOfFiles (where % = 0 to 9)

Note that this registry structure enforces the rule that only a single DDF Volume Format can be associated with a single DDF drive-number. Note also the need to specify both the Maximum Number of Sub-Units and the Maximum Number of Files.

G.3.1.3 The "Diskette" ValueName

The "Diskette" ValueName is a multi-value flag that can take the following values:

0 Diskette not supported
 1 - 4 Diskette supported (with various controller-specific options)

A new "Diskettes" key, in addition to a number of sub-ordinate drive-number specific keys, Drive% (where % = 0 to 9) have been added, under which a number of drive-specific ValueNames have been added:

Diskettes\Drive%\+DriveDescription (where % = 0,1; \$ = 0 to 9)
 Diskettes\Drive%\+VolumeFormat\$ (where % = 0,1; \$ = 0 to 9)
 Diskettes\Drive%\+UnitNumber\$ (where % = 0,1; \$ = 0 to 9)

Note the multiple ValueNames for the Volume Format and Unit Number settings which allow multiple diskette Volume Formats to be associated with a single Diskette drive-number.

G.3.1.4 The "RAMDisk" key

The highly-specialised "RAMDisk" key currently only contains a single controller-specific ValueName.

An additional drive-number specific key, Drive% (where % = 0 to 9) has been added, under which a number of drive-specific ValueNames have been added:

RAMDisk\Drive0\+DriveDescription
 RAMDisk\Drive0\+VolumeFormat
 RAMDisk\Drive0\+UnitNumber

Note that this registry structure enforces the rule that only a single RAMDisk controller can be specified.

G.3.2 Emulating the new "Data" registry key structure

The new registry structure is only recognised for a particular controller if the corresponding new "Drive%" key is defined in the registry:

IntegratedDataFiles\Drive% (% = 0 to 9)
 DiscreteDataFiles\Drive% (% = 0 to 9)
 Diskettes\Drive% (% = 0 or 1)

RAMDisk\Drive0

It is possible to mix the new registry structure (i.e. with a Drive% key) with the old registry structure (i.e. without a Drive% key) for different types of controllers (e.g. IntegratedDataFiles\Drive0 present but DiscreteDataFiles\Drive0 absent) but this technique is not recommended.

If a "Drive%" key is defined then all the mandatory ValueNames beneath it (see below) **must** be defined otherwise the associated controller will be dynamically removed from the configuration. It is not possible to have "hanging" Drive keys.

If a "Drive%" key is not defined then the various controller settings are emulated according to the following rules by creating internal control blocks within the Steering Routine. **The registry is never updated by this process.**

G.3.2.1 Emulation Rules for the "IntegratedDataFiles" key

The processing for the "IntegratedDataFiles" key is as follows: If the "UseConfigurationFile" option is enabled then for all drive numbers higher than 0, both the IDF% and a Drive% keys must be present in the registry. For drive 0, only the IDF% key is mandatory (i.e. only a missing Drive0 key is emulated). Note that the IDF% key is always mandatory anyway in order for the IDF controller to recognise the associated device.

If the Drive0 key is absent, a single IDF with the following parameters is emulated:

IntegratedDataFiles\Drive0\+DriveDescription	1 st Integrated
Data File	
IntegratedDataFiles\Drive0\+VolumeFormat	Z151Z
IntegratedDataFiles\Drive0\+UnitNumber	110

Only Drive0 is emulated.

G.3.2.2 Emulation Rules for the "DiscreteDataFiles" key

The processing for the "DiscreteDataFiles" key is as follows: If the "UseConfigurationFile" option is enabled then for all drive numbers higher than 1, both the DDF% and a Drive% keys must be present in the registry. For drives 0 and 1, only the DDF% key is mandatory (i.e. only a missing Drive0 or Drive1 is emulated).. Note that the DDF% key is always mandatory anyway in order for the DDF controller to recognise the associated device.

If the Drive0 key is absent, a single DDF with the following parameters is emulated if the DDF1 key is not defined:

DiscreteDataFiles\Drive0\+DriveDescription	1 st Discrete Data
File DiscreteDataFiles\Drive0\+VolumeFormat	T259Z
DiscreteDataFiles\Drive0\+UnitNumber	200
DiscreteDataFiles\Drive0\+NumberOfSubUnits	99
DiscreteDataFiles\Drive0\+MaximumNumberOfFiles	250

If the Drive0 key is absent, a single DDF with the following parameters is emulated if the DDF1 key is defined:

DiscreteDataFiles\Drive0\+DriveDescription	1 st Discrete Data
File DiscreteDataFiles\Drive0\+VolumeFormat	T259Z

DiscreteDataFiles\Drive0\+UnitNumber	200
DiscreteDataFiles\Drive0\+NumberOfSubUnits	59
DiscreteDataFiles\Drive0\+MaximumNumberOfFiles	250

If the Drive1 key is absent, a single DDF with the following parameters is emulated:

DiscreteDataFiles\Drive1\+DriveDescription	2nd Discrete Data
File DiscreteDataFiles\Drive1\+VolumeFormat	T259Z
DiscreteDataFiles\Drive1\+UnitNumber	260
DiscreteDataFiles\Drive1\+NumberOfSubUnits	39
DiscreteDataFiles\Drive1\+MaximumNumberOfFiles	250

Only Drive0 or Drive1 are emulated.

G.3.2.3 Emulation Rules for the "Diskettes" key

The processing for the "Diskettes" key is as follows: If the "UseConfigurationFile" option is enabled then for drive 1, the "Diskette" ValueName must be non-zero and the Drive1 key must be present in the registry. For drive 0, only a nonzero value for the "Diskette" ValueName is required (i.e. an absent Drive0 is emulated). Note that the "Diskette" ValueName must be nonzero anyway in order for the Diskette controller to recognise the associated device.

If the Drive0 key is absent, a single Diskette drive with the following parameters is emulated:

Diskettes\Drive0\+DriveDescription	1 st Diskette Drive (A:)
Diskettes\Drive0\+VolumeFormat0	02A
Diskettes\Drive0\+UnitNumber0	140
Diskettes\Drive0\+VolumeFormat1	02B
Diskettes\Drive0\+UnitNumber1	142
Diskettes\Drive0\+VolumeFormat2	B3B
Diskettes\Drive0\+UnitNumber2	170

Only Drive0 is emulated.

G.3.2.4 Emulation Rules for the "RAMDisk" key

The processing for the "RAMDisk" key is as follows: If the "UseConfigurationFile" option is enabled then the "RAMDisk" key must be present (i.e. a missing Drive0 is emulated). This key must be present anyway in order for the RAMDisk controller to recognise the associated device.

If the Drive0 key is absent, a single RAMDisk drive with the following parameters is emulated:

RAMDisk\Drive0\+DriveDescription	Windows NT RAM Disk
RAMDisk\Drive0\+VolumeFormat	P00A
RAMDisk\Drive0\+UnitNumber	109

Only Drive0 is emulated.

G.3.3 Validating the new "Data" registry key structure

CFUPDATE includes a considerable amount of logic to process and validate the Direct Access Devices section of the Configuration File. Most of this logic must be emulated in the Steering Routine. However, there are some important differences between CFUPDATE and the Steering Routine emulation.

The most important difference concerns the use of the ISAM Volume Types Action File, A.VTYPE. This file contains definitions of all the Volume Types that are available for inclusion in a Configuration File. The A.VTYPE Action File is architecture independent (unlike A.W0 and A.W1) to ensure portability between all the various GSM implementations. The following volume formats are hard-coded into the Steering Routine:

Volume type	Associated controller
O2A	Diskettes
O2D	Diskettes
O2B	Diskettes
B3B	Diskettes
T259Z	DDF
Z151Z	IDF
P00A	RAMDisk

NO OTHER VOLUME FORMATS CAN BE USED ON GSM (WINDOWS) CONFIGURATIONS.

The following sections describe the specific validation for each controller type.

