

Global Operating Manual Windows NT Version 8.1

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TABLE OF CONTENTS

Section Description	Page Number
1. Introduction	6
1.1 What is Global System Manager?	6
1.2 An Overview of Global System Manager	7
1.3 Global System Manager on Windows NT: An Operational Overview.....	8
1.4 Global System Manager on Windows NT: A Technical Overview.....	10
1.5 Global System Manager (Windows NT) Version and Variant Numbers .	10
2. Installing Global System Manager	12
2.1 Installing Global System Manager	12
2.2 Using SETUP.EXE to Install From the BACNAT Diskettes.....	14
2.3 Installing Global System Manager on the Master Server.....	26
2.4 Errors During Installation.....	30
2.5 Checking Your New System.....	31
2.6 Installing Other Global Software (\$INSOFT)	32
2.7 Global System Manager Backup and Reinstallation	33
2.8 Installing Additional Global Clients	35
2.9 Upgrading Global System Manager (Windows NT)	36
2.10 Using Windows Uninstall to Remove Global System Manager	3
3. Running Global System Manager	39
3.1 Starting Global System Manager	39
3.2 Global System Manager Client Start-Up	42
3.3 Global System Manager.....	44
3.4 The Main Menu and Ready Prompt	44
3.5 Concurrent Screen Handling.....	45
3.6 Terminating Global System Manager	46
4. Additional Utilities	47
4.1 \$BYE - Terminate Global System Manager	47
4.2 \$CUS - Modify Installed Global System Manager	48
4.3 \$E and \$END - Operator Sign Off	49
4.4 \$REMOTE - Non-networked File Transfer Utility	50
4.5 \$REORG - Reorganise/Reallocate Data File Sub-volumes	50
4.6 \$S - Obtain System Information	52
4.7 \$STATUS - Control Multi-User Configuration	52
4.8 \$TDUMP - Tape Backup/Restore Utility	53
4.9 \$U - Display/Print Unit Information	53
4.10 \$V - Volume Maintenance Utility	5
5. The Graphical User Interface (GUI)	63
5.1 GUI Overview	63
5.2 Global System Manager Customisation	63
5.3 Using the Graphical User Interface (GUI)	64
6. Windows Utilities	73
6.1 Contents of the BACNAT Media	73
6.2 Starting Global Utilities Under Windows NT and Windows 95.....	74
6.3 GLOBAL.EXE - Start a single Global Client	76
6.4 GLSERVER.EXE - Start a single Global Server	76
6.5 GLSSTART.EXE - (Re)Start multiple Global Servers.....	77
6.6 GLDFMAIN.EXE - Global Data File Maintenance Utility.....	78
6.7 Installation Batch Files.....	80
7. Global Registry Editor	81
7.1 An Overview of the Windows Registry	81
7.2 GLREGED.EXE - The Global Registry Editor	82
7.3 GLREGED Operations.....	84

8. Global Client Configuration	91
8.1 Machine Name and Bootstrap Messages	91
8.2 Data File Definition.....	92
8.3 User Display Attributes.....	100
8.4 Tape Controller.....	105
8.5 Printer Attributes.....	106
8.6 Transport Layer.....	111
8.7 Nucleus Options.....	113
8.8 Distribution Options.....	113
8.9 Miscellaneous Registry Settings	114
9. Global Server Configuration	116
9.1 Machine Name and Bootstrap Messages	116
9.2 Data File Definition.....	116
9.3 User Display Attributes.....	125
9.4 Tape Controller.....	125
9.5 Printer Attributes.....	126
9.6 Transport Layer.....	126
9.7 Nucleus Options.....	127
9.8 Distribution Options.....	128
9.9 Miscellaneous Registry Settings	128

APPENDICES

Appendix	Description	Page
A	Installation Notes.....	130
B	Installation Error and Warning Messages	138
C	Pop-Up Error Messages	149
D	Windows Files and Directories	157
E	Global Registry Definition	160
F	GUI Registry Options	167
G	Trouble-Shooting Guide	176
H	Standard Configurations	199
I	SVC-70 Interface	204
J	Server Network Parameters Worksheet	207
K	Global .INI File Options	208
L	Graph Template File Structure	210
M	GUI Program Control	219
N	System Requests	221

1. Introduction and Overview

This manual is a user's guide to Global System Manager for Windows NT. It should be read in conjunction with the Global System Manager Manual and the Global Configuration Notes.

In this manual we describe the implementation of Global System Manager on Windows NT together with those aspects of Global System Manager that are specific to Windows NT.

Global System Manager is responsible for running the Global range of application software.

This chapter explains what Global System Manager is, and briefly describes the facilities that it offers.

1.1 What is Global System Manager?

In order to run on a particular computer, a computer program must be able to receive data from, and send it to, the computer's peripheral devices: screen and keyboard, disk drives, printers etc.

For example, the program has to interpret what the operator types at the keyboard and display the appropriate characters on the screen. Similarly, it has to be able to 'read' data files on a disk, process the data, and output it to the screen or printer.

People recognised early on in the development of computers that it was neither necessary, nor efficient, for every program, designed to run on a particular computer, to duplicate these 'housekeeping' routines. Reading a file of sales figures or a word processing document are identical operations at the hardware level.

Accordingly, operating systems were developed. These are sophisticated computer programs which are loaded first into the memory of a computer, and which provide an environment for other programs - applications which perform actual tasks - to run in. The application programs contain only task-specific routines, and call on the resources of the operating system when they need to perform common, low-level operations, such as reading from a disk.

As the computer industry developed, manufacturers began to produce ranges of computers, each available in a variety of configurations: that is to say, with various combinations of peripherals. A standard model could be bought with varying amounts of memory, one or many screens, different printers and different disk options. Operating systems had to be developed which could handle different configurations of the same computer, or of a range of computers from the same manufacturer.

Global System Manager represents the next stage of development. Standard operating systems are specific to computers from a particular manufacturer or, at best, to different makes of computer built around the same processor type. Because non-Global application programs are designed to run under a particular operating system, they cannot usually be transferred from one computer to another. If you want to move on to another make of computer (because you needed a bigger or better machine) you have to scrap your current applications, usually together with all your accumulated data.

Global System Manager, on the other hand, has been designed from the outset to be portable across a wide range of computers, processor types and operating systems.

This means that a company running Global applications can progress from, say, a single-user microcomputer from one manufacturer to a more powerful multi-user minicomputer from another, or to a mixed network of personal or departmental computers. Data files are easily transferred from the old machine to the new, and because Global applications run identically on different computers, so are staff skills.

Standard operating systems have another disadvantage. Their origins lie either in mainframe computing, which is oriented towards very large organizations with specialist data processing departments, or (in the case of early microprocessor operating systems) in the hobbyist market. In both cases, the consequence is complexity and user-unfriendliness.

Global System Manager, in contrast, is targeted towards small to medium-sized organizations running business applications on a wide range of equipment, but which will not normally have their own specialist data processing staff. Global System Manager can be installed, modified and run by staff with a minimum of training because, although it offers sophisticated facilities, these are presented to the user in a simple and clear fashion. All screen dialogue uses ordinary English terms in preference to jargon, and the more complex operations can be made invisible to those who use the system on a daily basis. Extensive on-screen help facilities are available at every point, and (we hope) the manuals are concise but clear when you need to use them.

1.2 An Overview of Global System Manager

So far, we have described Global System Manager in the most general terms. Let's now examine what Global System Manager does in a little more detail. This can be broken down into four main areas: hardware set-up, controlling operator access, running application programs, and providing system utilities.

1.2.1 Hardware set-up - the bootstrap process

When you switch your computer on, initially it is just an empty machine. There may be programs and data held on the hard disk, and various other peripherals attached, but the computer's memory and processor are empty and thus the machine cannot access them. By performing the bootstrap process (sometimes this involves putting a diskette into one of the drives), you cause the operating system to be loaded into memory. Once the Windows NT operating system has been loaded you can run Global System Manager (see Chapters 2 and 3).

Global System Manager utilises a true Client-Server architecture. The Global Server processes are started on one, or more, server computers. Once the Global Servers are "listening" for network requests, the Global applications (via a Global Client can be run on any workstation on the network).

The Global Client start-up process consists of two main stages:

- Global System Manager loads those parts of itself, so-called 'resident' routines, which stay in memory as long as the Global

Client session lasts. These enable the Global Client to control peripheral devices and load the non-resident elements (such as Global System Manager utilities which the operator may ask to run intermittently) when required.

- Next, Global System Manager allocates some of the computer's memory for use as buffers and memory banks.

Buffers are areas of memory used as temporary stores for data being moved from one peripheral to another.

Memory banks, or partitions, are areas of memory into which application programs or utilities are loaded in order to be executed. Depending on how much memory is available, Global System Manager can allocate up to nine partitions for each screen attached to the workstation, thus allowing each operator to run up to nine programs concurrently.

1.2.2 Controlling operator access - the sign-on process

The whole process of loading Global System Manager, although internally very complex, takes only a few seconds on most computers and is wholly invisible to the user. The first sight the user has of Global System Manager is when the Splash Screen and Main Menu are displayed. This menu lists the application programs installed on the computer, and you can select a particular application, such as Global Payroll, by simply pointing and clicking using the mouse. Alternatively, menu items may be selected by keying the appropriate number on the keyboard.

Under some exceptional circumstances (described later in this manual) the first sight the user has of Global System Manager **may** be when asked for confirmation that the date and time it has obtained from Windows NT are correct. Once confirmed, the date and time information is held internally by Global System Manager. Global System Manager can, in turn, pass the date and time on to application programs and utilities which may need to display them or print them in reports.

Under other exceptional circumstances (also described later in this manual) Global System Manager **may** ask the user of each screen for an operator-id: This too is held internally by Global System Manager and may be passed on to applications and utilities, but its main importance lies in the fact that it can be used to control access to the computer and hence to your data. You can set up a table of authorized users, with associated passwords and authorization levels. Global System Manager will ensure that only these operators can access programs and data. You can also get Global System Manager to direct specified users to particular menus.

Under other exceptional circumstances (also described later in this manual) Global System Manager **may** ask the user for their terminal type: A number (between one and four digits) which tells Global System Manager what type of screen and keyboard is being used. Global System Manager can then interpret input from that keyboard, and format any displays to the size of the screen.

Operator details are held in the User File. The contents of this file can be inspected using the \$STATUS command. It also serves as the basis for message passing between different users.

1.3 Global System Manager on Windows NT An Operational Overview

Global System Manager provides Windows NT with the ability to run the Global range of software and hundreds of industry-specific packages. These applications are designed for serious business use, and utilise a simple yet powerful system of menus, clear English commands and a consistent user interface to ensure maximum productivity.

The main features provided by Global System Manager are described in the following sections.

1.3.1 Password and authorisation

Multi-level password and authorisation checking guard against unauthorised access to the system as a whole, to individual modules or to sensitive functions within modules. Individual operators can be directed to particular functions at startup or to personalised menus of their own.

1.3.2 Security

You can set up a table of authorised users, each with their own operator code and password which are checked whenever they run Global System Manager. Use of individual menu entries can be restricted to operators with certain authorisation codes. Data files can also be password protected, and can either be private or accessible by all users.

Security copies of data and programs can be created on diskettes or tapes, either manually or under job control.

1.3.3 The Menu Handler

Global System Manager introduces a powerful yet easy to use menu handler to Windows NT.

System menus are automatically updated as new modules are installed, and can be customised to suit each installation. Menu entries can be protected by passwords, and can include a pre-defined sequence of keystrokes to drive the application program. Operators can be restricted to certain functions, or directed to particular submenus.

1.3.4 Graphical User Interface (GUI) and Virtual screen facility

Each user can be configured to use up to nine virtual screens from which they can run up to nine concurrent Global applications, with the ability to switch between each screen at will. By default, the Global virtual screens are presented using a Graphical User Interface (GUI) look-and-feel.

1.3.5 Multi-User via serial screens

In addition to running as a "GUI application" with true Windows "look-and-feel" on a window on the integral screen, Global System Manager includes the unique ability to run exactly the same application code on industry-standard serial screens (e.g. Wyse-60). Thus providing the ability to transform a normally single-user Windows NT workstation into a multi-user terminal server using cost-effective serial terminals.

1.3.6 Global utilities

Global System Manager acts as a common resource manager for modules that run under it, providing an extensive set of utilities, windowing and pop-up facilities. Global utilities include a powerful print spooler, message passing between screens, and system customisation programs. Pop-up windows provide on-screen calculator and calendar, data transfer between tasks and a standard help system.

Global applications use a common data file format across the whole range of operating systems upon which they run. This enables data transfer between a whole range of different computers and operating systems (e.g. Novell, SCO Unix, AIX, HP-UX etc.). Global System Manager provides a comprehensive set of file management utilities which allow Global files to be created, modified, inspected, repaired and deleted.

1.3.7 System requests

A powerful set of 'system requests' can be invoked at any time with a minimum of keystrokes. These include:

- On-screen calculator able to feed back results into the application program;
- Calendar - shows a month at a time on the screen and can return a selected date to the application program;
- Help - displays help windows to the current application;
- Print - prints the current screen contents;

Important note: A number of System Requests are inappropriate, or operate in a restricted manner, when used in conjunction with the GUI sub-system.

1.3.8 The Global Cobol interpreter

The Global Cobol interpreter has been implemented on Windows NT. This allows any programs written in Global Cobol to be run on Windows NT. Each user executes a copy of the Global Cobol interpreter to run their Global applications.

1.3.9 The Global Spooler

Global System Manager provides a sophisticated yet user friendly spooler which allows printers to be shared by all users, with features such as priority sequencing, multiple copies and line-up patterns for pre-printed forms. The spooler can run as a background task, and can be controlled from any screen.

1.3.10 The Global Mailing System

Global System Manager provides a user friendly electronic mail facility which allows operators to send mail messages to each other and take telephone messages electronically.

1.3.11 A file import and export utility

A batch file import and export utility, FILECONV, is available which converts data and text files to (and from) the Global data format. This facility allows Global applications to interface to other Windows NT applications.

1.4 Global System Manager on Windows NT: A Technical Overview

The implementation of Global System Manager on Windows NT involves the following:

- The Global Servers are initiated in the standard manner (see Chapter 6 for further details of the options available to initiate programs on Windows NT);
- Each Server is allocated a unique Global System Manager Node-id (i.e. an upper-case letter "A" to "Z");
- Global System Manager does not access the hard disk directly, the Global System Manager domain is simulated inside a collection of Windows NT files. Thus, instead of accessing the sectors of a physical disk, Global System Manager accesses the records of a Windows NT file. These 'disks-within-a-file' are referred to as simulated volumes;
- Once the Global Servers have been initiated, the Global Clients can be started. The Global Client hosts Global System Manager and all the Global applications.

1.5 Global System Manager (Windows NT) Version & Variant Numbers

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

1.5.1 Global System Manager (Windows NT) GSM Versions

The highest level in the Global System Manager (Windows NT) software hierarchy consists of the Global System Manager "\$ programs" (e.g. \$F) and related files (e.g. \$MONITOR). The version of this software layer is referred to as the "Global System Manager version" (e.g. V8.1). This version number is displayed on the first line of the \$S report (see Chapter 5 of the Global System Manager Manual).

The Global System Manager version number is also displayed by the About/Global System Manager option from the Help menu.

1.5.2 Global System Manager (Windows NT) Executive Versions

The next level in the software hierarchy consists of the executives. For Global System Manager (Windows NT) Client configurations the executive library (i.e. +.W0) is empty because the code for the executives is included within the BACNAT software (see section 1.5.4). Thus, the version of the executive library, which is meaningless, is not displayed by \$S.

1.5.3 Global System Manager (Windows NT) Controller Variants

The controllers represent the next level in the software hierarchy. For Global System Manager (Windows NT) Client configurations the controller library (i.e. +.W1) is empty because the code for the controllers is included within the BACNAT software (see section 1.5.4). Thus, the variant of the controller library, which is meaningless, is not displayed by \$S.

1.5.4 Global System Manager (Windows NT) BACNAT Variants

The BACNAT software (i.e. "native" software: Windows NT programs and text files etc.) represents the lowest level in the software hierarchy. Because both the executives (see section 1.5.2) and controllers (see section 1.5.3) are contained within the BACNAT software, the BACNAT variant number is the crucial parameter when describing the Global System Manager software revision.

The BACNAT variant number is displayed by the About/Global Client option from the Help menu on the main Global Client window. This variant number consists of two parts:

Global Client Vn.n
Global Windows Workstation Vn.n

The BACNAT variant is also displayed by the About option from the Help menu on the Global Server window; and by the \$S utility (see Chapter 5 of the Global System Manager Manual).