G.3.3.1 Validating the "IntegratedDataFiles" key

No validation is performed on the +DriveDescription key. However, this string will be truncated to 25 characters. The default Drive Description is "1st Integrated Data File", "2nd Integrated Data File" etc.

The only allowed "+VolumeFormat" is Z151Z (see above).

The "+UnitNumber" must be in the range 104 to 199. The default unit for drive 0 is 110 incrementing by 1 for each drive number.

Validation is performed to ensure that the Unit Number does not clash with any other Direct Access devices.

G.3.3.2 Validating the "DiscreteDataFiles" key

No validation is performed on the +DriveDescription key. However, this string will be truncated to 25 characters. The default Drive Description is "1st Discrete Data File", "2nd Discrete Data File" etc.

The only allowed "+VolumeFormat" is T259Z (see above).

The "+UnitNumber" of the domain must be in the range 110 to 299. The default unit for drive 0 is 200. The Unit Numbers of all sub-volumes must be less than 299.

Validation is performed to ensure that the Unit Number of the domain, and all sub-volumes, do not clash with any other Direct Access devices.

The "+MaximumNumberOfFiles" must be either 99 or 250. No other values are allowed. The default is 250.

The "+NumberOfSubUnits" must be between 1 and 99. The default number of sub-volumes for Drive0 is 99, unless Drive1 is present in which case the default is 59. The default number of sub-volumes for Drive1 is 39. The default number of sub-volumes for all other drives is 29.

Important note: A further validation included in CFUPDATE is also performed by the Steering Routine: The check to limit the number of sub-volumes to between 1 and two less than the number of files in the

directory is performed. In practice this test ensures that the maximum number of sub-volumes is 97 for a 99-file per directory domain. Note that the theoretical maximum number of sub-volumes for a 250-file per directory domain (i.e. 249) exceeds the practical maximum of 99 anyway.

G.3.3.3 Validating for the "Diskettes" key

No validation is performed on the +DriveDescription key. However, this string will be truncated to 25 characters. The default Drive Description for Drive0 is "1st Diskette Drive (A:)". The default Drive Description for Drive1 is "2nd Diskette Drive (B:)".

The only allowed "+VolumeFormat" settings are 02A ,02D, 02B and B3B (see above).

The "+UnitNumber" must be in the range 104 to 199. The default units are as follows:

Volume Type	Default unit for Drive0	Default unit for Drive 1
02A	140	141
02B	142	143
02D	144	145
B3B	170	171

Validation is performed to ensure that the Unit Number does not clash with any other Direct Access devices.

Neither CFUPDATE nor the Steering Routine prevent a Volume Format from being defined more than once for a particular diskette drive.

G.3.3.4 Validating the "RAMDisk" key

No validation is performed on the +DriveDescription key. However, this string will be truncated to 25 characters. The default Drive Description is "Windows NT RAM Disk".

The only allowed "+VolumeFormat" is P00A (see above).

The "+UnitNumber" must be in the range 104 to 199. The default unit is 109.

Validation is performed to ensure that the Unit Number does not clash with any other Direct Access devices.

G.3.4 The Global Server (GLSERVER.EXE)

The general considerations described above for the "DiscreteDataFiles", "IntegratedDataFiles" and "Diskettes" keys apply to the Global Server, GLSERVER.EXE. Note that a "RAMDisk" cannot be configured on a Global Server.

Obviously, the technique of supplying an "all servers" default option in addition to a "server specific" option does NOT apply to the intrinsically server-specific Direct Access parameters.

G.4 The CONSOLE CONTROLLER section

The structure of the "Screens" key of the registry is fundamentally different from the CONSOLE CONTROLLER section of the Configuration File. The **order** of the various types of Console Controllers (i.e. GUI, NETWORK and SERIAL) in the configuration file determines the User Number allocation. However, in the registry the Screen Controller name (i.e. GUI, Network, Serial) is the primary key with the notional "console

index” as a secondary key within the controller type key.

Rather than change the hierarchy of the keys in the registry, which would involve concomitant changes to the various GSM (Windows) screen controllers, an optional “Console Index” ValueName has been defined and the Steering Routine processes the “Screens” key in three passes. The first and second passes simply build a list of screen/console definitions together with their associated Console Indexes, checking for duplicate Console Indexes. The final pass generates the required control blocks from the screen/console unit list and the various registry options.

The following options in the CONSOLE CONTROLLER section of the Configuration File have been emulated:

```
TYPE-AHEAD BUFFER LENGTH
DISPLAY BUFFER LENGTH
FUNCTION KEY BUFFER LENGTH
SCREEN IMAGE WIDTH
SCREEN IMAGE DEPTH
NUMBER OF STORED ATTR' BYTES
NUMBER OF VIRTUAL PARTITIONS
CHARACTER TRANSLATION ENABLED
CONSOLE EXECUTIVE FLAG BYTE
```

Under every Screens Controller key:

```
..\Global\Client\Screens\GUI
..\Global\Client\Screens\Serial\nn
..\Global\Client\Screens\Network\nn
```

where nn is between 00 and 99 the following settings emulate the various Console Controller options:

```
..\Global\Client\Screens\xxxxxxx\[nn]\+NumberOfPartitions
..\Global\Client\Screens\xxxxxxx\[nn]\+TypeAheadBufferLength
..\Global\Client\Screens\xxxxxxx\[nn]\+DisplayBufferLength
..\Global\Client\Screens\xxxxxxx\[nn]\+FunctionKeyBufferLength
..\Global\Client\Screens\xxxxxxx\[nn]\+ScreenImageWidth
..\Global\Client\Screens\xxxxxxx\[nn]\+ScreenImageDepth
..\Global\Client\Screens\xxxxxxx\[nn]\+NumberOfAttributeBytes
..\Global\Client\Screens\xxxxxxx\[nn]\+CharacterTranslation
..\Global\Client\Screens\xxxxxxx\[nn]\+ConsoleExecFlagByte
```

where xxxxxxxx is either “Network”, “Serial” or “GUI”.

Note the asymmetry between the “Serial” and “Network” keys, both of which require a lower-level controller-specific index number; and the “GUI” key which is not followed by a subsidiary numeric key.

In addition, the following registry setting is available to define the Screen Index Number:

```
..\Global\Client\Screens\xxxxxxx\[nn]\+ScreenIndexNumber
```

Note the difference in scope between the new, generic Screen Index Number ValueName and the existing controller-specific index number key under the “Serial” and “Network” keys. The controller-specific index number only has a scope **within** the relevant controller key (i.e. “Serial” or Network”; whereas the Screen Index Number applies to **all**

Screen controllers (i.e. “Serial”, “Network” and “GUI”). The Screen Index Number has been devised to allow total control over the order of the various Screen/Console controllers so that, for example, screens could be defined in the following order (Serial/02, Network/02, GUI, Network/01, Serial/01).

The Screen Index Number allocation is a two-pass process. In the first pass, all screens **with** an explicit +ScreenIndexNumber value are processed and allocated the relevant Index Number. Any duplicate Screen Index Numbers generate a warning dialogue box and the screen is ignored. In the second pass, all screens **without** an explicit +ScreenIndexNumber are processed and allocated the “next available” Index Number. In the second pass, the screens are considered in the following order:

```

..\Global\Client\Screens\GUI\
..\Global\Client\Screens\Network\01\
..\Global\Client\Screens\Network\02\
...
..\Global\Client\Screens\Network\99\
..\Global\Client\Screens\Serial\01\
..\Global\Client\Screens\Serial\02\
...
..\Global\Client\Screens\Serial\99\

```

For the “Network” and “Serial” controllers if any of the above “screen number specific” settings are not configured in the registry the equivalent “screen class” setting is used:

```

..\Global\Client\Screens\xxxxxxx\+NumberOfPartitions
..\Global\Client\Screens\xxxxxxx\+TypeAheadBufferLength
..\Global\Client\Screens\xxxxxxx\+DisplayBufferLength
..\Global\Client\Screens\xxxxxxx\+FunctionKeyBufferLength
..\Global\Client\Screens\xxxxxxx\+ScreenImageWidth
..\Global\Client\Screens\xxxxxxx\+ScreenImageDepth
..\Global\Client\Screens\xxxxxxx\+NumberOfAttributeBytes
..\Global\Client\Screens\xxxxxxx\+CharacterTranslation
..\Global\Client\Screens\xxxxxxx\+ConsoleExecFlagByte

```

where xxxxxxxx is either “Network” or “Serial”.