2. Installing Global System Manager

This chapter describes how to install Global System Manager and other Global software onto your computer. The purpose of installation is to copy the software you want to use for day-to-day running.

The installation process involves using the distribution diskettes, with which you have been supplied, to create hard disk volumes containing the installed software. The distribution diskettes should then be kept in a safe place so that they can be used to reinstall the software if this should ever become necessary.

THIS CHAPTER (ESPECIALLY SECTION 2.3) SHOULD BE READ IN CONJUNCTION WITH APPENDIX A.

To prevent this chapter from becoming too unwieldy, only a simple standard installation is documented. Appendix H, which should be read in conjunction with this chapter, fully describes all the common Global System Manager (Windows NT) installations. Section G.33 describes a potentially useful non-standard installation.

2.1 Installing Global System Manager

You must install Global System Manager and (optionally) Speedbase Presentation Manager before installing any other Global software.

There are many possible Global System Manager (Windows NT) network configurations. Only the simplest (and recommended) configuration is described in this chapter. Appendix H fully describes all the common installations.

The standard Global System Manager (Windows NT) network configuration consists of a single Global Server computer, which acts as the Global System Manager "Master Server", and a number of Global System Manager Clients. The Global System Manager "Master Server" is usually a Windows NT server. The Global System Manager Clients are usually Windows NT workstations or Windows 95 computers.

THE GLOBAL SYSTEM MANAGER (WINDOWS NT) MASTER SERVER MUST HAVE A NODE-ID OF "A" (I.E. THE DEFAULT).

In the standard, single file-server configuration, all Global System Manager system files, Global application programs and data, are held on the Master Server. The various Global System Manager workstations access these files over the network. A small Integrated Data File Discrete Logical Volume (DLV), GL-IPL.DLV, is created which is used on workstations to load Global System Manager.

Although it is possible for several computers to share files directly under Windows NT, this must never be attempted with Global System Manager volumes. **Any attempts to share Global System Manager volumes will result in severe corruption of the Global System Manager data files.** Server Discrete Data File Domains (e.g. GSMA00) must only be accessed directly by a Global Server: Other workstations, running the Global Client, must access it indirectly, via the relevant Global Server. Local Discrete Data File Domains (e.g. GSM200) and local Integrated Data File DLV's (e.g. GL-IPL.DLV) must only be accessed by a single Global Client.

2.1.1 The Distribution Diskettes

Global System Manager together with Speedbase Presentation Manager are always distributed on high-capacity 1.4Mb 3½" diskettes. Please consult your Global Configuration Notes for further information. The diskettes will be labelled as follows:

BACNATn	Unlike some other implementations of Global System Manager where only a single BACNAT diskette is required (e.g. Global System Manager (MS-DOS) and Global System Manager (Novell NetWare)), several BACNAT diskettes (normally 2) are distributed with Global System Manager (Windows NT) configurations;
BACRES	Global System Manager starter system (1 st diskette). The BACRES diskette contains Global System Manager startup data;
BEA diskette);	Global System Manager starter system (1 st extension
HAA diskette);	Global System Manager starter system (2 nd extension
EPA	Speedbase Presentation Manager installation diskette (only present for Global System Manager PM configurations);
CFA	Global Configurator installation diskette (not required during the installation of Global System Manager). See the Global Configurator Manual for further details.

THE GLOBAL FORMAT DISTRIBUTION DISKETTES ARE UPDATED DURING THE INSTALLATION PROCESS, AND THEREFORE MUST NOT BE WRITE-PROTECTED.

2.1.2 Installation Overview

The installation of Global System Manager on Windows NT is a multi-stage process. All stages must be completed according to the instructions in this chapter otherwise attempts to load from the installed Global System Manager will fail unpredictably.

2.1.2.1 Master Server BACNAT installation

The first stage (described in section 2.2) involves using the SETUP.EXE utility to install the BACNAT components from the BACNAT diskette set.

Important note-1: Unlike some other Global System Manager configurations (e.g. Global System Manager (MS-DOS) or Global System Manager (Novell)) this stage automatically sets up the environment (i.e. creates the required directories and allocates the required files).

Important note-2: Unlike some other Global System Manager configurations (e.g. Global System Manager (Unix)) this stage (which only involves directory allocation, file creation and Registry updating etc.) DOES NOT automatically load the Global System Manager Starter System from BACRES.

2.1.2.2 Master Server BACRES installation

The second stage involves loading Global System Manager from the BACRES distribution diskette and installing Global System Manager on

the Master Server using the installation dialogue as described in section 2.3. This **"Server installation"** (sic) creates the **SYSIPL volume (Windows file GL-IPL.DLV)** that will be used subsequently by all those **Global System Manager (Windows NT) Clients** that have not been installed with a **Local SYSRES**. Note that the Global System Manager (Windows NT) Servers load from a pre-configured SYSIPL file (i.e. GL-x-IPL.DLV, where x is the Server node-id) that is derived from a template file extracted from the BACNAT media.

At the end of this stage, a single Client-Server pair will be installed on a single computer.

The two main installation stages (i.e. installation from BACNAT using the SETUP utility; and installation from BACRES, using the standard, generic Global System Manager installation dialogue) are followed by a number of post-installation phases.

2.1.2.3 Installing extra Clients

The first post-installation stage (described in section 2.8) involves using the SETUP.EXE utility to install the Global Client software on other computers on the network. This stage is followed by a further stage, which is dependent on the options selected during the Global Client installation.

2.1.2.3.1 Installing extra Clients (without a Local SYSRES)

After the generic Global Client installation (described in section 2.8.1) the workstation SYSIPL file (i.e. GL-IPL.DLV) must be copied from the Master Server to all the Global Client workstations on the network. Note that this stage (which is described in section 2.8.2.1) is not required for single computer configurations or if ALL Global Clients are configured with a Local SYSRES; but is mandatory for all Global Clients that have been configured without a local SYSRES.

2.1.2.3.2 Installing extra Clients (with a Local SYSRES)

A final optional post-installation stage (described in section 2.8.1) involves loading Global System Manager from the BACRES distribution diskette and installing local copies of Global System Manager Client on individual workstations. Note that this stage (which is described in section 2.8.2.2) is only required for those Global Clients that have been configured with a local SYSRES.

2.1.2.4 Installing extra Servers

The installation of extra Global Servers is fully described in Appendix H.

2.2 Using SETUP.EXE to install from the BACNAT diskettes

This section describes how the SETUP utility is used to perform the first stage of the Global System Manager installation process.

2.2.1 Introduction to SETUP.EXE

SETUP.EXE is a standard Windows Setup utility that uses the InstallShield Wizard to control the installation of Global System Manager Servers and Clients on Windows NT configurations. SETUP performs all the necessary steps required for a successful installation, including creating files and directories, creating Registry entries, creating icons and copying executables and pre-configured files from the BACNAT media.

SETUP controls the installation of both Global Servers and Global Clients.

2.2.1.1 Navigating within SETUP

SETUP presents a series of Dialogue Boxes that prompt for specific information and require responses to certain decisions and selections. Each Dialogue Box usually has buttons and an edit field into which information can be supplied. The term "focus" is important in this context since the object that has the focus is the one that will respond to user actions. For example, if a text-string is to be supplied, the text edit field must have the focus. Similarly, if a button representing a decision needs to be selected it needs to have the focus. These objects are termed "Controls" and throughout the rest of this chapter will be referred to as Edit Controls or Button Controls. An Edit Control has the focus if it has a blinking cursor within it. A Button Control can be recognised as having the focus when its text is surrounded by a dashed rectangle. Key <TAB> to transfer the focus within the controls in a Dialogue Box. Alternatively, using the mouse to click on a control transfers the focus to that Dialogue Box control.

At the bottom of most Dialogue Boxes there are three Button Controls: BACK, NEXT and CANCEL. Selecting the BACK button returns to the previous Dialogue Box. This button is disabled in some Dialogue Boxes if the previous Dialogue Box cannot be accessed for some reason. Selecting NEXT confirms the choice or entry and proceeds to the next Dialogue Box in the SETUP utility. Selecting CANCEL aborts the installation process immediately.

Important note: The CANCEL option must be used with extreme caution because any apparently "completed" installations performed during the current SETUP session will be cancelled as well as the "cancelled" installation. For example, if SETUP has been used to install a Global Server during the same session as a cancelled Global Client installation, **BOTH** the Server and the Client installations will be cancelled.

2.2.2 Starting SETUP

SETUP can be run directly from the BACNAT diskettes, or from a work directory on the hard disk. The next section describes the steps required to run SETUP directly from diskette. The following section describes the pre-SETUP steps required to run from a work directory on the hard-disk.

2.2.2.1 Running SETUP from the BACNAT diskettes

Perform the following steps to run SETUP:

1. Insert the first BACNAT diskette in the lowest numbered diskette driver (normally drive A:);
2. SETUP can be started by a number of methods:
 - 2a. From the command prompt in an MS-DOS box. Type:

```
A:\SETUP.EXE
```
 - 2b. From File Manager or Windows Explorer. Display the contents of drive A: and then click on SETUP.EXE;

2c. At the Run command in Windows NT V3.51 Program Manager.
Type:

A:\SETUP.EXE

2d. From the Windows NT V4.0 or Windows 95 desktop using the Start/Run option. Type:

A:\SETUP.EXE

3. A number of initial windows will appear while SETUP is performing various initialisation procedures. These windows consist of progress indicators that describe the status of the file expansion, file copying and "housekeeping" routines (e.g. preparing the InstallShield Wizard). The files on the BACNAT media are expanded and copied to a work directory on the hard-disk.

SETUP will prompt for other diskettes as required. Place the correctly labelled disk in the drive and key <CR>. Once the initialisation has completed, SETUP displays the initial "Welcome" screen. Click on NEXT or key <CR> to proceed to the next Dialogue Box that allows the Program Folder to be selected.

2.2.2.2 Running SETUP from the hard-disk

If SETUP is to be used more than once on a particular computer it may be more convenient to copy the contents of the BACNAT diskettes to an "Install Directory" on the hard-disk. Use an appropriate Windows command to create a fresh directory (e.g. C:\GSMINST) and copy all the files from ALL the supplied BACNAT diskettes into that directory.

Similarly, if SETUP is to be used more than once on a particular network it may be more convenient to copy the contents of the BACNAT diskettes to an "Install Directory" on a server hard-disk. **For most installations, you are recommended to copy the contents of the BACNAT media to an Install Directory on a server.**

Start SETUP by running SETUP.EXE from the Install Directory (e.g. C:\GSMINST\SETUP.EXE) using one of the techniques described in step 2 of section 2.2.2.1. Proceed with the installation as described in step 3 of section 2.2.2.1.

2.2.2.3 Choose Installation Option Dialogue Box

When the SETUP initialisation has completed, a Dialogue Box with the caption "Choose Installation Option" will appear. Use this Dialogue Box to select either a "Standard Installation" or an "Advanced Installation".

The Standard Installation option installs only the icons for the Global Server and Global Client programs. The icons for the "advanced" GLREGED.EXE (see Chapter 7) and GLDFMAIN.EXE (see section 6.6) utilities are not installed during a Standard Installation. Both GLREGED.EXE and GLDFMAIN.EXE are considered administrative tools and, as such, are deemed inappropriate for normal operators. However, both GLREGED.EXE and GLDFMAIN.EXE are both copied from the BACNAT media to the Global directory during a Standard Installation (so are available for use by administrative users).

The Advanced Installation option installs standard icons for both GLREGED.EXE and GLDFMAIN.EXE in addition to the Global Client and Global Server icons.

The remaining installation dialogue is the same for the Standard Installation and the Advanced Installation.

2.2.2.4 Select Program Folder Dialogue Box

When the Installation Option has been selected, a Dialogue Box with the caption "Select Program Folder" will appear. The name of the Global System Manager Program Folder must be supplied. During installation all the Global System Manager icons will be placed in the Global System Manager Program Folder.

In addition to the Edit Box, the Dialogue Box includes a List Box which contains a list of existing folders.

If a suitable Program Folder already exists it can be selected from the List Box. Alternatively, the name of a new folder can be entered in the Edit box. The new folder will be created automatically during the installation.

Once the folder name has been supplied, SETUP will proceed to the next Dialogue Box.

2.2.2.5 Installation Type Dialogue Box

This Dialogue Box allows either a Server installation or Client installation to be performed. **When performing a standard installation you are STRONGLY recommended to perform the Global System Manager Server installation followed by the Global System Manager Client installation.** At the end of the Server installation the Installation Type Dialogue Box will be redisplayed allowing you to perform a Client installation immediately afterwards (i.e. both a Server installation and a Client installation can be performed within a single invocation of SETUP).

Use the mouse to click on the installation option (e.g. "Global server" or "Global client") required. Alternatively, use the keyboard <UP-ARROW>, <DOWN-ARROW>, <LEFT-ARROW> or <RIGHT-ARROW> keys to select the required option.

Select NEXT to proceed to the next Dialogue Box.

The rest of the dialogue will depend whether you are installing a Global Server or a Global Client. Section 2.2.3 describes the installation of a Global Server. Section 2.2.4 describes the installation of a Global Client.

For a standard installation you are STRONGLY advised to install a single Server, followed immediately by a single Client before loading Global System Manager from BACRES. Although it is possible to install a Server, quit SETUP.EXE, load from BACRES, then re-run SETUP to install the Client, such a procedure is not recommended.

2.2.3 Using SETUP to Install a Global System Manager Server

This section describes the installation of a Global System Manager Server.

2.2.3.1 Server node-id Dialogue Box

Every Global System Manager Server must have a unique node-id. The Server node-id MUST be a single upper-case letter (i.e. "A" to "Z"). However, for convenience, if the reply is a lower-case letter it is automatically converted to upper-case. The node-id of the Global System Manager "master" Server MUST be "A".

Select the required node-id then proceed to the next Dialogue Box. If the Server has already been installed the next Dialogue Box will be the "Select Upgrade Types" Dialogue Box (see section 2.7.3). If a new Server node-id has been specified the "Select Installation Directory" Dialogue Box (see section 2.2.3.2) will appear next.

2.2.3.2 Select Installation Directory Dialogue Box

The various files needed to run Global System Manager must be placed in a unique directory. A default directory is displayed under the heading Destination Directory.

If the default directory is selected, it will be automatically created (if necessary).

2.2.3.2.1 Installation Directory Browse Dialogue Box

If the default directory is inappropriate another directory can be specified. Place the focus on BROWSE and click on it. The "Choose Directory" Dialogue Box will appear. Enter the pathname of the required directory into the Edit Box and click on the OK button to proceed to the next Dialogue Box.

If the directory you explicitly specify does not exist a warning pop-up will appear allowing you to create it.

When the Choose Directory Dialogue Box has closed, you will be returned to the "Select Installation Directory Dialogue Box" (see section 2.2.3.2).

2.2.3.3 Select DDF Directory Dialogue Box

The various Global files used by a Global Server are held within a Discrete Data File (DDF) Domain directory (see section 9.2.1). Normally this is a sub-directory of the installation directory with standard naming convention (see section 9.2.1.1). A default directory, with the appropriate node-id, is displayed under the heading "Destination Directory".

If the default directory is selected, it will be automatically created (if necessary).

2.2.3.3.1 DDF Directory Browse Dialogue Box

If the default directory is inappropriate another directory can be specified. Place the focus on BROWSE and click on it. The "Choose Directory" Dialogue Box will appear. Enter the pathname of the required directory into the Edit Box and click on the OK button to proceed.

If the directory you explicitly specify does not exist a warning pop-up will appear allowing you to create it.

When the Choose Directory Dialogue Box has closed, you will be returned to the "Select DDF Directory Dialogue Box" (see section 2.2.3.3).

2.2.3.4 Network Parameters Dialogue Boxes

Two Dialogue Boxes will appear that allow the various network parameters to be specified. **These parameters are always required even for non-networked, single-computer configurations.**

The Network parameters for the Server should be noted - they will be required during subsequent Client installations (see section 2.2.4.9.1 and 2.2.4.9.3. The worksheet in Appendix J can be used to note the various parameters specified for each Global Server.