Obviously, a “screen class” +ScreenIndexNumber is meaningless.

If an option is not configured as either a “screen number specific” setting or a “screen class” setting the “generic screen” setting is used:

```

..\Global\Client\Screens\+NumberOfPartitions
..\Global\Client\Screens\+TypeAheadBufferLength
..\Global\Client\Screens\+DisplayBufferLength
..\Global\Client\Screens\+FunctionKeyBufferLength
..\Global\Client\Screens\+ScreenImageWidth
..\Global\Client\Screens\+ScreenImageDepth
..\Global\Client\Screens\+NumberOfAttributeBytes
..\Global\Client\Screens\+CharacterTranslation
..\Global\Client\Screens\+ConsoleExecFlagByte

```

Again, a generic +ScreenIndexNumber is meaningless.

If an option is not configured as either a “screen number specific” setting, a “screen class” setting or a “generic screen” setting, a

default hard-coded in the Steering Routine is used.

In addition to the above “generic screen” settings the following registry setting is available:

..\Global\Client\Screens\+MaximumPartitions

This value must be set to either 99 or 250 (the default is 99).

The +MaximumPartitions registry setting is required to emulate a relatively new feature of Global Configurator. CFUPDATE includes two upper limits for the number of screens configured. The “Maximum Number of Partitions” (i.e. equivalent to the external User Number) is calculated by simply adding all the partitions configured for each console. The “Screen Number” (an internal field that is used by the Console Executive) is calculated by multiplying the Console Number by the Maximum Number of Partitions for any one screen. An example should make this clear:

Console Number Number(s)	Partitions	User Number(s)	Screen
1	4	1,2,3,4	1,2,3,4
2	1	5	9
3	8	6,7,8,9,10,11,12,13	
17,18,19,20,21,22,23,24			

For early versions of GSM V8.1 (i.e. before GSM V8.1j) the total number of partitions (i.e. the highest User Number) must less than, or equal to, 99. For GSM V8.1j, and later, this limit has been extended to 250 for GSM (Windows) configurations. CFUPDATE displays an appropriate warning message if the configuration file exceeds the maximum User Number count.

This validation must be emulated by the Steering Routine. The +MaximumPartition setting allows the upper-limit (i.e. 99 or 250) to be specified. If this upper-limit is exceeded, a Warning Dialogue Box will appear and the number of partitions for the current screen/console will be reduced to avoid exceeding the limit. The number of partitions for all subsequent screens will be set to 0

The maximum Screen Number is hard-coded at 255 in both CFUPDATE and the Steering Routine. If this limit is exceeded, a Warning Dialogue Box will appear and the Number of Partitions for ALL screens will be set to 1.

The TYPE-AHEAD BUFFER LENGTH configuration file option is replaced by the +TypeAheadBufferLength registry setting (default 500).

The DISPLAY BUFFER LENGTH configuration file option is replaced by the +DisplayBufferLength registry setting (default 2000).

The FUNCTION KEY BUFFER LENGTH configuration file option is replaced by the +FunctionKeyBufferLength registry setting (default 0).

The SCREEN IMAGE WIDTH configuration file option is replaced by the +ScreenImageWidth registry setting (default 132).

The SCREEN IMAGE DEPTH configuration file option is replaced by the +ScreenImageDepth registry setting (default 24).

The NUMBER OF STORED ATTR' BYTES configuration file option is replaced by the +NumberOfAttributeBytes registry setting (default 1).

The NUMBER OF VIRTUAL PARTITIONS configuration file option is replaced by the +NumberOfPartitions registry setting (default 4).

The CHARACTER TRANSLATION ENABLED configuration file option is replaced by the +CharacterTranslation registry setting (default "On").

The CONSOLE EXECUTIVE FLAG BYTE configuration file option is replaced by the +ConsoleExecFlagByte registry setting (default 0).

The CONSOLE controller section has no relevance for the Global Server configuration.

G.5 The TAPE CONTROLLER section

No changes to the GSM (Windows) registry have been made to emulate the Tape Controller section of the Global Client configuration file. The various options under the following registry key:

..\Global\Client\Tape

are used privately by the Tape Controller module.

The TAPE controller section has no relevance for the Global Server configuration.

G.6 The PRINTER CONTROLLER section

The structure of the "Printers" key of the registry is fundamentally different from the PRINTER CONTROLLER section of the Configuration File. In the Configuration File the "primary key" is the Printer Unit Number (e.g. 500, 501, etc.) with the Printer Controller (i.e. DOSPRINT, WINPRINT, \$AUXPRINT) considered as a secondary option. However, in the registry the Printer Controller (i.e. DOSPrint, WinPrint, AuxPrint) is the primary key with the Unit Number (i.e. 500 to 599) as the secondary key. Rather than change the hierarchy of the keys in the registry, which would involve concomitant changes to the various GSM (Windows) printer controllers, the Steering Routine processes the "Printers" key in two passes. The first pass simply builds a list of printer units with their associated controllers checking for duplicate unit numbers in the process (i.e. duplicate Printer Unit numbers are detected at run-time). The second pass generates the required control blocks from the printer unit list and the various registry options.

The following options in the PRINTER CONTROLLER section of the Configuration File must be emulated:

HARDWARE FORMFEED
PAGE DEPTH
MAXIMUM PAGE WIDTH
TIME-OUT IN TENS OF SECONDS
SPOOLER CONTROL BITS
PRINTER EXECUTIVE FLAG BYTE
DEVICE CHARACTERISTICS

In addition, the following options in the NUCLEUS OPTIONS section of the Configuration File pertain to printers:

NUMBER OF PRINT BUFFERS
LENGTH OF PRINT BUFFERS

NUMBER OF PRINT XLATION TABLES

The Nucleus options are emulated by the following settings:

```
..\Global\Client\Printers\+NumberOfPrinterBuffers
..\Global\Client\Printers\+LengthOfPrinterBuffers
```

The default Printer Buffer Length is 250. The default number of Printer Buffers is set to the actual number of printers configured. The Printer Executive always configures a Printer Translation Table for every printer so there is no need to configure this option in the registry.

Under every Printer Controller key:

```
..\Global\Client\Printers\xxxxxxx\nnn
```

where xxxxxxxx is one of “DOSPrint”, “Winprint” or “AuxPrint” and nnn is between 500 and 599 the following settings emulate the various printer options:

```
..\Global\Client\Printers\xxxxxxx\nnn\+PrinterDescription
..\Global\Client\Printers\xxxxxxx\nnn\+HardwareFormFeed
..\Global\Client\Printers\xxxxxxx\nnn\+PageDepth
..\Global\Client\Printers\xxxxxxx\nnn\+MaximumPageWidth
..\Global\Client\Printers\xxxxxxx\nnn\+PrinterExecTimeout
..\Global\Client\Printers\xxxxxxx\nnn\+SpoolerControlBits
..\Global\Client\Printers\xxxxxxx\nnn\+PrinterExecFlagByte
..\Global\Client\Printers\xxxxxxx\nnn\+DeviceCharacteristics
..\Global\Client\Printers\xxxxxxx\nnn\+PrinterPool
```

Note that the +PrinterPool option (see below) only applies to the “DOSPrint” and “WinPrint” controllers, it does NOT apply to the “AuxPrint” controller.