2.2.3.4.1 Network Parameters (Select Protocol Sequence)

The requests to a Global System Manager Server from a Global System Manager Client are routed via a particular network protocol. **THIS PROTOCOL SEQUENCE MUST SPECIFY A PROTOCOL SUPPORTED BY ALL CLIENTS REQUIRING ACCESS TO THE SERVER.**

The Global System Manager Setup procedure does not offer a default. The protocol **MUST** be selected from the following list:

`ncalrpc` Networking Computing Architecture using local communications only (Local Windows NT communications). This interface can only be used for simple, single-computer configurations where the Global System Manager Client and Server are on the same computer. **THIS INTERFACE IS RECOMMENDED FOR SINGLE COMPUTER CONFIGURATIONS BECAUSE IT PROVIDES THE BEST CLIENT-SERVER PERFORMANCE.**

Important note: If you select this interface for a simple, single-computer configuration then upgrade to a network configuration you **MUST** amend both the Server and Client Registry settings to select a valid network protocol. For example, change "ncalrpc" to "ncacn_ip_tcp" on all Global Servers and all Global Clients;

`ncacn_ip_tcp` Networking Computer Architecture connection over an Internet Protocol with a Transmission Control Protocol for transport (Connection Protocol Sequence i.e. TCP/IP). **THIS INTERFACE IS RECOMMENDED FOR NETWORK CONFIGURATIONS;**

`ncacn_spx` Networking Computing Architecture connection using SPX (Connection oriented SPX);

`ncacn_np` Networking Computing Architecture connection using named pipes (Named pipes);

`ncadg_ip_udp` Networking Computer Architecture connection over an Internet Protocol with a User Datagram Protocol for transport (Datagram Protocol Sequence);

`ncacn_nb_tcp` Networking Computer Architecture connection using NetBIOS over TCP/IP (NetBIOS over TCP/IP);

`ncacn_nb_nb` Networking Computer Architecture connection using NetBIOS over the NetBEUI transport (NetBIOS over NetBEUI);

ncadg_ipx Networking Computing Architecture datagram over an IPX protocol with a User Datagram Protocol for transport on (Datagram oriented IPX).

If an invalid protocol is entered a warning Message Box will appear listing all the valid protocols.

An apology: Due to a restriction in the InstallShield Wizard it is not possible to display the list of allowed protocols while the Select Protocol Sequence Edit Box is displayed.

For convenience, the following short-hand (easy to remember and simple to key) names are allowed for the most commonly used, and recommended, protocols:

TCP equivalent to "ncacn_ip_tcp"
 SPX equivalent to "ncacn_spx"
 LOC equivalent to "ncalrpc"

For example, for a single computer configuration specify a Network Protocol of "LOC" (the double-quotes are not required when you edit the Edit Box).

2.2.3.4.2 Network Parameters (Select Endpoint)

Each Global System Manager Server waits for requests from Global System Manager Clients using the Network Protocol defined in section 2.2.3.4.1. The Network Protocol must be able to handle multiple requests to multiple servers. To achieve this multiplicity accesses are sub-divided using Endpoints. **EACH ENDPOINT SPECIFIED FOR EVERY GLOBAL SYSTEM MANAGER SERVER MUST BE UNIQUE AND MUST NOT INTERFERE WITH ANY OTHER SOFTWARE RUNNING ON THE NETWORK.**

The format of the Endpoint parameter depends on the protocol sequence:

Protocol	Endpoint
LOC or ncalrpc	Free format (not 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

The following Endpoint numbering convention for the ncacn_ip_tcp protocol is recommended:

Node-id	Endpoint	Node-id	Endpoint	Node-id	Endpoint
A	3000	J	3009	S	3018
B	3001	K	3010	T	3019
C	3002	L	3011	U	3020
D	3003	M	3012	V	3021
E	3004	N	3013	W	3022
F	3005	O	3014	X	3023
G	3006	P	3015	Y	3024
H	3007	Q	3016	Z	3025
I	3008	R	3017		

2.2.3.5 Global Master Node-id Dialogue Box

A Global System Manager network MUST have one, and only one, Server designated as the Global System Manager "master". If SETUP cannot detect that a master node has been specified the "Global Master Node-id Dialogue Box" will appear. The Master Server node-id MUST be a single upper-case letter (i.e. "A" to "Z"). However, for convenience, if the reply is a lower-case letter it is automatically converted to upper-case.

For all standard installations, the node-id of the Global System Manager "master" Server MUST be "A".

The master node-id is the last parameter required for the Master installation. When the master node-id has been supplied, SETUP will create the required directories, copy the Global 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 nascent Global System Manager Program Group will be displayed, illustrating the icons that have been installed. You may have to close this window or return the focus to the SETUP utility in order to continue.

2.2.3.6 Installation Type Dialogue Box

When the Server installation has completed successfully, the Installation Type Dialogue Box is redisplayed (see section 2.2.2.3). Note that this Dialogue Box differs slightly from the one described in section 2.2.2.3; three options (rather than two) are offered:

Global Server Install another Global System Manager Server (see section 2.2.3.1). If you plan to install multiple Servers (e.g. "B", "C", "D" etc. in addition to the Server "A" that you have just installed) you are advised to install ALL the Servers before commencing with the first Client installation. The "all Servers before first Client" rule is strongly recommended because you will be required to specify the details of all the available Servers during the course of the subsequent Client installation(s);

Global Client Install a Global System Manager Client (see section 2.2.4);

Exit installation Quit the SETUP program. Note that this option does NOT automatically initiate the next stage of the Global System Manager installation procedure (see section 2.3).

2.2.4 Using SETUP to Install a Global System Manager Client

This section describes the installation of a Global System Manager Client. The precise Client installation dialogue depends on two factors:

- if the Client installation is being performed immediately after a Server installation (i.e. within the same invocation of SETUP);

- if the Client installation is being performed on a computer that already contains an installed Global System Manager Server.

Thus, the following Client installation pathways are possible:

- Client installation immediately following a Server installation within the same invocation of SETUP. This is the default case, which is initiated by selecting the "Global Client" option from the Dialogue Box described in section 2.2.3.6;
- Fresh Client installation without a previous Server installation on the computer (see section 2.8.1);
- Additive Client installation on a computer that includes a Global System Manager Server. Running SETUP.EXE twice on a particular computer (i.e. initially to install a Global Server, then subsequently to install a Global Client) can cause problems if the Uninstall utility (see section 2.10) is used to remove Global System Manager. Consequently, **THIS PROCEDURE IS NOT RECOMMENDED AND IS NOT DOCUMENTED;**
- Fresh Client installation which will be immediately followed a Server installation within the same invocation of SETUP. **THIS PROCEDURE IS NOT RECOMMENDED AND IS NOT DOCUMENTED.**

The rest of this section describes the Global Client installation following a previous Global Server installation within the same invocation of SETUP.

2.2.4.1 Client node-id Dialogue Box

Every Global System Manager Client must have a unique node-id. The Client node-id **MUST** be either a decimal number between 27 and 255, excluding 192; or a hexadecimal number between 0x1b and 0xff, excluding 0xc0.

Important note: Unlike some other Global System Manager configurations it is **NOT** possible to specify a single upper-case letter (usually "B" to "Z") for a Client node-id. For Global System Manager (Windows NT) there is a very strict demarcation between Client and Server node-ids:

Server node-id's: Single upper-case letter "A" to "Z" only;

Client node-id's: Number between 27 (0x1b) and 255 (0xff), excluding 192 (0xc0), only.

Select the required node-id to proceed to the next Dialogue Box.

2.2.4.2 Client Operator-id Dialogue Box

To avoid the necessity of supplying your operator-id every time you initiate the Global System Manager Client, the operator-id can be specified once at this point during Client installation. You are **STRONGLY** advised to supply your operator-id now.

Enter your operator-id, a code up to 4 characters in length, then proceed to the next Dialogue Box. If the Edit Box is left blank, you will be prompted for an operator-id every time you load Global System Manager.

Note that a "Client Terminal Type Dialogue Box" does NOT appear. A Terminal Type of 711 is assumed (see section 8.3.1.2.2).

2.2.4.3 Select Installation Directory Dialogue Box

The various files needed to run Global System Manager must be placed in a unique directory. A default directory is displayed under the heading Destination Directory. The default directory is the one selected during the Server installation (see section 2.2.3.2) - **YOU ARE STRONGLY ADVISED TO SELECT THE DEFAULT TO INSTALL THE GLOBAL CLIENT INTO THE SAME DIRECTORY AS THE GLOBAL SERVER.**

If the default directory is selected, it will be automatically created (if necessary).

2.2.4.3.1 Installation Directory Browse Dialogue Box

If the default directory is inappropriate another directory can be specified. Place the focus on BROWSE and click on it. The "Choose Directory" Dialogue Box will appear. Enter the pathname of the required directory into the Edit Box and click on the OK button to proceed to the next Dialogue Box.

If the directory you explicitly specify does not exist a warning pop-up will appear allowing you to create it.

When the Choose Directory Dialogue Box has closed, you will be returned to the "Select Installation Directory Dialogue Box" (see section 2.2.3.2).

2.2.4.4 Local SYSRES Installation Dialogue Box

The standard installation (i.e. WITHOUT a "Local SYSRES" for each Client) requires each Global System Manager Client to be loaded from an IPL DLV created during the Global System Manager Server (sic) installation (see section 2.3). Furthermore, the "Shared SYSRES" used by the Clients will be accessed indirectly, via the Master Server.

The installation of a local SYSRES is fully described in Appendix H.

For a standard-installation, with a Shared SYSRES accessed via the Master Server, select "No" to proceed to the next Dialogue Box.

2.2.4.5 Shared SYSRES, Local DDF Installation Dialogue Box

If you have declined the option for a Local SYSRES (see section 2.2.4.1.4) it is still possible to access a local, private Discrete Data Domain for this Client.

Important note: Unlike some other Global System Manager configurations there is no peer-to-peer networking between Clients on Global System Manager (Windows NT) configurations. A local Client DDF can only be accessed by a single Client.

For a standard-installation, without a Local DDF, select "No". The InstallShield Wizard will create the necessary Registry entries before continuing with the Dialogue Box described in section 2.2.4.1.7.

2.2.4.6 Select DDF Directory Dialogue Box

This Dialogue Box will only appear if you have chosen to install a Local DDF (see section 2.2.4.1.6).

The various Global files by a Global System Manager Client are held within a Discrete Data File (DDF) Domain directory (see section

8.2.1). Normally this is a sub-directory of the installation directory with standard naming convention (see section 8.2.1.1). A default directory is displayed under the heading Destination Directory.

If the default directory is selected, it will be automatically created (if necessary).

2.2.4.6.1 DDF Directory Browse Dialogue Box

If the default directory is inappropriate another directory can be specified. Place the focus on BROWSE and click on it. The "Choose Directory" Dialogue Box will appear. Enter the pathname of the required directory into the Edit Box and click on the OK button to proceed to the next Dialogue Box.

If the directory you explicitly specify does not exist a warning pop-up will appear allowing you to create it.

When the Choose Directory Dialogue Box has closed, you will be returned to the "Select Installation Directory Dialogue Box" (see section 2.2.4.1.6).

2.2.4.7 Client-Server Information Box

An Information Box describing the next phase of the Client installation will appear. Select OK when have read and understood the instructions in this Information Box.

In order for a Global Client to communicate with a Global Server several parameters describing the location and identity of the Server process must be supplied.

The following sequence of prompts request information required by the Global Client to locate a Global Server on the network. **The protocol sequence and endpoint values must match those configured for the relevant Server when it was installed.** The network address must be determined from the network software settings on the computer running the relevant Global System Manager Server.

The following sequence of parameters **MUST** be repeated for each installed Server that is to be accessed by the current Client.

2.2.4.8 Server Node-id Dialogue Box

Supply the node-id of a Global System Manager Server (i.e. a single upper-case letter - although a lower-case reply is automatically converted to upper-case). A Global System Manager Client must be connected to at least one Server: For all Client installations the network parameters for Server "A" **MUST** be specified. If you have installed multiple Servers, it is most convenient to specify the parameters for all the Servers at this stage in the Client installation dialogue.

Specify the Server node-id to proceed to the next Dialogue Box. A reply of space will exit the "Server information loop" and complete the Client installation.

Important note: If you key the wrong Server node-id by mistake, use the <BACK> button to return to this Dialogue Box. Box.

2.2.4.9 Server Network Parameters Dialogue Boxes

The next three Dialogue Boxes refer to the Global System Manager server specified in the Server Node-id Dialogue Box (e.g. "A", "B")

etc.) - see section 2.2.4.1.8. These Dialogue Boxes allow the various network parameters to be specified. **These parameters are always required even for non-networked, single-computer configurations.**

Throughout sections 2.2.4.1.9.1 to 2.2.4.1.9.3, the Server specified here will be referred to as the "Target Server".

2.2.4.9.1 Network Parameters (Protocol Sequence) Dialogue Box

The requests from a Global System Manager Client to a Global System Manager Server are routed via a particular network protocol. **THIS PROTOCOL SEQUENCE MUST SPECIFY THE SAME PROTOCOL THAT WAS SELECTED WHEN INSTALLING THE TARGET SERVER (SEE SECTION 2.2.3.4.1).**

The Global System Manager Setup procedure does not offer a default. The protocol **MUST** be selected from the list described in section 2.2.3.4.1.

2.2.4.9.2 Network Parameters (Network Address) Dialogue Box

The Network Address of the computer that will be running the Target Server must be specified. Note that the format of the Network Address will depend on the network protocol defined for the Client-Server link. The format of the Network Address parameter depends on the protocol sequence:

Protocol	Address format
LOC or ncalrpc	None. Always blank;
TCP or ncacn_ip_tcp	Dotted decimal (e.g. 255.192.64.24) or computer name if defined in the "hosts" file;
SPX or ncacn_spx	20 digit hexadecimal address prefixed by a tilde character. The first 8 hex characters specify the 4-byte network number, the remaining 12 hex characters specify the 6-byte IPX/SPX internetwork address;
ncacn_np	Server name;
ncadg_ip_udp	Dotted decimal (e.g. 255.192.64.24) or computer name if defined in the "hosts" file;
ncacn_nb_tcp	Server name;
ncacn_nb_nb	Server name;
ncadg_ipx	20 digit hexadecimal address prefixed by a tilde character. The first 8 hex characters specify the 4-byte network number, the remaining 12 hex characters specify the 6-byte IPX internetwork address;

If the Target Server process is running on the same computer as the current Client, the Network Address parameter can be left blank.

Important Note: Although the Network Address of the Target Server must be specified when installing the Client, the Network Address of the Server is not required during the Server installation (i.e. the Global Server process can determine dynamically the Network Address of the computer it is running on). This difference between Global Server and

Global Client installation only applies to the "Network Address": The "Network Protocol" and "Endpoint" parameters must be specified for both the Global Server and Global Client phases of the installation.

2.2.4.9.3 Network Parameters (Endpoint) Dialogue Box

The Global System Manager Client sends requests to the Target Server using the Network Protocol defined in section 2.2.3.4.1. The Network Protocol must be able to handle multiple requests to multiple servers so its accesses are sub-divided using Endpoints.

THIS ENDPOINT MUST BE THE SAME THAT WAS SELECTED WHEN INSTALLING THE TARGET SERVER (SEE SECTION 2.2.3.4.2).

See section 2.2.3.4.2 for the recommended Endpoint numbering convention for the `ncacn_ip_tcp` protocol.

2.2.4.10 Client - Server Connections Decision Box

Once the various network parameters that fully define the Target Server have been specified, a Decision Box describing all the Global System Manager Servers that have been defined for the current Client will appear. You are given the option to "Attach to another Global Server" (i.e. define the network parameters for another Global Server) or "Continue Installation" (i.e. to complete the final stages of the installation process).

Select the "Attach to another Global Server" option to return to the Dialogue Box described in section 2.2.4.8 that allows you to specify the next "Target Server".

Select the "Continue Installation" option to complete the Client-to-Server definition phase of the Client installation.

SETUP completes the installation, creating the required directories and Registry entries, and constructing the Program Group and icons. Information message boxes will be displayed to indicate the progress of these activities.

The nascent Global System Manager Program Group will be displayed, illustrating the icons that have been installed. You may have to close this window or return the focus to the SETUP utility in order to continue (e.g. using the Windows <ALT><TAB> feature).

2.2.4.11 Installation Complete - Information Box

Once SETUP has completed the final phase of the Client installation an Information Box will appear. Select the "OK" option to terminate the installation. Note that because only one Global Client can be installed on a particular computer (and because the Client installation should be conducted after any Server installation(s)) SETUP does not return to the Installation Type Dialogue Box described in section 2.2.3.6 after a successful Client installation.