If any of the above “printer number specific” settings is not configured in the registry the equivalent “printer class” setting is used:

```
..\Global\Client\Printers\xxxxxxx\+PrinterDescription
..\Global\Client\Printers\xxxxxxx\+HardwareFormFeed
..\Global\Client\Printers\xxxxxxx\+PageDepth
..\Global\Client\Printers\xxxxxxx\+MaximumPageWidth
..\Global\Client\Printers\xxxxxxx\+PrinterExecTimeout
..\Global\Client\Printers\xxxxxxx\+SpoolerControlBits
..\Global\Client\Printers\xxxxxxx\+PrinterExecFlagByte
..\Global\Client\Printers\xxxxxxx\+DeviceCharacteristics
..\Global\Client\Printers\xxxxxxx\+PrinterPool
```

Note that the +PrinterPool option (see below) only applies to the “DOSPrint” and “WinPrint” controllers, it does NOT apply to the “AuxPrint” controller.

If an option is not configured as either a “printer number specific” setting or a “printer class” setting the “generic printer” setting is used:

```
..\Global\Client\Printers\+HardwareFormFeed
..\Global\Client\Printers\+PageDepth
..\Global\Client\Printers\+MaximumPageWidth
..\Global\Client\Printers\+PrinterExecTimeout
..\Global\Client\Printers\+SpoolerControlBits
```



```

..\Global\Client\Printers\+PrinterExecFlagByte
..\Global\Client\Printers\+DeviceCharacteristics
..\Global\Client\Printers\+PrinterPool

```

Note the absence of a "generic printer" +PrinterDescription ValueName.

If an option is not configured as either a "printer number specific" setting, a "printer class" setting or a "generic printer" setting a default hard-coded in the Steering Routine is used.

The 25-character +PrinterDescription string is displayed by \$U. The default +PrinterDescription is either "DOS Printer", "Windows Printer" or "Auxiliary Printer" depending on the printer class.

The HARDWARE FORMFEED configuration file option is replaced by the +HardwareFormFeed registry setting. The PAGE DEPTH configuration file option is replaced by the +PageDepth registry setting. If the +HardwareFormFeed setting is set to "On", "Yes" etc. (the default setting) the +PageDepth setting is ignored. If the +HardwareFormFeed setting is set to "Off", "No" etc. the +PageDepth setting (default 66) is used. This processing illustrates one feature of CFUPDATE that cannot be emulated by GLREGED.EXE: The HARDWARE FORMFEED prompt is an "Auto Jump" prompt that causes CFUPDATE to avoid the PAGE DEPTH prompt if the reply is "Y".

The MAXIMUM PAGE WIDTH configuration file option is replaced by the +MaximumPageWidth registry setting (default 132).

The TIME-OUT IN TENS OF SECONDS configuration file option is replaced by the +PrinterExecTimeout registry setting (default 2). The SPOOLER CONTROL BITS configuration file setting option is replaced by the +SpoolerControlBits registry setting (default 0). Note that the value of the +SpoolerControlBits setting (i.e. 0, 1, 2 or 3) is shifted up by 6 bits and OR'ed with the +PrinterExecTimeout value, so that:

SPOOLER CONTROL BITS value	Equivalent +SpoolerControlBits setting
#00	0
#40	1
#80	2
#C0	3

The PRINTER EXECUTIVE FLAG BYTE configuration file option is replaced by the +PrinterExecFlagByte registry setting (default #FF).

The DEVICE CHARACTERISTICS configuration file option is replaced by the +DeviceCharacteristics registry setting (default 0). The +PrinterPool setting specifies the optional Printer Pool number. Note that the default value of the DEVICE CHARACTERISTICS field in the configuration file is #40, even though the #40 bit is not recognised by any of the GSM (Windows) printer controllers. However, the default value of the +DeviceCharacteristics setting is #00.

The PRINTER controller section has no relevance for the Global Server configuration.

G.7 The LAN CONTROLLER section

The LAN Controller section of the configuration file is only partly used on the GSM (Windows) architecture. Although, unlike GSM (Unix) a "true" network interface has been implemented to connect the GSM (Windows)

Global Client(s) to the Global Server(s), none of the low-level (i.e. Arcnet specific) options are required by the client-server interface. The following options in the LAN CONTROLLER section of the Global Client configuration file are all ignored:

POLLS TO WAIT BETWEEN ACCESSES
 NORMAL TIMEOUT IN SECONDS
 TIMEOUT ON 1ST ACCESS IN SECS
 LAN EXECUTIVE RETRY COUNT
 WAN MASTER NODE-ID
 LAN EXECUTIVE FLAG BYTE

The following options in the NUCLEUS CONTROLLER section of the Global Client configuration file are also ignored:

NUMBER OF FULL LAN BUFFERS
 NUMBER OF SHORT LAN BUFFERS

Similarly, the following options in the LAN CONTROLLER section of the Global Server configuration file are also ignored:

POLLS TO WAIT BETWEEN ACCESSES
 NORMAL TIMEOUT IN SECONDS
 TIMEOUT ON 1ST ACCESS IN SECS
 LAN EXECUTIVE RETRY COUNT

The following options in the NUCLEUS CONTROLLER section of the Global Server configuration file are also ignored:

NUMBER OF FULL LAN BUFFERS
 NUMBER OF SHORT LAN BUFFERS

Consequently, no changes to the GSM (Windows) registry have been made to emulate the LAN Controller section of the configuration file.

The LAN controller section has no relevance for the Global Server configuration.

G.8 The NUCLEUS OPTIONS section

The NUCLEUS SECTION of the Configuration File has the effect of establishing the various disparate fields in an internal control block.

G.8.1 Global Client (GLOBAL.EXE and GLCONS.EXE)

The following options in the NUCLEUS OPTIONS section of the Global Client configuration file have been considered:

SET BTFLAG TO #72 FOR GSM V8.1	Ignored
DYNAMIC DC/DF BLOCK ALLOCATION	Ignored
DYNAMIC LOCK TABLE ALLOCATION	Ignored
LARGEST SECTOR SIZE	Set by Steering Routine
NUMBER OF FILE CHANNELS	New registry option – see
below	
NUMBER OF FILE BUFFERS	New registry option – see
below	
NUMBER OF FILE BLOCKS	New registry option – see
below	
NUMBER OF LOCK TABLE ENTRIES	New registry option – see
below	
NUMBER OF EXTRA ASSIG\$ TABLES	New registry option – see
below	

RAM HIGH ADDRESS (KB)	Set by Steering Routine
MAXIMUM MEMORY ALLOCATION	Set by Steering Routine
RAM DISK START ADDRESS (KB)	Set by Steering Routine
CACHE BUFFER SIZE	Set by Steering Routine
CACHE START ADDRESS (KB)	Set by Steering Routine
DYNAMIC FILE BUFFER ALLOCATION	Ignored
DYNAMIC LAN BUFFER ALLOCATION	Ignored
DYNAMIC CONSOLE BUFFER ALLOCATION	Ignored
DYNAMIC CS-BLOCK ALLOCATION	Ignored
TARGET BOOTSTRAP STRATEGY	Ignored
TARGET STARTUP STRATEGY	Ignored
IS \$REMOTE SUPPORTED?	Ignored
\$REMOTE DEVICE ADDRESS	Ignored
\$REMOTE BAUD RATE	Ignored
\$REMOTE TIME-OUT	Ignored
BASIC CLOCK (MICROSECONDS) below	New registry option – see
CLOCK INTERVAL (MILLISECONDS) below	New registry option – see
SWAP INTERVAL (MILLISECONDS) below	New registry option – see
Load timer	Set by Steering Routine
Load automatic OPID/TERM	Set by Steering Routine
Load \$BYE	Set by Steering Routine
Set SYSYSM to 4 for Windows NT	Set by Steering Routine
Auto date/time sign-on see below	New registry option –

The registry settings that emulate options in the NUCLEUS OPTIONS section of the configuration file are all in the following registry keys:

- ..\Global\Client\Nucleus (see below)
- ..\Global\Client\Printers (see section G.6)

This section only considers the entries in the ..\Global\Client\Nucleus registry key. See section G.6 for the details of the entries in the ..\Global\Client\Printers registry key.

The NUMBER OF FILE CHANNELS configuration file option is replaced by the +NumberOfFileChannels registry setting. The default value is 1000.

The NUMBER OF FILE BUFFERS configuration file option is replaced by the +NumberOfFileBuffers registry setting. The default value is 10.

The NUMBER OF FILE BLOCKS configuration file option is replaced by the +NumberOfFileBlocks registry setting. The default value is 100.

The NUMBER OF LOCK TABLE ENTRIES configuration file option is replaced by the +NumberOfLockTableEntries registry setting. The default value is 100. Note also that the related +NumberOfLockSharedTableEntries registry setting (default value 2000) is also included in this section.

The NUMBER OF EXTRA ASSIG\$ TABLES configuration file option is replaced by the +NumberOfExtraASSIG\$Tables registry setting. The default value is 1. The Number of Extra ASSIG\$ Tables is held in the bottom 2 bits of the BTASSIG field (i.e. in bit-0 (#01) and bit-1 (#02)). Bit-3 (#04) is unused. Bit-4 (#08) of the BTASSIG field is a flag that indicates if the Dynamic Unit Mapping option has been enabled. The registry setting +EnableUnitMapping (default “Off”) can be used to set bit-4 (#08) of

BTASSIG.

The BASIC CLOCK (MICROSECONDS) configuration file option is replaced by the +BasicClockMicroSeconds registry setting. The default value of 100,000 **SHOULD NOT BE CHANGED**.

The CLOCK INTERVAL (MILLISECONDS) configuration file option is replaced by the +ClockIntervalMilliSeconds registry setting. The default value of 100 **SHOULD NOT BE CHANGED**.

The SWAP INTERVAL (MILLISECONDS) configuration file option is replaced by the +SwapIntervalMilliSeconds registry setting. The default value of 100 **SHOULD NOT BE CHANGED**.

The 3 “visible” Clock and Swap fields are used to calculate the “internal” Clock and Swap fields using the same algorithm as CFUPDATE.

The Auto date/time sign-on configuration file option is replaced by the +AutoDateTimeSignOn registry setting. The default option is “On”.

The new +AutoOperatorID registry setting allows the Operator-ID for the first console to be defined via the “Machine” hive of the registry (i.e. rather than the “User” hive).

G.8.1.1 File Block and File Channel validation

CFUPDATE includes logic to ensure that the NUMBER OF FILE BLOCKS is at least as high as:

$$(SQR (\text{Number of Users} * 64)) + 1$$

or the absolute value 30 (whichever is the highest). By default, the +NumberOfFileBlocks setting is not validated in the same way. However, this validation can be enabled if the +ValidateNumberOfFileBlocks registry setting is set to “On” etc.

CFUPDATE includes logic to ensure that the NUMBER OF FILE CHANNELS is at least as high as:

$$\text{Number of Users} * 8$$

or the NUMBER OF FILE BLOCKS, or the absolute value 64 (whichever is the highest). By default, the +NumberOfFileChannels setting is not validated in the same way. However, this validation can be enabled by switching the +ValidateNumberOfFileChannels registry setting to “On” etc.

G.8.2 Global Server (GLSERVER.EXE)

The registry settings that emulate options in the NUCLEUS OPTIONS section of the configuration file are all in the following registry keys:

```

..\Global\Servers\          (all servers default)
or:
..\Global\Servers\%\       (server specific)

```

(where % is the server letter between A and Z).

The server-specific option, if established, is used in preference to the “all servers” option, for the relevant server.

The NUMBER OF FILE CHANNELS configuration file option is replaced by the

+NumberOfFileChannels registry setting. The default value is 1000.

The NUMBER OF FILE BUFFERS configuration file option is replaced by the +NumberOfFileBuffers registry setting. The default value is 10.

The NUMBER OF FILE BLOCKS configuration file option is replaced by the +NumberOfFileBlocks registry setting. The default value is 100.

The NUMBER OF LOCK TABLE ENTRIES configuration file option is replaced by the +NumberOfLockTableEntries registry setting. The default value is 100. Note also that the related +NumberOfLockSharedTableEntries registry setting (default value 2000) is also included in this section..

There is no requirement to emulate the NUMBER OF EXTRA ASSIG\$ TABLES configuration file option by a combination of the +NumberOfExtraASSIG\$Tables and +EnableUnitMapping registry settings.

There is no requirement to emulate the BASIC CLOCK (MICROSECONDS) configuration file option by the +BasicClockMicroSeconds registry setting. A value of 100,000 is assumed. There is no requirement to emulate the CLOCK INTERVAL (MILLISECONDS) configuration file option by the +ClockIntervalMilliseconds registry setting. A value of 100 is assumed. There is no requirement to emulate the SWAP INTERVAL (MILLISECONDS) configuration file option by the +SwapIntervalMilliseconds registry setting. A value of 100 is assumed. The standard CFUPDATE algorithm is used to calculate the "internal" Clock and Swap fields (although these fields are not actually used at run-time by the Global Server).

There is no requirement to emulate the Auto date/time sign-on configuration file option by the +AutoDateTimeSignOn registry setting. Similarly, there is no requirement to consider an +AutoOperatorID registry setting.

Note that the strict validation of the Number of File Channels (see section G.8.1.1) is NOT performed for the Global Server. The Global Server is a "User-less" configuration so any algorithm that uses the number of screens and/or number of users is meaningless). Similarly, the strict validation of the Number of File Blocks (see section G.8.1.1) is NOT performed for the Global Server. Consequently, the +ValidateNumberOfFileChannels and +ValidateNumberOfFileBlocks registry settings do not appear in the "Servers" registry keys.

G.9 The DISTRIBUTION OPTIONS section

The following options in the DISTRIBUTION OPTIONS section of the Global Client configuration file are all ignored:

```
SOFTWARE LEVEL NUMBER
SERIAL CONSOLES ATTACHED?
PRERELEASE?
MONITOR SUFFIX
STARTER BOOTSTRAP STRATEGY
DISTRIBUTION UNIT ADDRESS
IPL UNIT ADDRESS
BACNAT format
Number of BACNAT diskettes
STARTER INSTALLATION STRATEGY
```

Consequently, no changes to the GSM (Windows) registry or GSM (Windows) Steering Routine have been made to emulate these configuration file options.

The DISTRIBUTION OPTIONS section has no relevance for the Global Server configuration.

APPENDIX H – UPGRADING GSM (WINDOWS) FROM GSM V8.11

Most of the information in this appendix has also been published in a number of White Papers on the Technology section of the Global web-site (see www.global3000.com/varworld/technolo/whitepap.html).

Important Note: This appendix contains references to some new terminology "Global Service Pack". Full details of the "Global Service Pack" concept are described in Appendix I (see below); and a White Paper published on the Global web-site.

Until the release of Global System Manager V8.11, only 2 methods were available to upgrade one revision of GSM to another. Either a complete re-installation from BACRES, BEA etc. was required (normally involving the Save/Restore Customisation option); or the \$CUSUPD process, described in section B.1, was used to upgrade without the need to reload GSM from BACRES.

The internal architecture of GSM V8.11 has been modified to make upgrades **from GSM V8.11** even easier to achieve. Such upgrades normally involve the application of a "Global Service Pack". A number of external documents have already been released describing the procedure required to modify an installed GSM V8.1k system to the V8.11 architecture. However, this appendix assumes that V8.11 is the starting point for the upgrade.

Three modifications to SYSRES have been implemented to make upgrades from GSM (Windows) V8.11 as simple as possible:

- The \$STARB customisation file has been moved out of the P.\$CMLB0 command library;
- All the stubs to Development System components have been moved out of the P.\$CMLB1 and P.\$CMLB2 command libraries;
- The option to move the customisations from within the \$MONITOR file to the Windows registry is available.

The first two modifications (i.e. the re-organisation of files and stubs within the command libraries) are automatically applied when GSM V8.11 is installed. The 3rd modification (i.e. moving the customisations from the \$MONITOR file to the Windows registry) **MUST** be implemented before attempting to apply a "Global Service Pack" for GSM. The V8.11 \$MNDISP utility includes an option to perform this modification.