2.3 Install Global System Manager - Master Server

This stage is a "traditional" Global System Manager installation from BACRES, BEA etc. In addition to creating the "master SYSRES" volume that will be accessed via the Master Server, it also creates the SYSIPL volume that will be used to load all Clients that have been configured, or will be configured, without a local SYSRES.

2.3.1 Loading the Starter System

Begin the installation process by loading the simple starter system supplied on the distribution diskettes, commencing with the first system diskette which is labelled BACRES. The name of the diskette appears in the top right hand corner of the label.

Insert the BACRES diskette into diskette drive A: and load the Global System Manager installation system by running the GLINSSRV.BAT batch file from the Global directory.

Important note: The "Install Global System Manager on Master Server" batch file, GLINSSRV.BAT, is deliberately NOT iconised. This function will only be used once per installation - creating an icon to perform this essentially administrative task would clutter up the desktop environment for normal operators.

The computer will access the diskette for approximately 10 seconds and then the Global System Manager Splash Screen will appear. After another small delay the Splash Screen will be replaced by a window containing the standard sign-on screen.

Do not be disturbed by the WARNING messages that may appear when loading Global System Manager from the distribution diskettes or tape. They indicate that Global System Manager has re-configured itself dynamically to match your computer set-up more closely. The messages are suppressed once Global System Manager has been installed.

2.3.2 The Serial Number Prompt

When you load the starter system for the first time you may get a prompt of the form:

```
Please key serial number (number and letters):
```

You must key in the serial number which appears in the middle of the label on the BACRES diskette. You may then be prompted for details such as the name of the company that supplied you with your Global System Manager and the address of the site where it will be used. When you have keyed these in, the following prompt will appear:

```
Key line number to amend, or A to accept:
```

Check what you have keyed carefully, and if there are any errors key in the corresponding line number to change that line. When all the lines are correct, key A to continue. Note that if you make a mistake after accepting the changes, you can apply up to 10 further amendments using the \$CUS System Maintenance option (see Chapter 6 of the Global System Manager Manual).

2.3.3 The Installation Process

The starter system runs the installation program automatically when you load Global System Manager. This program displays a sequence of explanatory text and prompts to determine precisely how you want Global System Manager installed. If you cannot understand a particular prompt, check its reference in the section of Appendix A which explains what you need to do in more detail. Each prompt is prefixed by a reference to Appendix A. For example, [A.17] refers to section 17 of Appendix A.

2.3.4 The Installation Itself

Once you have replied to the first set of prompts, Global System Manager is installed from the distribution diskettes. Section 2.4

describes problems that can arise during this process and suggests recovery actions. The installation process creates a unit on the Discrete Data File Domain called SYSRES and an Integrated Data File DLV called SYSIPL. Note that the creation of the SYSIPL volume is automatic.

The installation may create more than just the SYSRES data volume. Optionally, a spool unit (SPOOL), a work unit (SYWORK), a log unit (SYSLOG) and a mail unit (SYSML) may be created during installation.

Once the software has been installed, there are further prompts allowing you to customise Global System Manager. For example, you must select the date format you want to use and the type of printer. Again, these prompts are explained more fully in Appendix A.

It is possible to quit the installation in order to run utility commands (e.g. \$S, \$U, \$F, \$V) in order to check the new system **BEFORE** installing onto the hard disk. To quit the installation, reply Q to the following prompt:

Key <CR> to continue:

To continue with the installation, provided no unit assignments have been altered, key INSGSM to the GSM READY: prompt.

To abort Global System Manager without installing, run the \$BYE utility from the P.MIN library. For example:

```
GSM READY:P.MIN
V8.1 MINIMUM SYSTEM LIBRARY
GSM READY:*BYE
```

Note the use of both the "*" to "\$" aliasing, necessary to run the \$BYE command (typed as *BYE) from the \$P unit; and the library index load (of P.MIN) prior to running the command program. See Appendix F of the Global Utilities Manual for further details.

2.3.5 Restoring the Existing Customisation

As explained in Appendix A (sections A.40 and A.42) when installing Global System Manager V8.1 you are given the option of saving the customisation from an existing SYSRES. If you select this option, a copy of the existing SYSRES will be copied to the BACSAV sub-volume before Global System Manager is installed, overwriting the existing SYSRES. Once the installation has completed you are given the option of restoring the existing customisation.

If this option is selected, the following files (if present) are copied from the BACSAV sub-volume to the newly installed SYSRES:

\$\$Pnnn	V8.1 printer control files
\$\$RSxxxx	Screen reset sequence files
\$\$FKxxxx	V8.1 Function key definition files
\$\$TRxxxx	V8.1 input key translation files
\$txxxxxx	\$TAPE catalogue files
\$\$DRxxxx	\$DIRP personal menu selection files
\$\$SCxxxx	Screen specific sequence files
\$.xxxxxx	Global System Manager TAP's
T>xxxxxx	Speedbase Presentation Manager TAP's
\$MENUxxx	User-defined menu files
\$\$DOMxxx	\$VOLSAV domain layout files

```

$AUTH      $AUTH authorisation file
$UREQM     End-user system request menu file
$OPID      Operator-id file
$GROUP     Group file
$MENUS     System menu file
$MPARAM    Menu parameter file
$UREQ      End-user system request data library
$CDES      $STATUS computer description file
$DEBUG     $DEBUG template file
++xxxxxx  Configuration file
$DIAL      Comms Support Pack component
$DIALX     Comms Support Pack component
$FCOMM     Comms Support Pack component
P.QG       Comms Support Pack component
P.BC       Comms Support Pack component
$TAPE      $TAPE component
$TAPED     $TAPE component
P.$TAPE    $TAPE component
TACUS      $TAPE component
$OZ        Global Organiser component
$$$JOB     End-user restore customisation job
S. $$$LST  End-user restore customisation list

```

It is possible to add extra, site-specific files to the above list. This is achieved by creating a text file, S. \$\$\$LST, containing a simple list of the extra files (one file per line) to be copied back to SYSRES after Global System Manager has been installed. If a S. \$\$\$LST file is required it must be present on the existing SYSRES before the update installation is attempted.

Important note: Each file listed in the S. \$\$\$LST file is simply copied, from BACSAV to the newly installed V8.1 SYSRES, using the \$F COP command. If a file, listed in the S. \$\$\$LST text file, is not present on the BACSAV volume, the restoration of the previous customisation will fail leaving the newly installed Global System Manager in an unpredictable state. The BACSAV volume is created, during the installation, by copying all the files from the existing SYSRES volume. Ensure that only files actually present on the existing SYSRES volume are included in the S. \$\$\$LST text file before starting the installation.

When the components in the above list (and in the optional S. \$\$\$LST file) have been restored to the newly installed SYSRES volume an optional, end-user defined, post-installation customisation job is invoked. If this job, \$\$\$JOB, is required it must be present on the existing SYSRES before the update installation is attempted.

If the save/restore existing customisations option is selected then it is not possible to apply the new V8.1 customisation options (e.g. \$MAIL, \$GROUP customisations) to the freshly installed Global System Manager. These customisations must be applied using the "Install Extra Facilities" option of \$CUS as explained in Chapter 6 of the Global System Manager Manual.

2.3.6 Exiting from the Global System Manager Installation

When customisation is complete exit Global System Manager by keying:

```

Installation of Global System Manager is now complete.
You should now restart Global System Manager as described in the Global
Operating Manual.

```

Key <CR> then run \$BYE to terminate Global System Manager:
GSM READY: \$BYE

2.3.7 Starting the Installed Global System Manager

When the installation of Global System Manager is complete you are recommended to check the installation as described in sections 2.5, then to install your other Global software modules as described in 2.6. You are advised to take backup copies of the installed Global System Manager as described in 2.7.

Note that there is little point taking a backup of Global System Manager before installing other software, as the menu (which is held on the SYSRES disk) will be updated as you install further software.

The final steps involve propagating the Global Client software on computers other than the Master Server.

2.3.7.1 Starting the Global Server

There are a variety of techniques available that allow you to initiate a Global Server under Windows NT. These techniques are fully described in sections 6.4 and 6.5. If the Server initiation completes successfully, it will appear minimised (i.e. as an icon on the desktop on Windows NT V3.51; or as a task-bar entry on Windows NT V4.0 or Windows 95).

2.3.7.2 Starting the Global System Manager - Client

Once the Global Master Server is running the Global Client can be initiated by running the GLOBAL.EXE utility using any of the methods described in section 6.2.

A "Splash Screen" will appear briefly before the main menu is displayed in the Global System Manager window.

2.4 Errors During Installation

This section describes the error conditions most likely to arise during installation. If you get an error message that is not described here consult Appendix C of this manual and Appendix A of the Global System Manager Manual.

No bootstrap found on boot device

This Message Box will appear if you attempt to load a Global Client before installing on the Global Server.

Unable to find bootstrap file: bootstrap_filename

This Message Box will appear if the GL-IPL.DLV file has not been copied to the Global Client directory after a Global Client installation.

The BACRES diskette is not in the diskette drive Please mount this diskette and restart the installation

This Message Box will appear if an attempt is made to install Global System Manager from diskette before inserting the BACRES diskette in the A: diskette drive.

The bootstrap file: bootstrap_filename is in use by another process

This Message Box will appear if the Global Client is already running on the workstation.

PLEASE MOUNT name ON description - uuu AND KEY <CR>

If this message is repeated when you key <CR>, despite the correct diskette being mounted, then check that you have put the disk in the drive correctly. Also check the unit number (uuu) against your Global Configuration Notes to make sure that you are using the appropriate type of diskette. If everything appears to be correct, treat it as a READ error, as described later on in this section.

\$57 message

\$66 message

\$99 message

These error messages are explained in Appendix B.

- * **READ ERROR ON description - uuu**
- * **WRITE ERROR ON description - uuu**
- * **H ERROR ON description - uuu**

Key <CR> to retry, as these errors sometimes are transient. If it is a diskette which has the error, try taking it out of the drive, reinserting it and trying again. If this does not work then proceed as described below.

If the disk in the indicated drive is BACRES, BEA, HAA or EPA then your computer is unable to read the distribution diskette. The most likely reason is that it has been damaged in some way (e.g. by a fingerprint on the recording surface). Contact your supplier for a replacement. If this also fails then the diskette drive on your computer is probably out of alignment, and needs servicing.

- * **HARDWARE PROTECTION ON description - uuu**

The installation process needs to write to the diskette in the drive described, but cannot do so because it has been 'write protected'. Remove the write protection and key <CR> to continue.

2.5 Checking Your New System

You should now have a correctly installed Global System Manager. Load Global System Manager as described in Chapter 3.

If all is well the main menu should appear. There should be **no** error or warning messages beginning with \$57 or \$99. If there are consult Appendix B for an explanation and suggested recovery action.

If the installed software includes a Speedbase Presentation Manager Run-Time Licence the following message and prompt will appear:

The annual rental fee password is shown on the advice note.

Please key password:

To use the installed software a rental fee password, consisting of a single digit followed by 13 letters, **MUST** be supplied.

A menu ending with a selection prompt will now be displayed (or a GSM READY: prompt if you elected not to use a menu). You can run command programs by keying their names to either prompt.

2.5.1 Checking Serial Screens

THIS SECTION CAN BE IGNORED FOR ALL STANDARD CONFIGURATIONS.

If the configuration includes any serially-connected screens you should perform further tests to make sure that the option switches on the terminal are set correctly, and that the correct terminal code is being used. (Quite often it is necessary to disable "auto-wrap" and "auto line-feed".) To test the terminal, run command \$T and key TEST to its first prompt. This will give you a menu of test options. You should try tests 1 (dimensions), 6 (clear screen and cursor positioning) and 7 (extended control functions).

In the **dimensions screen** test, every character position, except one, of the available display area should be filled with a digit. The only exception is the rightmost character of the bottom line, which should be a colon to indicate that the screen serves as a prompt. If the screen display is not as described, but contains lots of blank lines, this is probably because an erroneous option switch setting is causing the terminal to automatically generate a new line sequence when the rightmost character of each line is displayed. Correct the switch setting, key <CR> to the colon prompt to return to the menu, and select the dimensions test again by keying 1.

The **clear screen and cursor positioning** test should result in a display where the screen is bordered by a continuous frame of digits. The cursor should be located to the right of a colon prompt, which appears in the top left hand corner, just inside the framing digits. If the screen does not appear like this you have probably specified the wrong terminal type during installation.

The **extended control functions** test checks that special keys on the keyboard generate the expected characters. You will be prompted with the names of 17 special keys in turn. Reply to each one by pressing the corresponding key. If the result is not as expected, ERROR will be displayed and the prompt repeated. If you are unable to find the correct key, reply N to go to the next one. If any of the keys are incorrect, but the previous two tests worked, then you have probably used the terminal code for a different version of the keyboard.

When you have completed the tests key <ESCAPE> to exit.

2.5.2 Checking the Printer

You should now check that your printer is working correctly. If you have installed the Global System Manager spooler, you will first need to reassign the standard printer (\$PR) to the real printer (\$RP) by running command \$A:

```
PLEASE SELECT A FUNCTION: $A
.....
..... (list of current assignments)
.....
$69 UNIT: $PR ADDRESS: $RP
$69 UNIT: <ESCAPE>
```

Run command \$T (screen description) and key P to its prompt to print out a description of your screen. Check that it is printed correctly, with no missing characters or lines.

If you have more than one printer then use \$CUS to set up the characteristics of the other printers as described in section 6.1 of the Global System Manager Manual, and then test these printers as described above.

2.6 Installing Other Global Software (\$INSOFT)

You are now ready to start installing other Global software modules such as Global Sales Ledger, Global Writer or Global Cobol. If you have chosen to use a menu (the default option) then select function 1, "Install Global Software:" (otherwise run the command \$INSOFT from the GSM READY: prompt).

You will be asked to supply the name of the first distribution disk (2 letters followed by "A", printed in the top left corner of the label). You are then asked for the diskette format code (3 to 6 characters, printed in the bottom right corner of the label).

\$INSOFT then loads and invokes an installation job called xxINS from the distribution diskette. If you have mounted the diskette in the wrong drive (or used the wrong diskette) \$INSOFT displays a mount message of the following form:

```
PLEASE MOUNT xxA ON diskette_drive - nnn AND KEY <CR>
```

\$INSOFT will also accept the unit number of the diskette drive (e.g. 140) as an alternative to the format code (e.g. 02A).

Each software module has a section in its user manual describing installation. You are advised to check all these sections before starting, to see whether the modules need to be installed in a specific order. In particular, some of the accounting modules require other modules to be installed first.

Normally you would delete the \$INSOFT menu entry after the application software as been installed so as to avoid confusion. The \$INSOFT command can still be used, of course, by invoking it by name from the GSM READY: prompt or menu.

2.6.1 Installing Global Software - Important Note

The installation jobs for some of the more mature Global applications (e.g. Global Finder, Nominal Ledger) require the presence of a local Discrete Data File Domain. That is, the installation job will fail if a disk unit in the range 200-299 is unavailable (the available disk units are displayed by the \$U command - see section 4.9). In order to install applications such as Global Finder and Nominal Ledger, the software must be installed on a local sub-volume (on a Global Client configured with a local DDF - see sections 2.2.4.4. and 2.2.4.5). Once the product installation has been completed, the equivalent Windows sub-volume file(s) are copied to a Domain Directory accessed by the required Global Server. This specialised technique is explained in full detail in section G.39.

This installation problem does not apply to the recent Global 2000 and Global 3000 applications.

2.7 Global System Manager Backup and Reinstallation

Once you have installed Global System Manager and all your Global software, you should take a backup copy of Global System Manager and its customisation. **This precaution is absolutely vital.** If you ever need to reinstall Global System Manager you can avoid repeating the customisation of the main menu and table of authorized users by restoring the backup copy of the customisation.

2.7.1 Backup Copy of Global System Manager

Taking a backup copy of Global System Manager is simply achieved by using a suitable Windows backup utility (e.g. Windows Backup manager) to make a backup of the Global directory and all its sub-directories.

2.7.2 Backup Copy of the Global System Manager Customisation

You can take a copy of the customisation by running \$CUS, selecting the "System Maintenance" function and the "Save current customisation" sub-function. You are given the option to save the customisation on diskette or on a sub-volume on the hard-disk.

If you select to save the customisation onto diskette, a new pre-formatted (or pre-initialised) diskette called BACSAV is required. The "Save current customisation" sub-function will copy the customisation files to the BACSAV diskette. You should then put this diskette away safely with the BACRES, BEA, HAA (and optional EPA) diskettes. You are recommended to save the current customisation in this way every month, so that the BACSAV disk contains the latest menus and list of users.