Important Note: This procedure should only be attempted if the version of GLOBAL.EXE (or GLCONS.EXE) is V3.0, or later:

Run \$MNDISP. Key <CR> to the MONITOR FILE: and UNIT: prompts. After the display of the various \$MONITOR customisations, the following prompt should appear:

P to print, R for registry, <CR> to continue, <ESC> to exit:

Key R to automatically update the registry with the current \$MONITOR parameters: A new set of registry options will be automatically created. As these entries are created, a number of informative messages are displayed followed by "OK". If any of these operations fail please log the problem.

The dialogue should be similar to:

```

Global System Manager
Window Edit Functions Options Help

Global System Manager
Unit 100 aliased to

Start IPL unit      201
User File Unit     A01
Hardware node-id

P to print, R for registry, <CR> to continue, <ESC> to exit:R
Testing for Monitor key...
Creating Monitor key... OK
Adding NumberOfMemoryPages to value 57... OK
Adding SizeOfMemoryBanksKb to value 57... OK
Adding NumberOfMemoryBanks to value 0... OK
Adding SystemStackSize to value 0... OK
Adding $MONITOROverride to value On... OK
Adding CommandUnit to value 201... OK
Adding Unit100AliasedTo to value ... OK
Adding TargetSystem to value T... OK
Adding StartIPLUnit to value 201... OK
Adding UserFileUnit to value A01... OK
Adding SoftwareNodeID to value <NULL>... OK

P to print, R for registry, <CR> to continue, <ESC> to exit:_
  
```

If \$MNDISP displays the message:

```
*** Warning - $MONITOROverride registry option enabled
```

this customisation has already been applied and the R option will not be available.

Once the \$MNDISP "R" option has been used to export the customisations to the Windows registry, a GSM (Windows) V8.11 system can be upgraded by applying a GSM "Global Service Pack".

APPENDIX I – GLOBAL SYSTEM MANAGER SERVICE PACKS

Most of the information in this appendix has also been published in a number of White Papers on the Technology section of the Global web-site (see www.global3000.com/varworld/technolo/whitepap.html).

Important Note: Do not confuse the simple "GSM Service Pack" mechanism, described in this appendix, with the more sophisticated "Global Product Service Pack" mechanism described in Appendix J.

I.1 Pre-requisites

The GSM Service Pack mechanism can only be used to upgrade a pre-installed GSM or GSM-PM (Windows) V8.11 system (i.e. the configuration **must be** GSM (Windows), configuration code 5661 or 5663; the GSM revision **must be** V8.11). The GSMSP3 utility that applies GSM SP-3 checks the GSM V8.1 revision is correct (previous GSM Service Pack application jobs did not perform this check).

Furthermore, the Monitor Customisation option described in Appendix H must also be applied.

I.2 GSM Service Pack Contents

A GSM Service Pack consists of the following files:

GSMSPn.GSM	always present (where n is the SP ID)
P_\$CMLB0.GSM	normally present
P_\$CMLB1.GSM	normally present
P_\$CMLB2.GSM	normally present
P_\$CMLB3.GSM	normally present
\$MONITOR.GSM	normally present
P_\$MON.GSM	normally present
P_\$PAGES.GSM	normally present
P_\$BAPGS.GSM	normally present
P_\$SDLMO.GSM	normally present
P_\$DBG.GSM	normally present
P_\$MNMAMP.GSM	normally present

Although this list is accurate at the time of writing (i.e. for GSM Service Pack 1), other modules may be included in future GSM Service Packs. For example, GSM Service Pack 2 contains P_\$GSDLM.GSM and \$\$DLM.GSM in addition to the files listed above (actually P_\$GSDLM.GSM replaces P_\$MNMAMP.GSM).

I.3 Applying a GSM Service Pack

A GSM Service Pack is applied in 2 stages:

- Converting the GSMSPn.GSM file to the GSMSPn upgrade utility;
- Running the GSMPn utility to complete the upgrade.

I.3.1 Converting GSMSPn.GSM

The GSMSPn upgrade utility is reconstituted from GSMSPn.GSM using the \$BBS Import function. It is usually most convenient to import this utility to SYSRES. For example:

```

Global System Manager
Window Edit Functions Options Help
Global System Manager
GSM P1 READY:
GSM P1 READY:
GSM P1 READY:
GSM P1 READY:
GSM P1 READY:
GSM P1 READY:
GSM P1 READY:
GSM P1 READY:
GSM P1 READY:
GSM P1 READY:
GSM P1 READY:
GSM P1 READY:
GSM P1 READY:
GSM P1 READY:
GSM P1 READY:
GSM P1 READY:
GSM P1 READY:
GSM P1 READY:
GSM P1 READY:$BBS
Key List, Export, Import, <ESC> to exit:I
Specify MS-DOS, Windows or Unix path and filename
: \\GLOBALNT1\CDMASTER\GSM81\GSMSP1.GSM
Specify Global filename (GSMSP1 ): Unit:201 Copied
Key List, Export, Import, <ESC> to exit:I
Partition 1 Computer CA
NUM

```

Note that the directory in the above example was used during testing. The most likely location of a GSM Service Pack will be:

```
x:\GSM81SERVICEPACKn\
```

where x is the drive letter of the CD and n is the GSM Service Pack number. For example:

```
D:\GSM81SERVICEPACK1\
```

IMPORTANT NOTE: The GSMSPn upgrade utility **MUST** only be used with the "GSM Service Pack" that it was included with otherwise the results will be unpredictable. For example, GSMSP1 must only be used to apply GSM Service Pack 1; GSMSP2 must only be used to apply GSM Service Pack 2 etc. Do not use GSMSP1, for example, to apply GSM Service Pack 2.

I.3.2 Using the GSMSPn upgrade utility

The GSMSPn upgrade utility is used to copy the various *.GSM files to either SYSRES or SYSIPL (depending on the actual configuration and the contents of the Service Pack). The following steps are required:

1. Ensure the GSM Monitor Customisation has been applied as described in Appendix H. Note that if \$MNDISP is used to export the \$MONITOR customisations to the registry then **GSM (Windows) must be reloaded in order for GSMSPn to recognise the change;**
2. Ensure you have a recent backup of SYSRES (and SYSIPL if the Global Client does not load from a local SYSRES);

3. Ensure you are the only user running Global System Manager (you will be required to reload GSM immediately after applying the upgrade);
4. Run the GSMSPn upgrade utility. The dialogue will be similar to:

```

Global System Manager
Window Edit Functions Options Help
Global System Manager
GSM P1 READY:
GSM P1 READY:
GSM P1 READY:
GSM P1 READY:
GSM P1 READY:
GSM P1 READY:
GSM P1 READY:
GSM P1 READY:GSMSP1

Apply GSM V8.11 Service Pack 1

Please ensure that you have read Appendix H from the
GSM V8.11 notes before continuing.

GSM-PM (Windows) loads directly from SYSRES
Key <CR> if this is deduction is correct, or <ESC> otherwise:

You are about to upgrade your SYSRES
Key <CR> to continue only if you have a recent backup:

Specify the Windows directory that contains the *.GSM upgrade files
:\\GLOBALNT1\\CDMASTER\\GSM81
Upgrade in progress...
Upgrade complete, now reload Global System Manager:_
  
```

Note that the directory in the above example was used during testing. The most likely location of a GSM Service Pack will be:

```
x:\GSM81SERVICEPACKn\
```

where x is the drive letter of the CD and n is the GSM Service Pack number. For example:

```
D:\GSM81SERVICEPACK1\
```