If you select to save the customisation on a sub-volume on the hard-disk, \$CUS will create a new sub-volume called BACSAV (or use an existing one if available) and copy all the files from SYSRES to the BACSAV sub-volume.

It is also advisable to create an "emergency SYSRES diskette" by running \$CUS, selecting the "System Maintenance" function and then selecting the "Create SYSRES diskette" function.

2.7.3 Re-installing the Global System Manager BACNAT components

To re-install the software distributed on the BACNAT volume, run the SETUP utility as described in section 2.2.2. Select a "Standard Installation" (see section 2.2.2.3) and the relevant "Global Program Folder" (see section 2.2.2.4). The "Install Type Dialogue Box", as described in section 2.2.2.5, will appear. Select either a "Global Client" or a "Global Server" (if you are re-installing a Client-Server configuration into the same Global directory, SETUP will have to be run twice).

2.7.3.1 Re-installing the Global Client Components

If a Global Client re-installation is attempted, SETUP will recognise that a Global Client is already installed (by detecting the presence of certain Registry keys) and will display the "Select Upgrade Types" Dialogue Box. Check either, or both, the "BACNAT Components" and "GSM Components" check-boxes to indicate which components are to be re-installed.

If the "BACNAT Components" check box is checked, SETUP will copy all the executable programs (i.e. *.EXE) listed in section D.2.1 from the BACNAT media to the Global directory.

If the "GSM Components" check box is checked, SETUP will merely copy the GLINSCLI.BAT file from the BACNAT media to the Global directory (thus allowing Global System Manager to be re-installed on a Local SYSRES).

Important note-1: The "Upgrade GSM Components" option does NOT re-install Global System Manager.

Important note-2: No actual diskette activity will take place: SETUP extracts and un-compresses the various files from the BACNAT media to a temporary directory on the hard disk (see section 2.2.2.1),

2.7.3.2 Re-installing the Global Server Components

If a Global Server re-installation is attempted, SETUP will recognise that a particular Global Server (e.g. "A") is already installed (by detecting the presence of certain Registry keys) and will display the "Select Upgrade Types" Dialogue Box. Check either, or both, the "BACNAT Components" and "GSM Components" check-boxes to indicate which components are to be re-installed.

If the "BACNAT Components" check box is checked, SETUP will copy all the executable programs (i.e. *.EXE) listed in section D.2.2 from the BACNAT media to the Global directory.

If the "GSM Components" check box is checked, SETUP will merely copy the GLOBAL.EXE and GLINSSRV.BAT files from the BACNAT media to the Global directory (thus allowing Global System Manager to be re-installed on the Master Server).

Important note-1: The "Upgrade GSM Components" option does NOT re-install Global System Manager.

Important note-2: No actual diskette activity will take place: SETUP extracts and un-compresses the various files from the BACNAT media to a temporary directory on the hard disk (see section 2.2.2.1),

2.7.4 Re-installing the Global System Manager BACRES components

If you need to reinstall Global System Manager use the GLINSSRV.BAT batch file to load the Starter System from BACRES as described in section 2.3.1.

Once the installation has completed and you have reloaded the newly installed Global System Manager, run the \$CUS command, select the "System Maintenance" function, and then select the "Restore saved customisation" function. This will copy the saved menus, table of authorized users and system customisation from a BACSAV diskette to the freshly installed system. Note that this option **cannot** be used to restore customisation from a BACSAV sub-volume.

2.8 Installing Additional Global Clients

The procedure described in sections 2.2 to 2.7 describe the installation of the Master Server and a single Global Client on the same computer. Although such a configuration is useful for preliminary evaluation and testing, it does not represent a typical end-user configuration.

Once Global System Manager has been installed on the Master Server, the installations on the various Global Client computers can commence.

This section only describes the standard single-Server, multiple-Client configuration. Appendix H describes several alternative configurations.

2.8.1 Using SETUP.EXE to Install a Global Client

Start SETUP.EXE as described in section 2.2.2 and select the required Installation Option as described in section 2.2.2.3. Select an appropriate Program Folder (see section 2.2.2.4) and choose the "Global Client" installation option as described in section 2.2.2.5. The rest of the dialogue is as described in sections 2.2.4.1 to 2.2.4.11 (the Installation Directory, described in section 2.2.4.2, must be freshly created).

Important note: It is NOT possible to simply load the Global Client immediately. Any attempt to load the Global Client immediately after SETUP.EXE has completed will result in the fatal error described in section C.1.1.3 (if no local SYSRES was specified) or C.1.1.4 (if a local SYSRES was specified).

2.8.2 Post SETUP.EXE Installation Procedure

The details of the post SETUP.EXE installation procedure for a Global Client after depend on the reply to the "Local SYSRES" Dialogue Box (see section 2.2.4.4).

2.8.2.1 Post SETUP.EXE Installation Procedure (no Local SYSRES)

This step merely involves copying the GL-IPL.DLV file from the Global directory on the Master Server to the Global directory on the local computer.

Important Note: This simple Windows file copy must be performed **AFTER** Global System Manager has been installed on the Master Server (as described in section 2.3)

2.8.2.2 Post SETUP.EXE Installation Procedure (Local SYSRES)

This stage involves a "traditional" Global System Manager installation from BACRES, BEA etc onto the local Discrete Data File Domain.

Important note: Unlike the Master Server installation described in section 2.3, a SYSIPL volume will NOT be created by the Local SYSRES installation.

2.8.2.2.1 Loading the Starter System

Begin the installation process by loading the simple starter system supplied on the distribution diskettes, commencing with the first system diskette which is labelled BACRES. The name of the diskette appears in the top right hand corner of the label.

Insert the BACRES diskette into diskette drive A: and load the Global System Manager installation system by running the GLINSCLI.BAT batch file from the Global directory.

Important note: The "Install Global System Manager on Client with Local SYSRES" batch file, GLINSCLI.BAT, is deliberately NOT iconised. This function will only be used once per installation - creating an icon to perform this essentially administrative task would clutter up the desktop environment for normal operators.

The computer will access the diskette for approximately 10 seconds and then the Global System Manager Splash Screen will appear. After another small delay the Splash Screen will be replaced by a window containing the standard sign-on screen.

Do not be disturbed by the WARNING messages that may appear when loading Global System Manager from the distribution diskettes or tape. They indicate that Global System Manager has re-configured itself dynamically to match your computer set-up more closely. The messages are suppressed once Global System Manager has been installed.

Proceed with the installation as described in sections 2.3.3 to 2.3.6.

2.9 Upgrading Global System Manager (Windows NT)

The steps required to upgrade Global System Manager depend on the software layer, or layers, that are to be upgraded (see section 1.5).

2.9.1 Upgrading the Variant of the BACNAT Software

To upgrade ONLY the variant of the BACNAT software (see section 1.5.4) distributed on the BACNAT diskettes use the technique described in section 2.7.3.

For example, this option is used to upgrade from BACNAT variant 2.1 to variant 2.2.

Important note: The BACNAT upgrade must be performed on the Global directories of all the computers on the network. For a standard installation, this involves upgrading the Global directory on the Master Server and the Global directories for all the Global Clients.

2.9.2 Upgrading the Global System Manager Version

This section provides an overview of the steps required to upgrade the version (e.g. from V8.1 to V8.2) of an installed Global System Manager (Windows NT) configuration (see section 1.5.1).

The upgrade of an existing Global System Manager (Windows NT) installation from diskette is a two-stage process. Firstly, upgrade the BACNAT software using the procedure outlined in section 2.9.1. This first step is necessary because a new BACNAT variant almost always accompanies a new version of Global System Manager (in any case it is always prudent to upgrade to the most recent BACNAT variant).

Secondly, upgrade the BACRES software using the technique described in section 2.7.3. The steps described in sections 2.1.7 to 2.1.12 should be followed to complete the upgrade installation. When performing an upgrade installation you will probably want to select the option to save and restore the existing Global System Manager customisation as described in section 2.1.10.

Important note: The BACRES upgrade must be performed on all the SYSRES volumes on all the computers on the network. For a standard installation, this involves re-installing on the SYSRES volume on the Master Server and the SYSRES volumes, if any, on all the Global Clients that load from a Local SYSRES.

2.9.3 Upgrading the Global System Manager Revision

This section provides an overview of the steps required to upgrade the revision (e.g. from Global System Manager V8.1, revision V8.1g to

Global System Manager V8.1, revision V8.1h) of an installed Global System Manager V8.1 (Windows NT) configuration (see section 1.5.1).

The upgrade of an existing Global System Manager (Windows NT) installation from diskette is a two-stage process. Firstly, upgrade the BACNAT software using the option described on section 2.9.1. This first step is necessary because it is always prudent to upgrade to the most recent BACNAT variant.

To complete the revision upgrade, load a Global Client in the normal ways and use \$CUS to upgrade the Global System Manager revision from the BACRES, BEA etc. diskettes as described in the Global System Manager V8.1 Notes (document MSMNV8.1).

Important note: The Global System Manager revision upgrade must be performed on all the SYSRES volumes on all the computers on the network. For a standard installation, this involves upgrading the SYSRES volume on the Master Server and the SYSRES volumes, if any, on all the Global Clients that load from a Local SYSRES.

2.10 Using Windows UnInstall to remove Global System Manager

The UNINST.EXE utility distributed on the BACNAT diskette (see section D.1.1) can be used to completely remove Global System Manager from a Windows NT or Windows 95 computer. This program cannot be run explicitly using any of the standard Windows Techniques - it requires an obligatory command line parameter. the following methods are available to Uninstall Global SystemManager:

- On Windows NT 3.51, click on the "Uninstall" icon in the Global System Manager Program Group. Note that this icon is setup by the SETUP utility;
- On Windows 95 and Windows NT V4.0 use the "Add/Remove Programs" option from the Windows Control Panel.

Important note-1: The Uninstall option deletes all the components installed by the previous use of the SETUP utility. The following components will be removed:

- files;
- directories;
- Registry entries;
- icons;
- Program Groups.

THE UNINSTALL OPTION WILL REMOVE ALL DATA VOLUMES WITHIN THE GLOBAL DIRECTORY. THIS MAY INCLUDE "LIVE DATA". CONSEQUENTLY, THE UNINSTALL OPTION SHOULD BE USED WITH EXTREME CAUTION.

Important note-2: Because UnInstall only removes the Global System Manager components installed by the previous invocation of SETUP, it is possible to leave a partial copy of Global System Manager on a computer (e.g. with incomplete Registry entries) if SETUP has been

used more than once. For example, if SETUP is used to install a Master Server (i.e. Server "A") and the obligatory Global Client, and at some time later, SETUP is used to install Global Server "B" in a different directory, the UnInstall utility will completely remove Server "B" but will leave Server "A" and the Global Client partially installed.

3. Running Global System Manager

This chapter explains how to run Global System Manager under the Windows NT operating system.

Once Global System Manager has been started it is then responsible for running the Global range of application software.

3.1 Starting Global System Manager

Before attempting to use Global System Manager you should ensure that all the peripheral devices are ready, that printers have plenty of paper and are properly aligned at the top of the page.

3.1.1 Starting Global System Manager from Windows NT

Before attempting to load a Global Client, the Master Server, and all other Global Servers that will be accessed by the Global Client, must be available.

3.1.1.1 Starting a Global Server

There are a variety of techniques available that allow you to initiate a Global Server (or Servers) under Windows NT. These techniques are fully described in sections 6.4 and 6.5. If the Server initiation completes successfully, it will appear minimised (i.e. as an icon on the desktop on Windows NT V3.51; or as a taskbar entry on Windows NT V4.0 or Windows 95).

3.1.1.2 Starting a Global Client

Once the Master Server is running (either on the local computer or on a remote server), workstations can initiate a Global Client by running the GLOBAL.EXE utility using any of the methods described in section 6.2.

A "Splash Screen" will appear briefly before the main menu is displayed in the Global System Manager window.

3.1.2 The Windows NT Date and Time Information

Global System Manager normally obtains the date and time information from Windows NT. If the date-time information supplied by Windows NT is more than an hour earlier than the last time Global System Manager was used, or more than a week later, a warning message will appear. For example:

```
WARNING - DATE IS MORE THAN 6 DAYS LATER THAN PREVIOUS DATE
```

or:

```
WARNING - DATE/TIME IS EARLIER THAN PREVIOUS
```

3.1.2.1 Non-standard Date and Time Prompts and Messages

If an automatic operator-id or terminal-type has not been established (see section 8.3.1.2.2) the Date/Time prompts and messages described in this section may appear.

Important note: This section is included for completeness only: The messages described herein should never appear on correctly configured systems.

Normally, Windows NT will supply the date and time information to Global System Manager. If the date and time supplied by Windows NT are valid, the following prompt will appear:

```
CONFIRM THIS IS 7:30 am Saturday 24 November 1990 (Y):
```

Reply <CR> if both the date and time are correct.

If either the date or time supplied by Windows NT are incorrect, you can key N to the confirm prompt to change them. For example:

```
CONFIRM THIS IS 10:00 am Monday 29 October 1990 (Y):N
PLEASE KEY DATE DD/MM/YY (29/10/90):<CR>
PLEASE KEY TIME HH.MM (10.00.02):9.00
```

Note that changing the date or time information will only affect the current Global System Manager session. The Windows NT date/time is NOT affected by changing the Global System Manager date/time.

If the date-time information supplied by Windows NT is more than an hour earlier than the last time Global System Manager was used, or more than a week later, a warning message will appear. If the date and time are correct you must key Y to continue (not <CR>). For example:

```
WARNING - DATE IS MORE THAN 6 DAYS LATER THAN PREVIOUS DATE CONFIRM THIS IS
10:00 am Monday 29 October 1990 (N):
```

If Windows NT is unable to supply a valid date, the following prompt will appear:

```
PLEASE KEY DATE DD/MM/YY:6/2/95
```

or:

```
PLEASE KEY DATE MM/DD/YY:2/6/95 ('American' format)
```

Reply, as shown, with the date in the indicated format. You may key a full stop (period) or comma in place of the / character if you prefer. Once you have supplied the date you will be prompted for the time of day:

```
PLEASE KEY TIME HH.MM:16.30
```

The 24-hour clock is used (this reply sets the time to 4.30 pm).

When you have keyed the date and time you will be asked to confirm that they are correct:

```
CONFIRM TODAY IS 4.30 pm Monday 6th February 1995 (Y):
```

Key <CR> if it is correct, or N to change the date and time.

If the date-time information specified is more than an hour earlier than the last time entered, or more than a week later, a warning message will appear as it is likely that you have made a mistake. If the date and time are correct you must key Y to continue (not <CR>).

3.1.3 Local Area Networks

All Global System Manager (Windows NT) configurations are Client-Server (i.e. networked) configurations. Consequently, you may not be able to start a Global Client successfully on a workstation until another computer on the network, with the SYSRES disk you need to access, is running a Global Server process. If the SYSRES volume cannot be accessed, the following error message and prompt will appear:

```
* COMPUTER NOT AVAILABLE ON xxx - RETRY?:
```

where xxx consists of a letter, to identify the machine in question, and a two figure number indicating the drive on that machine where SYSRES should be mounted (e.g. A01). Load a Global Server on the other computer and key <CR> to the retry prompt on your own computer to try again.

If the other computer cannot run a Global Server (because of hardware error, for example), key N to the retry prompt and the following message will be displayed:

```
$57 KEY NEW SYSRES UNIT:
```

You should supply the address of SYSRES on another computer running a Global Server (if there is one on the network) which your Client can access. If there isn't one then the network will have to be reconfigured or Global System Manager re-installed.

Important note: On a standard Global System Manager (Windows NT) configuration (i.e. with one Server and multiple Clients) it will NOT be possible to supply the address of an alternative SYSRES volume.

A similar problem can arise if you try to initiate a Global Client on a workstation and the Master Server, which accesses the User File necessary for sign-on, is not running. The following message will appear:

```
$57 MASTER COMPUTER UNAVAILABLE  
$57 KEY UNIT OF SYSRES ON NEW MASTER COMPUTER:
```

If the Global Server can be run then do so and then key <CR> to continue loading the Global Client. If it is not possible to run the Global Server, then you will have to supply the address of SYSRES on another Server which can serve temporarily as the new Master Server. You will then have to start the "new" Global Server before you can continue loading the Global Client. If the Master Server is permanently disabled, Global System Manager will have to be re-installed.

Important note: On a standard Global System Manager (Windows NT) configuration (i.e. with one Server and multiple Clients) it will NOT be possible to supply the address of an alternative "master" Server.