5. If the information regarding the load from SYSRES/SYSIPL is incorrect about the upgrade immediately and log the problem with the Hotline;
6. Specify the directory that contains all the various *.GSM Service Pack files;
7. When the upgrade completes, reload Global System Manager and run \$S to confirm that the upgrade has been applied correctly. The GSM Service Pack number will be shown in the version number displayed by \$S (e.g. 8.1.1 indicates GSM Service Pack 1 has been applied; 8.1.2 indicates GSM Service Pack 2 has been applied etc.):

```

Global System Manager
Window Edit Functions Options Help
Global System Manager
GSM PM V8.1.1   Revision 1   Serial      1   29/09/2000 15.21.41
Run-Time       Level 9      Maximum number of users 9999
Configuration  566SYN      Windows NT
BACNAT variant 3.1
Architecture   W (Windows) Machine family code   W1 (01)
GSM nucleus    4 (Windows NT)
Language code   UK

Computer CA Master computer A
User 1 - partition 1

      3 screens ( 11 partitions)
      11 memory banks available
      no disk cacheing
55296 bytes user area #001C12 to #00F412
      100 ms clock frequency
      100 ms time slice

      631 Kb of      31590 Kb of available memory in use
      993 Kb of      9000 Kb of available 32-bit memory in use

System stack    0 bytes,      0 free

Key P to print, <CR> to continue, <ESC> to exit:_
Partition 1 Computer CA
NUM

```

I.4 Trouble-shooting problems with GSMSPn

The most likely cause of an unexpected JOB MANAGEMENT TERMINATED message from GSMSPn is insufficient spare space on the SYSRES volume. The Job Dialogue generated by GSMSPn can be displayed by keying <CTRL A> to either of the prompts that start with the text "Key <CR> ...".

If GSMSPn fails, the recommended recovery procedure is to restore SYSRES from the backup copy and increase the size of the free space to 4Mb.

APPENDIX J – GLOBAL PRODUCT SERVICE PACKS

Important Note: Do not confuse the sophisticated "Global Product Service Pack" mechanism described in this appendix with the "GSM Service Pack" mechanism described in Appendix I.

Global Product Service Packs are fully described in document **updating32bitapps.doc**.

APPENDIX K – GLOBAL E-COMMERCE USERS

For GSM SP-3 the Global user licencing policy has been extended by the introduction of E-commerce Users and E-commerce Frames. It is now possible to extend the total number of Global users on a GSM (Windows) configuration by the addition of an E-commerce user upgrade. Thus, a GSM (Windows) configuration can include both Standard Users and E-commerce Users. Whereas Standard Users can run any Global application, E-commerce Users can only run special E-commerce Frames. An imminent release of Global 3000 V5.0 will include a new Global 3000 E-commerce Module containing a number of E-commerce Frames.

Global E-commerce users are only supported on the following combination of GSM components:

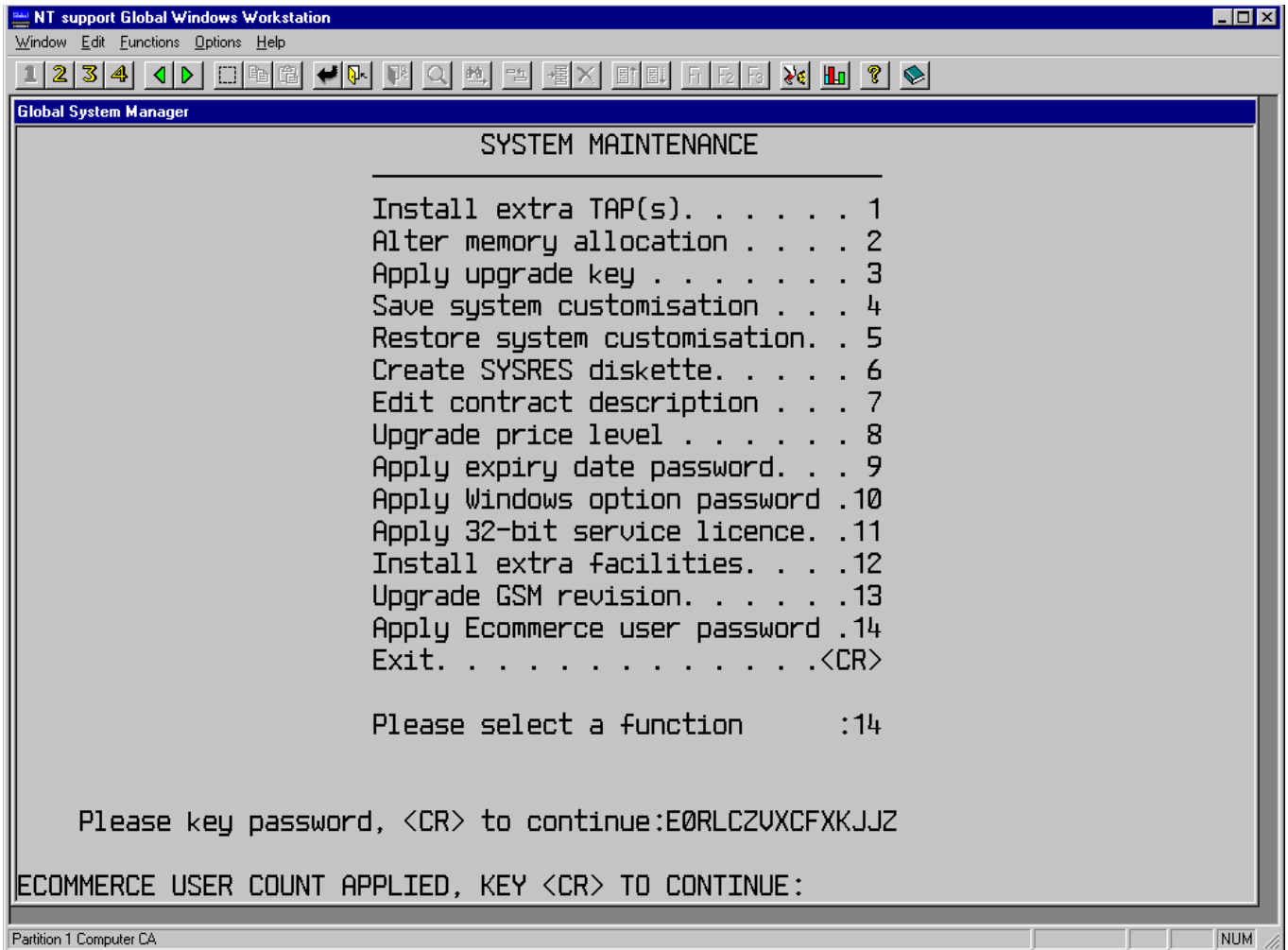
- GSM (Windows);
- GSM V8.11 SP-3, or later;
- GLOBAL.EXE V3.2, or later;
- GX.EXE V2.2, or later.

K.1 Applying an E-commerce User Upgrade

The E-Commerce User upgrade is applied using the \$CUS, System Maintenance, Apply E-commerce User Password option.

A Global E-commerce password always consists of an "E", followed by a single digit, followed by 13 upper-case letters. The passwords are distributed within Global Licence Files. For example:

```
* Licence file created on 03/06/2001 at 09.12.25 by ALAN
0001
121212
1234567HSNUPS
**Global E-commerce licence is E0RLCZVXCFXKJJZ
```



Global System Manager must be reloaded for the customisation to take effect. The results of the customisation will be displayed by \$\$. For example:

```

NT support Global Windows Workstation
Window Edit Functions Options Help
1 2 3 4 < > [Icons]
Global System Manager
GSM PM $10.34 Revision | Serial 1 INT 20/02/2001 15.10.50
Run-Time Level 9 Maximum number of users 9010
Configuration 566SYN Windows NT
BACNAT variant 3.2
Architecture W (Windows) Machine family code W1 (01)
GSM nucleus 4 (Windows NT)
Language code DUT
Standard users 9000 Ecommerce users 10
Computer CA Master computer A
User 10 - partition 1

6 screens ( 29 partitions)
29 memory banks available
no disk cacheing
55296 bytes user area #082252 to #08FA52
100 ms clock frequency
100 ms time slice

1657 Kb of 14703 Kb of available memory in use
1452 Kb of 64000 Kb of available 32-bit memory in use

System stack 0 bytes, 0 free
CAPS NUM

```

In this somewhat artificial example (from an internal, test version of GSM, hence the odd version number) the 8th line down contains the number of Standard Users and E-commerce Users. Note the "Maximum number of users" on the 2nd line contains the sum of the Standard User count and the E-commerce User count.