3.1.4 Speedbase Presentation Manager Licence Fee Password

If the installed software includes a Speedbase Presentation Manager Run-Time Licence the following warning message will appear within 30 days of the expiry date:

```
Your Presentation Manager rental is due by dd/mm/yyyy.
```

```
Please key password, <CR> to continue:
```

The rental fee password, obtained from your software supplier, consists of a single digit followed by 13 letters. Note that either upper-case or lower-case letters are acceptable.

If the installed software includes a Speedbase Presentation Manager Run-Time Licence the following warning message will appear when the licence expires:

```
You are in danger of infringing your licencing agreement.
```

This software expired on *dd/mm/yyyy*.

Please contact your software supplier to obtain a new password.

In emergency contact the "Emergency Rental Review Department" on *phone number (international phone number)* before 16th April 1995 or *phone number (international phone number)* after 16th April 1995.

Please key password, <CR> to continue.

The rental fee password, obtained from your software supplier, consists of a single digit followed by 13 letters. Note that either upper-case or lower-case letters are acceptable.

If the installed software includes a Speedbase Presentation Manager Run-Time Licence the following warning message will appear 14 days after the licence expiry date:

You have infringed your licencing agreement.
This software expired on *dd/mm/yyyy*.

Please contact your software supplier to obtain a new password.

In emergency contact the "Emergency Rental Review Department" on *phone number (international phone number)* before 16th April 1995 or *phone number (international phone number)* after 16th April 1995.

Please key password:

A rental fee password, obtained from your software supplier, consisting of a single digit followed by 13 letters **MUST** be applied. Note that either upper-case or lower-case letters are acceptable.

3.2 Global Client Start-Up

The Global Client start-up is normally performed invisibly. Under some circumstances, additional prompts may appear before the main menu is displayed.

3.2.1 The Splash Screen and the Contract Protection Message

The Global System Manager Splash Screen refers to the licencing information described in the Global System Manager "Help/About Box" (see section 5.3.3.5). This information consists of a title line containing your Global System Manager serial number, Global Client node-id number and user number. Appearing below the title line is the Contract Description, a short summary of your licensing agreement. **PLEASE ENSURE THAT YOU AND YOUR COLLEAGUES HONOUR THIS AGREEMENT AT ALL TIMES.**

Note that Global System Manager customisation that suppresses the display of the Contract Protection Message (see section 2.4.9 of the Global Configurator Manual for more details) is permanently enabled on Global System Manager (Windows NT) configurations.

3.2.2 The Operator-id Prompt

This section is documented for completeness only and will not be relevant if Global System Manager has been installed and configured correctly.

Normally, your Global System Manager operator-id will be derived from the Registry (see section 8.3.1.2.2). If your Global System Manager

operator-id cannot be determined from the information within the Registry, the following prompt will appear:

```
PLEASE KEY YOUR OPERATOR-ID:
```

Reply with your operator-id, a code up to four characters in length. Normally, you just use your initials, but sometimes special codes will be allocated by your system supervisor.

3.2.3 The Terminal Type Prompt

This section is documented for completeness only and will not be relevant if Global System Manager has been installed and configured correctly.

Normally, the information that Global System Manager requires to operate on your work-station will be derived from the Registry (see section 8.3.1.2.2). If the Global System Manager terminal information cannot be determined from the information within the Registry, a prompt of the following form appears:

```
PLEASE KEY TERMINAL CODE (code):
```

requesting you to supply the terminal code identifying the device. The default terminal code, displayed in brackets, is the code used for the previous Global System Manager session on the terminal. Usually, the default terminal code will be correct. However, the default terminal code will NOT be correct if this is the first time your screen has been used to run Global System Manager, if you have changed terminals (e.g. replaced a Wyse-50 screen by a Wyse-60) or if \$STATUS has been used to purge the User File. You can, if necessary, list the available terminal codes by keying LIS. For example:

```
PLEASE KEY TERMINAL CODE (711 ):LIS
0      BASIC TELETYPE SUPPORT ONLY
161    MICROCOLOUR M2200
163    WYSE WY-50+
187    WYSE WY-370 (ANSI KEYBOARD)
197    TCL NyCE COLOUR TERMINAL
711    GLOBAL WINDOWS WORKSTATION (GUI)
PLEASE KEY TERMINAL CODE (711 ):711
```

In this example, Global System Manager continues, knowing you are using the GUI sub-system.

If the terminal information derived from the Registry does not correspond to a valid Global System Manager terminal code, the following messages will appear:

```
TERMINAL TYPE nnnn NOT FOUND
$57 INITIATION WARNING 450 - INVALID TERMINAL TYPE
```

The warning message will be followed by the PLEASE KEY TERMINAL CODE: prompt described above.

Important note: If this is the first time your screen has been used, or if Global System Manager has been reloaded after the \$STATUS PUR command (see the Global Utilities Manual) has been used to purge the \$\$USER file, the default terminal type (in brackets) may be incorrect or inappropriate. If in doubt, use the LIS command (as above).

The numeric terminal code may be prefixed by one of the following letters:

- E The screen is being used by a terminal emulator package. This option is obsolete - do not use;
- W Start the Global System Manager session in "wide-mode" if the terminal supports wide-mode working.

3.2.4 The Password Prompt

If your installation has decided to employ authorization checking, you will now be prompted for your password:

```
PLEASE KEY PASSWORD:
```

You should enter the password, which for security reasons will not be displayed on the terminal. If you want to change your password then key it as usual but terminate the input with <CTRL B> rather than <CR>. You will then be prompted for a new password. The option to change the password at sign-on is only allowed if the password is less than 8 characters. If the password is 8 characters in length then it can only be changed using \$AUTH as documented in section 6.3 of the Global System Manager Manual.

If you have supplied an invalid operator-id or password the following message will be displayed:

```
$94 YOU ARE NOT AUTHORIZED TO SIGN-ON - PLEASE CONTACT A SUPERVISOR
```

This message is followed by the initial sign-on screen. The above warning message is also displayed if you key <ESCAPE> to either the operator-id or password prompts.

3.3 Global System Manager

The following sections in this chapter briefly summarize the information described in the Global System Manager Manual.

The rest of this chapter has been written in a general-purpose manner. If you are running the Global Client on the integral screen on workstation, this section should be read in conjunction with Chapter 5 which describes the Global System Manager "Graphic User Interface" in complete detail.

3.4 The Main Menu and Ready Prompt

Once the start-up procedure is complete, the main Global System Manager menu will be displayed, unless your installation has decided not to use menus. You will be able to select any one of up to 16 functions by simply keying the appropriate number (terminated by <CR>, of course) in response to the selection prompt which appears at the bottom of the screen. Once the selected function completes, the main menu will be redisplayed so you can continue with other work. **Important note:** If you are using the Global System Manager "Graphical User Interface", the behaviour of menus will be different (see section 5.3.2.1).

You should note that some menu functions may be restricted to operators with special authority codes. If you are not allowed to use a particular function the menu entry the corresponding menu line will

be marked in a special manner (i.e. normally "grey-out" - on a serial screen an asterisk will be displayed instead of the function number).

Provided you have a sufficiently high authority code, you can run any Global System Manager command (or indeed, any other program) by keying its name in response to the selection prompt, instead of a function number. For example, you can key \$T to run the screen information command which displays or prints a page of information about your screen and keyboard. You can also get out of the main menu to the GSM Pn READY: prompt by keying the word READY in response to the selection prompt. **Important note:** If you are using the Global System Manager "Graphical User Interface", the technique required to run a program will be different (see section 5.3.2.1).

If you have chosen not to use menus, then instead of a menu the GSM Pn READY: prompt will be displayed by Global System Manager when you sign on. You can key the name of any command or program in response to this prompt to cause it to be run.

3.5 Concurrent Screen Handling

Concurrency allows you to run several programs from one screen. Associated with each physical screen are up to 9 partitions (usually 4) each of which can be running a different program. At any time the screen will be displaying one of the partitions, as indicated by the status line at the top (or sometimes the bottom) of the screen showing the partition number. For example:

```
Partition 1
```

On some screens, the writable portion of the status line does not extend across the entire width of the screen. On such screens the partition number information will be condensed. For example:

```
P1
```

If your screen does not have space to display the status line permanently, you can use the <SYSREQ> M system request to cause it to be displayed temporarily over the top line of the screen, and <SYSREQ> Z to remove it. Chapter 4 of the Global System Manager Manual fully describes system requests.

The partition number is followed by the Computer identification number. For example:

```
Partition 3 Computer 30
```

Again, this message may be condensed if the writable portion of the status line is shorter than the screen width. For example:

```
P2 C30
```

The partition number will also appear in the Global System Manager GSM Pn READY: prompt (e.g. GSM P3 READY:). You can swap to another partition by entering a special keystroke, usually <SYSREQ> 1 for the first partition, <SYSREQ> 2 for the second, etc. (If some key other than <SYSREQ> is used the screen information command \$T will tell you which.)

Important note: If you are using the Global System Manager "Graphical User Interface", more convenient methods to change partition will be available (see section 5.3.3.1).

A program will continue running, and writing messages to the screen (FOR A LIMITED PERIOD UNTIL AN INTERNAL DISPLAY BUFFER FILLS UP), even if its partition is not the one selected, but you will only be able to read the messages when you swap back to its partition. However, if a program needs a response keying it will be halted until you swap to its partition, since the keyboard always sends characters to the currently selected screen.

Important note: If you are using the Global System Manager "Graphical User Interface" the behaviour of "background" partitions is different from text-based screens.

Concurrency enables you to leave a lengthy, automatic process (such as printing a report) running in one partition and use another partition to do something else which requires the use of the screen and keyboard (PROVIDED THE BACKGROUND PROCESS DOES NOT DISPLAY SUFFICIENT CHARACTERS TO FILL THE INTERNAL DISPLAY BUFFER). You can also break off from what you are doing in one partition in order to run an enquiry program in another, and then continue in the original partition when you have your information. You can, if you wish, leave an enquiry program permanently loaded in one partition so that you do not have to wait for it to be loaded when you need it.

3.6 Terminating Global System Manager

If you do not wish to run any further Global applications you can close the Global Client and return to Windows NT by running either the \$BYE command or use the equivalent TER instruction in \$STATUS (see Chapter 5 of the Global System Manager Manual). Before returning you back to Windows NT, if you are using a non-standard Global System Manager configuration, \$BYE performs two additional functions. Neither of these functions apply to a standard configuration. Firstly, if your computer has been configured with serial screens (see section 8.3.2) \$BYE checks that no other users are using your work-station. Secondly, if your Global Client has been configured with a local Discrete Data File domain (see section 8.2.1), \$BYE ensures that no files are open on any volume on the domain. If either of these checks fails, an error message will be displayed, and you should take the appropriate action recommended in Appendix A of the Global System Manager Manual.

The following message, displayed by \$BYE will appear fleetingly:

```
GLOBAL SYSTEM MANAGER TERMINATED
```

and the window will be closed.

\$BYE is fully described in section 4.1.

4. Additional Utilities

In this chapter we give detailed accounts of some important Global System Manager commands that are only available when the host operating system is Windows NT. These commands are not fully described in the Global System Manager Manual.

In addition, this chapter also describes those Global System Manager commands which execute in a slightly non-standard way when the host operating system is Windows NT.

4.1 \$BYE - Terminate Global Client

\$BYE should be used if you want to terminate a Global Client. For those non-standard configurations that include more than 1 user per client, \$BYE checks that no other users are running Global System Manager on your workstation. Furthermore, if your configuration includes a local data file domain (another non-standard configuration) \$BYE also ensures that no users on your workstation have files open.

Note that it is not possible to configure a Global Client with a data file domain that is accessible across a network. Consequently, there is no need for \$BYE to check if users on other computers have files open on local data file domains.

Global Servers cannot be terminated using \$BYE. To terminate a Global Server use the Windows technique described in section 6.4.1.

If your screen is configured with a number of concurrent partitions, \$BYE must be run from partition 1. All other partitions **must** be at either a menu prompt or the GSM READY: prompt. If an attempt is made to run \$BYE from a partition other than P1, the following message will appear:

```
GSM P4 READY:$BYE
CAN ONLY TERMINATE GLOBAL SYSTEM MANAGER FROM PARTITION 1
```

\$BYE does not prompt for any further information. If all is satisfactory, the following message is briefly displayed:

```
GLOBAL SYSTEM MANAGER TERMINATED
```

The Global Client window will be closed automatically.

YOU SHOULD NOT SIMPLY SWITCH OFF YOUR COMPUTER ONCE YOU HAVE RUN \$BYE. USE WHATEVER SHUTDOWN PROCEDURES ARE APPROPRIATE FOR YOUR WINDOWS OPERATING SYSTEM.

If other operators on your workstation are still active \$BYE displays the following warning message and will not terminate Global System Manager:

```
OTHER USERS STILL USING THIS SYSTEM MANAGER
Key <CR> to retry, <ESC> to abandon
```

If other operators on your workstation are accessing files on a local data file domain, \$BYE displays the following warning message and will not terminate Global System Manager:

```
FILE filename TYPE type ON UNIT uuu SHARED n USERS
User n Computer a Operator oooo
```

OTHER USERS HAVE THESE FILES OPEN ON YOUR COMPUTER
YOU MAY NOT TERMINATE UNTIL THEY HAVE FINISHED
Key <CR> to retry, <ESC> to abandon

Note that this message is very unlikely to occur in practise on a Global Client. If this message does occur, key <CR> to retry \$BYE again once these users have signed off (by using \$E - see section 4.3), or closed the necessary files (usually by exiting from an application).

If \$BYE prevents the termination of the Global System Manager session because other operators are accessing files on the local data file domain, you can key <CTRL B> to the retry prompt to terminate Global System Manager WITHOUT performing the open file checking. **THIS OPTION MUST BE USED WITH GREAT CARE BECAUSE TERMINATING GLOBAL SYSTEM MANAGER WHILE FILES ARE GENUINELY IN-USE MAY CAUSE DATA CORRUPTION.**

Note that the <CTRL B> option does NOT allow \$BYE to ignore other operators that are signed on to your workstation.

\$BYE is equivalent to the \$STATUS terminate (TER) command (see Chapter 5 of the Global System Manager Manual).

4.2 \$CUS - Modify Installed Global System Manager

\$CUS is documented in section 6.1 of the Global System Manager Manual. This section just describes those aspects of Global System Manager customisation that are not available when the host operating system is Windows NT.

4.2.1 Printer Characteristics Customisation

When Global System Manager is installed on Windows NT the printer customisation function depends on the type of printer.

4.2.1.1 DOS Printer Customisation

For MS-DOS-compatible Direct printers (either parallel or serial using the "DOSPRINT" controller described in section 8.5.1) only the generic parameters apply. For example:

```
Set up device attributes for a printer unit.  
PRINTER UNIT:500 PRINTER VIA DOS  
The printer timeout period is rounded to multiples of 10 seconds  
  
Printer timeout period (currently 20 sec):<CR>  
Does the printer automatically provide LF after CR (N):<CR>  
Do you wish the printer to throw a page at startup (N):<CR>  
Do you wish the printer to throw a page at end of file (Y):<CR>  
  
Customize printer immediately (N):Y
```

4.2.1.2 Windows Printer Customisation

For Windows printers (either parallel or serial using the "WINPRINT" controller described in section 8.5.2) only the generic parameters apply. For example:

```
Set up device attributes for a printer unit.  
PRINTER UNIT:501 PRINTER VIA WINDOWS  
The printer timeout period is rounded to multiples of 10 seconds  
  
Printer timeout period (currently 20 sec):<CR>  
Does the printer automatically provide LF after CR (N):<CR>  
Do you wish the printer to throw a page at startup (N):<CR>  
Do you wish the printer to throw a page at end of file (Y):<CR>
```

Customize printer immediately (N):Y

Important notes: The printer number determines the printer mode (i.e. Exclusive Mode or Shared Mode) as described in section 8.5.2.3). The Printer Control File (PCF) Naming convention depends on the mode as follows:

Printer Number	Mode	PCF name	PCF unit
500 - 549	Exclusive	\$\$P5nnxx	\$DP
550 - 598	Shared	\$\$P5nn	\$M
599	Exclusive	\$\$P5nnxx	\$DP

A Printer Control File MUST be specified for a Shared Mode WINPRINT printer. Furthermore, when the Printer Control File option of \$CUS is used to create/amend the Printer Control File for a Shared Mode WINPRINT printer, the following customisations MUST always be set as follows:

Stationery Sequences sent always? <u>Y</u>	6.2.1.1.2
Mount messages never displayed? <u>Y</u>	6.2.1.1.3
Honour mount messages in the middle of file? <u>N</u>	6.2.1.1.4
Never print alignment pattern? <u>Y</u>	6.2.1.1.5

The numbers refer to sections in the Global System Manager Manual that describe the customisation in full detail.

Note also that the standard Global System Manager technique of automatically sending the printer start-sequence before the first print-report is suppressed for Shared Mode WINPRINT printers. To send the printer start sequence, as defined in the Printer Control File, for a WINPRINT you must use either the \$P utility (see section 5.30 of the Global System Manager Manual) or the \$SP "I" command (see section 8.4.10 of the Global System Manager Manual).

4.2.2 System Maintenance Customisation

In the System Maintenance section of \$CUS, the "Apply nucleus update" and "Alter master node address" options are NOT available for Global System Manager (Windows NT) configurations. Note that most of the options in the System Maintenance menu expect the \$BA logical unit assignment to be accurate.

4.2.3 Configuration Maintenance

The "LAN Buffers", "RAM Disk/Cache", "Network Control Block" and "Extended customisation" options from the \$CUS Configuration Maintenance menu are NOT available for Global System Manager (Windows NT) configurations.

4.3 \$E and \$END - Operator Sign Off

\$E should be used to sign off once you have finished using Global System Manager utilities or Global applications on a serial screen. When \$E is used, Global System Manager responds by re-displaying the contract description and the operator prompt so that another user can sign on. It is particularly important to sign off using \$E if you have access to sensitive data which must be kept secure. Running \$E forces

anyone wishing to use your screen to sign on with a valid operator-id and password (providing \$AUTH has been used to set up a table of authorised users).

In addition, \$E leaves the screen in a state which can be readily displayed by the system supervisor using \$STATUS. Thus the supervisor can check to see if anyone is using the computer before turning it off at the end of the day. Note that \$BYE and the \$STATUS TER command require that \$E is run on all screens before allowing Global System Manager to be terminated.

If your screen has a number of concurrent partitions you must be in partition 1 to sign off, and all other partitions must be inactive. If you try to sign off from a partition other than partition 1, \$E will display the following message:

```
PARTITION INACTIVE
```

and you will be automatically swapped into partition 1. If you try to sign off from partition 1 while another partition is still in use, Global System Manager will display the active partition. You will have to come out of whatever program is being run in that partition and return to the main menu.

Running \$E will clear the assignment table of all temporary unit assignments. It should also be used if you want to specify a different terminal type or user-id.

Note that you can set up automatic logging off (which has the same effect as \$E) to occur if a screen has not been used for some time by using the functions of the menu system (see Chapter 7 of the Global System Manager Manual).

Important note regarding system security: The sign-on screen displayed as a result of running \$E includes the following line before the standard contract description (see section 3.2):

```
OPERATOR 0000 SIGNED OFF AT hh:mm:ss
```

If this message is left on the screen a potential hacker can glean a valid operator-id from the top line of the display. If you key <ESC> to the PLEASE KEY YOUR OPERATOR-ID: prompt that follows the contract description the sign-on screen will be redisplayed **without** revealing the identification of the previous operator.

4.3.1 \$END - Operator Sign Off

\$END is functionally equivalent to \$E on a Global System Manager (Windows NT) configuration.

4.4 \$REMOTE - Non-networked File Transfer Utility

The non-networked file transfer utility, \$REMOTE, is not available on Global System Manager (Windows NT) configurations.

4.5 \$REORG - Reorganise/Reallocate Data File Sub-volumes

The \$REORG command reorganizes the (sub-volumes) volumes of a Global data file (domain), increasing or decreasing their sizes as required. The command can also be used to reorganize files within a single

volume in a similar way. However, most Global software modules contain their own facilities to change file allocations, and if available these must be used rather than \$REORG.

Before starting to reorganize a domain or volume, you should make sure you have recent backups of all the data it contains, since if the reorganization fails some or all the data will be lost. You should also verify the disk by using the \$F VER instruction, since a read error on the disk will cause one or more volumes or files to be lost.

Important note: There is very little point in using \$REORG to simply condense the sub-volumes of a Discrete Data File domain (aka Separated Subunit Domain) as the domain layout is automatically reconstructed each time Global System Manager is invoked.

If there are volumes allocated on a domain that are no longer required these should be de-allocated, using \$V, before \$REORG is used (see section 4.10.5).

A domain or volume cannot be reorganized while files on it are in use. You should run the command when no one else is using the computer as it will lock out other users while it is in progress.

When you run \$REORG you will first be asked to specify the unit you want to reorganize. The name of the domain or volume will be displayed for confirmation. If it is not the one you want key <ESCAPE> to the subsequent prompt.

```
Please select a function:$REORG
.....
(explanatory text)
.....
REORGANIZE UNIT:200 SYSDOM
```

Next you assemble a list of the new sizes the volumes (if you specified a domain address) or the files (if you gave the address of a sub-volume) are to have after the reorganization. A series of prompts of the form:

```
KEY UNIT ADDRESS TO CHANGE SIZE, ? TO LIST, R TO REORGANIZE:
```

or:

```
KEY FILE NAME TO CHANGE SIZE, ? TO LIST, R TO REORGANIZE:
```

will appear (the unit or file prompts).

If you want to change the size of any volume on the domain, or of any file on a volume, key its unit address or name respectively. The current size will be displayed, and you can key in a new size in bytes, Kbytes or Mbytes. For example:

```
CURRENT SIZE 395264 (386.0K)
KEY NEW SIZE, OR M FOR MAXIMUM:
```

DO NOT ATTEMPT TO USE \$REORG TO TRUNCATE DMAM FILES.

If the new size you specify is smaller than the current size, the volume or file will be checked to make sure that there will remain sufficient space for its current contents. If there is not, a message will be displayed indicating the minimum possible size the volume or file's contents require. If the reduction in size requires a volume to

be reorganized so that all the files are at the beginning, the following prompt will appear:

```
UNIT uuu REQUIRES REORGANIZING - CONTINUE ? (Y):
```

Key <CR> to continue and reorganize this volume so that all the free space is at the end, or N to return to the unit prompt and leave the current volume the same size. Note that the reorganization of the volume takes place as soon as you key <CR>.

The special reply of M to the new size prompt causes the volume or file to be given all the available free space on the domain or volume. You can, of course, specify this option for only one volume on any one domain, or for one file on a volume.

To check what new sizes you have specified, and how much space is free, key ? to the unit or file prompt. Note that the new sizes shown may be slightly greater than you specified, as space is required for an index, and all sizes are rounded up to a whole number of logical tracks (for efficiency reasons the Global data format is normally coupled with the hard-disk geometry for the computer - on Windows NT this feature is relaxed to use multiples of the Windows NT kernel buffer size).

Up to this point none of the volumes or files will have been moved or had their sizes changed (though they may have been internally reorganized). If you want to abandon the reorganization of the domain or volume, key <ESCAPE> to quit and it will be left unchanged.

When you are happy with the new size allocations key R to start the reorganization process. The command displays messages indicating its progress and a "Reorganization complete" message when it has finished. If a read or write error occurs, and persists when you retry, reply N to the retry prompt. The address of the volume or file affected will then be displayed: You will need to restore this volume or file later from a backup as at least one of its files or some of its data will be corrupt. The reorganization will then continue: **DO NOT ATTEMPT TO ABANDON THE REORGANIZATION OR YOU WILL LOSE ALL YOUR DATA.** If there is an error on the domain it is likely to be reported twice: Once on the original volume containing the error, and once on the volume being moved to that part of the disk.

4.6 \$S - Obtain System Information

\$S is documented in Chapter 5 of the Global System Manager Manual. This section just describes those aspects of the System Information report that are dependent on the host operating system (i.e. Windows NT).

In addition to the information described in Chapter 5 of the Global System Manager Manual, \$S displays the BACNAT variant of the Global System Manager (Windows NT) nucleus (see section 1.5.4).

\$S does not display any details of the executive library (i.e. +.W0) or the controller library (i.e. +.W1) which are both empty in Global System Manager (Windows NT) configurations (see sections 1.5.2 and 1.5.3).

4.7 \$STATUS - Control Multi-user Configuration

\$STATUS is documented in Chapter 5 of the Global System Manager Manual. This section just describes those aspects of status-reporting that are dependent on the host operating system (i.e. Windows NT).

In addition to reporting all the operators that are currently using Global System Manager, the \$STATUS list command displays details of all Global System Manager (Windows NT) servers. In addition to displaying the file-server identifier (e.g. "A", "B" etc.), the \$STATUS report includes the description, if any, associated with each file-server. \$STATUS descriptions are established using the DES command - see Chapter 5 of the Global System Manager Manual for full details.

The \$STATUS DIS command is functionally equivalent to the RES command on Global System Manager (Windows NT) configurations.

Important note 1: The \$STATUS RES, CAN and DIS commands cannot be used to REStart, CANcel or DISconnect users on other workstations. Similarly, these commands have no effect on Global System Manager (Windows NT) servers. Thus, for most Global System Manager (Windows NT) configurations, which include only a single user per workstation, these commands are effectively useless.

Important note 2: The \$STATUS GET and REL commands only affect other users on the same workstation. Similarly, these commands have no effect on Global System Manager (Windows NT) servers. Thus, for most Global System Manager (Windows NT) configurations with 1 user per workstation, the GET and REL commands are effectively useless. However, the QUI command, which affects all Global System Manager users, does operate as documented in Chapter 5 of the Global System Manager Manual.

The \$STATUS MON command is not supported on Global System Manager (Windows NT) configurations.

The remaining \$STATUS commands work as documented in Chapter 5 of the Global System Manager Manual.

4.8 \$TDUMP - Tape Backup/Restore Utility

The cartridge tape dump/restore utility, \$TDUMP, is not available on Global System Manager (Windows NT) configurations.

Note that \$TAPE, the Streamer Tape utility, which provides a much faster alternative to \$TDUMP and is not restricted to the \$TDUMP size limitation of 127.9Mb, is available for all Global System Manager (Windows NT) configurations.

4.9 \$U - Display/Print Unit Information

\$U is documented in Chapter 5 of the Global System Manager Manual. This section just describes those aspects of the unit information that are dependent on the host operating system (i.e. Windows NT).

The general format of the information displayed by \$U is as follows:

Unit range	Description
100 - 199	Private diskettes
200 - 299	Private data file descriptions (optional)

500 - 599	Printers
600 - 699 (usually server A)	Data file descriptions on the master file server
a00 - a99	Diskettes on file server A (optional)
A00 - A99	Data file descriptions on file server A
b00 - b99	Diskettes on file server B (optional)
B00 - B99	Data file descriptions on file server B (optional)
c00 - c99	Diskettes on file server C (optional)
C00 - C99	Data file descriptions on file server C (optional)
etc.	
z00 - z99	Diskettes on file server Z (optional)
Z00 - Z99	Data file descriptions on file server Z (optional)

On most configurations only the units printed in emboldened text will be available.

Note that \$U automatically displays details of all available Global System Manager (Windows NT) servers.

To display the data file descriptions associated with a single, specific file Global System Manager (Windows NT) server, key C to the following prompt:

Key P to print, C for different computer, <CR> to page, <ESC> to exit:

and specify the file server computer-id.

For example, to display the data file descriptions associated with Global System Manager (Windows NT) server X, use the following dialogue:

Key P to print, C for different computer, <CR> to page, <ESC> to exit:C
Specify Computer-id (A):X

The information displayed by \$U describing the diskette formats supported on your system refers to the characteristics of the physical devices. For example:

```
140 02A      1ST DISKETTE DRIVE CAPACITY 1428.0K ( 63 FILES)
              2 SURFACE(S) OF 80 TRACKS WITH 18 512-BYTE SECTORS
```

The "02" diskettes are physically double-sided, double-tracking with 18 512-byte sectors.

The FORMAT is specified by an ANA code. An ANA code is made up of an Alphabetic part followed by a Numeric part and trailing Alphabetic, for example "02A". The preceding AN part ("02" in the example) describes the physical (diskette) geometry and the trailing A part ("A" in the example) describes the location of the Global directory.

The information displayed by \$U describing Discrete Data File Domains (i.e. Separated Subunit Domains, format code T259Z) refers to the maximum capacity of the volume format. For example:

```
A00 T259Z   Discrete data file CAPACITY 2047.7M (250 FILES)
           4 SURFACE(S) OF 16383 TRACKS WITH 64 512-BYTE SECTORS
```

The CAPACITY refers to the maximum capacity supported by the volume format (e.g. approximately 2Gb for volume format T259Z). The SURFACE, TRACK and SECTOR information describe a virtual disk and do not relate, in any way, to the geometry of the physical disk. Note also that the SPARE SPACE value displayed by the \$F or \$V list of a Separated Subunit Domain refers to the total amount of spare space on the Windows NT file system or DOS FAT partition (rounded down to a multiple of the virtual track size).

The information displayed by \$U describing Integrated Data File DLV's (e.g. format code Z151Z) refers to the size of the corresponding Windows file. For example:

```
110 Z151Z   Integrated data file CAPACITY 484.5M (250 FILES)
           2 SURFACE(S) OF 62 TRACKS WITH 8 512-BYTE SECTORS
```

The CAPACITY refers to the size of the corresponding Windows file. The SURFACE, TRACK and SECTOR information describe a virtual disk and do not relate, in any way, to the geometry of the physical disk.

Note that V8.1 \$U displays the maximum number of files for diskette, DLV and domain formats.

The information displayed by \$U also describes the printers that have been defined (see section 8.5). For example:

```
500   DOS printer
510   Windows printer
```

\$U displays no useful information regarding the capacity of any tape drives connected to your computer.

4.10 \$V - Volume Maintenance Utility

\$V, the volume maintenance utility, is used to prepare diskette and data file volumes for use with Global System Manager. Before a volume can be used, it must be initialised and allocated a volume name by which it is known.

When you run \$V it displays a main menu and prompts for a function. To allow software compatibility with Global System Manager on other host operating systems, some options that appear are not available with Global System Manager (Windows NT). The functions listed are as follows:

Initialise is used to set up data file volumes (or subunits). You are prompted for the unit address, volume description, volume name and size. This option can also be used to initialise diskettes - you are prompted for the unit address and volume name.

Initialise and Verify performs the same function, but also verifies the volume (diskette or hard disk subunit) after initialising it, to check that each track is readable.

Format is not available for Global System Manager (Windows NT) configurations.

Format and verify is not available for Global System Manager (Windows NT) configurations.

Scratch domain is used to wipe all current data from a specified hard disk domain. **THIS FUNCTION SHOULD ONLY BE USED BY SYSTEM SUPERVISORS.**

Reformat faulty track is not available for Global System Manager (Windows NT) configurations.

Allocate alternate track is not available for Global System Manager (Windows NT) configurations.

Amend domain error map is not available for Global System Manager (Windows NT) configurations.

Set up special access option is for use by development programmers only.

List Directory is identical in effect to the \$F LIS option. It lists the files on a specified hard disk or diskette volume, or the volumes on a specified hard disk domain. You might want to do this before you perform one of the other operations, to avoid destroying valuable data.

Description Maintenance allows you to amend the Volume Description associated with a hard disk domain or sub unit.

To exit from the \$V command back to the ready prompt or main menu, key <CR> or <ESCAPE>.

Note that some of the \$V functions require exclusive access to a domain. On a multi-user configuration the Swap File (\$\$SWAPxx on logical unit \$SW) is permanently "IN USE" unless the \$STATUS GET instruction is used to gain exclusive control (see Chapter 5 of the Global System Manager Manual). The user File (\$\$USER on logical unit \$M, usually A01) is permanently "SHARED". In order to perform some of the above \$V functions on the domain accessed by server A, it is necessary to reload the Starter System from the BACRES diskette (see section 6.3.2).

There is some overlap between the \$F and \$V system commands. For example, both the \$F INI instruction and option 1 from the \$V menu can be used to initialise diskettes. Similarly, both the \$F DES instruction and option 11 from the \$V menu can be used to amend Volume Descriptions. \$F is described in Chapter 5 of the Global System Manager Manual.

4.10.1 Preparing New Diskettes

Only rarely are new diskettes already formatted correctly, needing simply to be initialized. Usually, factory-fresh diskettes will need

to be formatted. In particular, you should format a diskette if you are re-using one which has developed a bad sector. To do this, use the appropriate Windows command to format the diskette.

If you choose to verify the diskette, using function 2, it will be re-read, track-by-track, once it has been initialised, to check that every sector is readable.

When the unit prompt (\$78 UNIT:) appears you should mount the diskette to be processed and then key the unit address (or unit-id) of the drive the new diskette occupies, together with its volume-id (which can be up to 6 characters).

While the diskette is being initialised and verified, messages indicate the progress of the operation track by track. When both processes have finished the unit prompt re-appears so that you can create another volume if you want, or return to the \$V menu by keying <CR>. If you want to create several volumes with the same name (e.g. several backup volumes), you can reply <CR> to the volume prompt to use the volume-id you last specified.

NOTE THAT DISKETTE FORMATTING IS NOT SUPPORTED ON GLOBAL SYSTEM MANAGER (WINDOWS NT) CONFIGURATIONS.

4.10.2 Re-using Old Diskettes

You proceed in much the same way when you wish to re-use an old diskette. The only difference is that Global System Manager detects that there is already a valid volume present, and prompts to make sure that you really do intend to destroy the data it currently contains (which, of course, will be the effect of an initialize operation).

For example, it is possible to initialise and verify a diskette called WORK1, which was previously initialized as SAPROG. The special reply of "?" to the destroy prompt allows you to obtain a listing of the files occupying the volume to see whether it really should be overwritten. You should reply N to the prompt if you do not want to proceed.

On a configuration which includes several diskette formats (as displayed by the \$U command), it can take a considerable time for \$V to check that the target diskette does not contain a valid Global System Manager directory. \$V attempts to read the directory once for each diskette format that is supported on the selected drive. For example, if the configuration file includes the following formats on drive-0:

```
140 02A
142 02B
170 B3B
```

\$V will attempt to read the diskette using the volume format parameters for 02A, 02B and B3B. For example:

```
$78 UNIT:140 VOLUME ID:TEST
;
; $V normally attempts to read the diskette to check for
; a valid Global System Manager directory.
;
$78 DESTROY DISK-1 ON 170?:Y
```

This exhaustive checking can be bypassed by terminating the reply to the unit number prompt with <CTRL A> instead of the normal <CR>. For example:

```
$78 UNIT:140<CTRL A> VOLUME ID:TEST
$78 CONFIRM CORRECT DISK MOUNTED ON 1ST DISKETTE DRIVE (A:) - 140?:Y
```

DO NOT USE THIS OPTION UNLESS YOU ARE ABSOLUTELY SURE THAT THE CORRECT DISKETTE IS MOUNTED IN THE SELECTED DRIVE.

4.10.3 Preparing Data File Domains

You normally use function 1, Initialize, to prepare a new data file domain, since verification is usually not needed. You will have to set up a number of units on the disk starting with the lowest unit number, the domain unit. To find the unit addresses involved consult the unit description report produced by the \$U system command (see section 4.9).

The following example assumes that you want to set up three volumes named XXWORK, XXDATA and XXPROG on subunits B01, B02 and B03 of the data volume domain covered by unit B00. You must first establish the domain itself. You decide to name it XXDOM. The dialogue is the same as for initializing a diskette:

```
Please select a function:$V
.....
..... (Menu. Function 1 is Initialize)
.....
PLEASE SELECT A FUNCTION:1
$78 UNIT:B00 VOLUME:XXDOM INITIALISED
$78 UNIT:
```

Now you must allocate the three volumes. You have to specify how large they are so that Global System Manager can provide the correct amount of space for them from the Windows NT filing system.

The following example dialogue will allocate 2 Mbytes for XXWORK, 250 Kbytes for XXDATA, and 128000 bytes for XXPROG (where Mbyte = 1 Megabyte, 1048576 bytes; Kbyte = 1 Kilobyte, 1024 bytes.):

```
$78 UNIT:B01 VOLUME DESCRIPTION:EXAMPLE 2M WORK VOLUME
VOLUME:XXWORK SIZE:2M 2098176 INITIALISED
$78 UNIT:B02 VOLUME DESCRIPTION:EXAMPLE 250K DATA VOLUME
VOLUME:XXDATA SIZE:250K 257024 INITIALISED
$78 UNIT:B03 VOLUME DESCRIPTION:EXAMPLE PROGRAM VOLUME
VOLUME:XXPROG SIZE:128000 129024 INITIALISED
$78 UNIT:<CR>
.....
..... (Menu)
.....
Please select a function:
```

The volumes are now set up and can be used like any other data volumes. The value displayed before the word INITIALISED is the size actually allocated for the volume - usually slightly larger than the size requested, since each volume will occupy a whole number of virtual tracks.

Volume Descriptions are described in section 4.10.10.

Note that you can key <CR> to the SIZE: prompt, in which case the size last specified will be used. **A SIZE OF 0 IS NOT ALLOWED FOR A DISCRETE DATA FILE DOMAIN (e.g. volume format T259Z).** Note that the special

reply of 0 (zero) causes the maximum amount of contiguous space remaining on an Integrated Data File Domain (e.g. volume format P259Z) to be allocated to the volume.

When allocating a new sub-volume on a Discrete Data File domain, the following message is displayed:

```
Allocation in progress, please wait...
```

If the sub-volume initialisation does not complete successfully (e.g. if <CTRL W> is used to abort \$V) a dummy Windows sub-volume data file may exist in the domain directory (e.g. GSMA00) occupying un-reusable hard-disk space. To reclaim the space, delete this file using an appropriate Windows utility.

4.10.4 Allocating Additional Volumes

You can use \$V to set up new volumes, providing that some remain to be allocated and there is spare data space available. You can check the state of the domain either by using the List Directory function on the \$V menu or by keying its address in response to the unit prompt, and ? to the subsequent volume or volume description prompts. The resulting display shows the units and volumes already allocated, the number of subunits available, and the amount of free space remaining.

The allocation of a new volume takes place just as explained in the previous section. For example, to set up XXNEW with 1.5 Mbytes of storage:

```
$78 UNIT:B04 VOLUME DESCRIPTION:2ND WORK VOLUME (1.5MB)
VOLUME:XXNEW SIZE:1.5M 1573888 INITIALISED
$78 UNIT:
etc, etc.
```

If you mistakenly key the address of a volume which has already been allocated the destroy prompt appears. You should key N to return to the unit prompt:

```
$78 UNIT:B03 VOLUME DESCRIPTION:2ND WORK VOLUME (1.5MB)
VOLUME:XXNEW SIZE:1.5m
$78 DESTROY XXPROG?:N
$78 UNIT:
```

Note that you can use the ? response to the VOLUME DESCRIPTION or VOLUME prompts to examine the contents of a diskette or hard disk volume, as well as a domain. The display produced is the same as that which appears when you key ? in response to the destroy prompt.

If you want to allocate an additional spool unit you must prefix the size with an S to indicate its status. You will then be prompted for the "allocation". You would normally reply <CR> to accept the default shown. For example:

```
$78 UNIT:B10 VOLUME DESCRIPTION:SECONDARY SPOOL UNIT
VOLUME ID:SPOOL2 SIZE:S3M
$78 ALLOCATION ( 61K):<CR> 3150336 INITIALISED
```

4.10.5 Deallocating a Hard Disk Volume

To deallocate a volume previously allocated use the initialize function as above, but reply <CTRL A> to the volume description or volume prompts. The volume will erase all the data on it. Key Y to

continue, or N or <CR> to avoid deallocating the volume and losing data you want to keep. For example:

```
$78 UNIT:B03 VOLUME DESCRIPTION:<CTRL A>
$78 DEALLOCATE XXNEW?:Y DEALLOCATED
$78 UNIT:
```

Note that you can use the ? response to the DEALLOCATE prompt to examine the contents of a hard disk volume as a final check before deallocating it. The display produced is the same as that which appears when you key ? in response to the destroy prompt.

4.10.6 Recovering a Faulty Track on a Hard Disk

This option is not available for Global System Manager (Windows NT) configurations.

4.10.7 Preparing Work Volumes

Many software modules need to use special volumes, known as work volumes, when reorganizing data etc. These volumes, which can be held on any disk of sufficient capacity, have names of the form xxWORK, where xx represents the 2 character abbreviated form of the program name. Although most Global software modules automatically set up such volumes when required, in some cases you will be required to do this manually.

Work volumes are usually named \$\$WORK. The \$ characters have the special property that they will match the request for any two other characters. This means that this volume can be used as a work volume by any Global software module without having to be renamed. For example, a Sales Ledger module might require a work volume called SLWORK. If the unit assignment in its menu entry tells it to look for this volume at the \$\$WORK unit address it will not signal an error when it finds the volume \$\$WORK rather than SLWORK.

If you want to allocate a work unit you must prefix the size with a W to indicate its status as a work unit. You will then be prompted for the "allocation". You would normally reply <CR> to accept the default shown. For example:

```
$78 UNIT:B10 VOLUME DESCRIPTION:A WORK UNIT
VOLUME ID:$$WORK SIZE:W3M
$78 ALLOCATION ( 61K):<CR> 3150336 INITIALISED
```

4.10.8 Amending a Domain Error Map

This option is not available for Global System Manager (Windows NT) configurations.

4.10.9 Listing a Directory

The \$V List function displays a volume or domain listing in the same format as the listing produced by the \$F LIS instruction.

The format of a domain listing produced by the List function in versions 8.0, and later, of Global System Manager differs from that produced by earlier versions. The Volume Description (see section 4.10.10) of each sub-volume is displayed instead of the "start, size and protection" information. To produce a domain listing which includes the "start, size and protection" information for each subunit, terminate the unit number with <CTRL A> instead of the usual <CR>.

For example:

```
$78 UNIT:600
VOLUME SYSDOM ON 600 ACCESS OPTION 1 11/12/90 11.53.49
FIRST DOMAIN (GLOBAL SYSTEM MANAGER DEVELOPMENT)
UNIT VOL-ID DATASIZE DESCRIPTION
601 SYSRES 3150336 V8.0 GLOBAL SYSTEM MANAGER VOLUME
602 SYSDEV 1577472 V8.0 GLOBAL COBOL PROGRAMMING KIT
603 PSDATA 2101760 V8.0 GLOBAL COBOL PRODUCT SUPPORT
604 SYSLOG 791040 V8.0 SYSTEM EVENT LOGGING VOLUME
etc.
```

```
$78 UNIT:600<CTRL A>
VOLUME SYSDOM ON 600 ACCESS OPTION 1 11/12/90 11.57.14
FIRST DOMAIN (GLOBAL SYSTEM MANAGER DEVELOPMENT)
UNIT VOL-ID DATASIZE TOTAL START
601 SYSRES 3150336 3162112 49152
602 SYSDEV 1577472 1589248 3211264
603 PSDATA 2101760 2113536 4800512 PROTECTED
604 SYSLOG 791040 802816 6914048
etc.
```

4.10.10 Volume Description Maintenance

Global System Manager allows a 50 character Volume Description to be associated with each data file domain and sub-volume. An area of the index header (see section 4.10.11) is utilised to hold the table of Volume Descriptions.

The Description Maintenance function allows the 50 character long Volume Description for a domain or subunit to be amended. The current Volume Description, or spaces if a description is not present, is displayed and may be overwritten by a new 50 character text string. If there is insufficient space in the volume description table for a particular subunit, the following message will appear:

```
NO ROOM FOR DESCRIPTION - RE-INITIALISE DOMAIN
```

This message will only appear for subunits with a high unit number on a domain that has been initialised using a version of Global System Manager prior to V7.0.

Note that if the \$V Initialise function is used under Job Management and there is insufficient space in the volume description table for a particular subunit the VOLUME DESCRIPTION prompt always appears, although the reply is subsequently ignored. This is necessary to ensure a predictable and consistent Job Management dialogue.

The Initialise function contains another special feature which is only enabled when \$V is used under Job Management. If the reply to the VOLUME DESCRIPTION prompt is six characters or less and \$V is executing under Job Management, the reply (supplied by the job) is used as the volume-id and the subsequent VOLUME prompt, which normally appears, is suppressed. This feature has been incorporated into \$V to ensure a compatible dialogue for jobs developed prior to Global System Manager V7.0.

Note also that Volume Descriptions are only recognised by versions 7.0, and later, of Global System Manager. Any program generating job dialogue must check the Global System Manager version before attempting to amend a Volume Description.

Finally, the first example shown in section 4.10.3 over-simplified the use of \$V when initialising domains. If a domain is being initialised for the first time, \$V prompts for the volume i.d. only. If however, a domain is being re-initialised, \$V prompts for both a volume i.d. and a volume description. For example:

```
Please select a function :1
$78 UNIT:250 VOLUME ID:DISK-2 INITIALISED
$78 UNIT:250 VOLUME DESCRIPTION:2ND 2.5GB HARD DISK
VOLUME ID:BIGDSK
$78 DESTROY DISK-2 ?:
```

Important note: The Volume Descriptions for Discrete Data File domains (e.g. volume format T259Z) are held in the domain header file rather than being associated with individual sub-volume data files. If a sub-volume data file is copied to a data directory using a Windows command it will automatically inherit the Volume Description, if any, associated with the corresponding sub-volume number. The same effect will occur if a sub-volume data file is "renumbered" using a Windows utility.

4.10.11 Global System Manager (Windows NT) Data File Format

A data file domain is a Windows NT directory specified by the corresponding Registry definition (see section 8.2.1), within which the sub-volumes are created. For example:

```
DDF0 C:\GSM\GSMA00
```

The unit addresses for sub-volumes of this data file are A00 upwards. The name of the directory is free format, the example above shows the suggested convention only. The unit addresses Ann are actually determined by the data definitions in the configuration file. Each sub-volume of associated data is contained within a separate file, the internal structure of the file being in Global format. The name of each file has a fixed part and a variable part. For example, the contents of the data file directory created in section 4.10.3 would look like this:

```
00XXDOM.SVL
01XXWORK.SVL
02XXDATA.SVL
03XXPROG.SVL
```

The suffix SVL is mandatory and is used to recognise Global data files. The number (00 to 03 here) gives the unit address offset from the domain unit address. The rest of the file name corresponds to the name specified for the unit by \$V or \$F.

Note that there is a file with the same unit address as the data file domain itself (00XXDOM.SVL above). This is the index header file which **MUST** exist. It contains initialisation data and the long volume descriptions displayed by \$F.

When Global System Manager is NOT in use it is possible to rename or copy these sub-volumes using standard Windows commands. The new unit address and volume name will be used the next time the relevant Global Client or Global Server is run. The unit addresses must be unique otherwise the later volume will be ignored (and it may not be clear which file is ignored). Similarly sub-volumes can be copied or moved to different data file domains (or archived), but the same rules

apply. If a sub-volume is given a different unit address, however, the long volume description is not moved to the new address, as this is stored in the index header 00vvvvvv.SVL (00XXDOM.SVL above).

5. The Graphical User Interface (GUI)

This chapter describes the Graphical User Interface (GUI) that is provided as a standard component of all Global System Manager (Windows NT) configurations. Those users familiar with the Global Windows Workstation (GUI) product will recognise the similarity between the GUI product and the Global System Manager (Windows NT) GUI sub-system.

This chapter only describes the "front-end" interface to the Global Client. The restricted "front-end" of the Global Server is fully described in section 6.4.

IMPORTANT NOTE: The GUI sub-system is extremely configurable. The appearance (e.g. font-size, colours etc.) and user-defined options (e.g. keyboard and mouse usage) can be easily modified. Consequently, this chapter only describes the overall "look-and-feel" aspects of the GUI. Appendix F and, to a lesser extent, section 8.3.1 describe the large number of options that can be easily altered to modify the precise behaviour of the GUI.

5.1 GUI Overview

All standard Global System Manager (Windows NT) Client configurations contain a standard, Microsoft-compliant Graphical User Interface (GUI). This component transforms the Global Menu Handler and the Speedbase Presentation Manager into true GUI Window Managers. The GUI sub-system of the Global System Manager (Windows NT) product also allows the mouse to be used for a variety of input functions.

The GUI sub-system interprets Speedbase windows, transforming them into standard Microsoft-compliant objects. The interpretation assumes that the Speedbase applications are written to a number of coding standards (that are beyond the scope of this documentation). All standard Speedbase windows are interpreted acceptably - it is only frames that use the screen in a non-standard way (e.g. using special colours) that may not be interpreted correctly by the GUI sub-system. Additionally, Global System Manager menus displayed by the Menu Handler are interpreted and transformed by the GUI. Other Global programs (e.g. Global utilities and Global 2000 applications) run in a terminal emulator mode but with some extensions to provide a Windows "look-and-feel" (e.g. to allow the use of the mouse in most circumstances).

The GUI sub-system includes a toolbar that provides a series of