K.2 Adding the Extra User to the GSM (Windows) Configuration

The customisation described in section K.1 merely re-licences GSM. The extra users must be added by conventional means.

If the option to by-pass the Global configuration file has been selected (see Appendix G) then the new users are simply added by including extra settings in the "Network" controller section of the registry (using GLREGED.EXE). No further changes are required.

If the option to by-pass the Global configuration file has **NOT** been selected then a combination of CFUPDATE and GLREGED.EXE must be used to add the extra users. Firstly, the new users are added to the registry by using GLREGED.EXE to include extra settings in the "Network" controller section. Secondly, CFUPDATE must be used to upgrade the Global Configuration File on SYSRES (or SYSIPL).

If the version of P.CF is earlier than GSM SP-4, the following error message will be displayed and the configuration file updated will be aborted:

```
NUMBER OF SCREENS HIGHER THAN ALLOWED MAXIMUM
```

If the version of P.CF is GSM SP-4, or later, the above error message

will still appear but the configuration file update is allowed to proceed.

Important note: The GSM SP-5 version of the P.CF library is distributed as \$BBS file P_CF.GSM in the gsm81servicepack5 directory. Although, the P.CF file is not installed by the GSMSP5 installation job, it can be copied to the CFPROG unit (or SYSRES, if CFUPDATE is installed onto SYSRES) using the \$BBS Import function. The following points are pertinent:

- the GSM SP-4 version of the P.CF library is **not** distributed in the gsm81servicepack4 directory, since this has been superceded by GSM SP-5;
- no changes to CFUPDATE itself are required, only the P.CF library has changed;
- all installed copies of CFUPDATE will operate correctly with the GSM SP-5 version of the P.CF library;
- the GSM SP-5 version of P.CF can be used with all earlier GSM Service Packs.

K.3 Configuring GX for an E-commerce User

As explained in the V2.2 Global Application Explorer (GX) INI File Settings Notes (GX22INIFILE.DOC) the following setting in the [hosts] section of the GXHOSTS.INI file enables a GX connection for an E-commerce User:

Ecomm	(single host)
EcommN	(multiple hosts)

Set this setting to "On" etc. to identify an E-commerce User; set this setting to "Off" (or exclude it from the GXHOSTS.INI file) to identify a Standard User.

K.4 User Checking at Sign-On

The GSM policing invoked when a user signs in has been extended to perform the following checks:

- The number of Standard Users is not exceeded;
- The number of E-Commerce User is not exceeded.

If the number of Standard Users is exceeded the following dialogue box will be displayed:



If the number of E-commerce Users is exceeded the following dialogue box will be displayed:



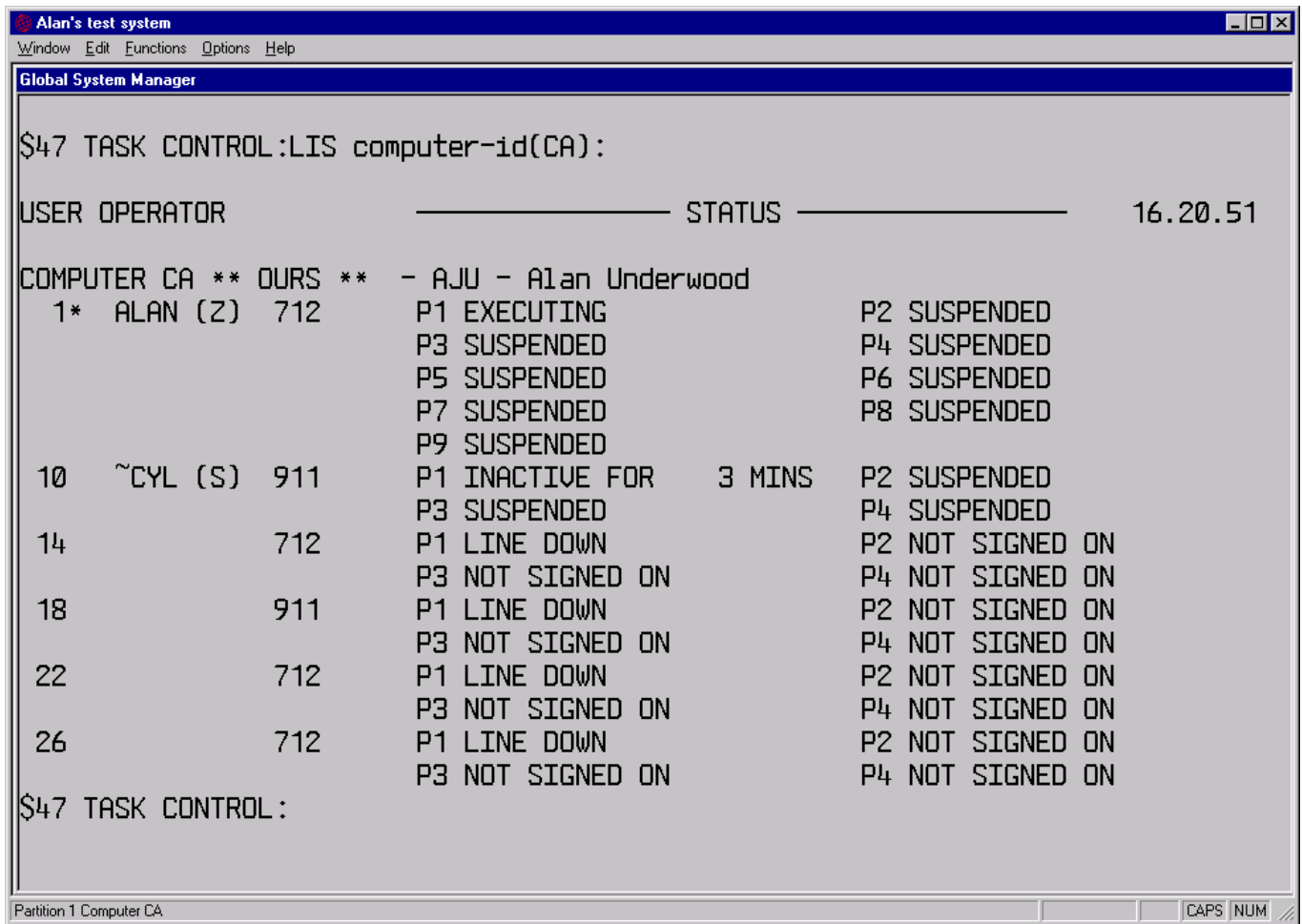
Other warning messages are possible but generally indicate that some internal error has occurred or that that GSM has been tampered with. **Please quote the Initiation Warning number when reporting problems in this area.**

K.5 E-commerce pseudo Operator ID's

When the GX Ecomm option is selected the option to specify the Operator ID and Password is **not** available. The actual Operator-ID is synthesized by GSM because it is expected that the initial E-commerce Frame will contain its own user validation and password checking (as is the case with Global 3000 E-commerce module).

A unique Operator-ID, consisting of the "~" character followed by 3 letters is synthesized by GSM, for all the E-commerce users. However, **all E-commerce Operator-ID's are mapped to the special Operator-ID of "~~~~" for the purposes of \$AUTH and \$PASSWD** - it is expected that all E-commerce Users will start with the same initial program or initial menu. Thus, it is only necessary to establish the \$AUTH/\$PASSWD settings for the **single** Operator-ID "~~~~" to specify these settings for **all** the E-commerce users.

The following example from \$STATUS shows both a Standard User and a synthesized E-commerce User:



K.6 E-commerce Run-Time Policing

As explained, above E-commerce Users are only licenced to run E-commerce Frames. The following error message will be displayed if an E-commerce user attempts to run a "normal" Speedbase program:

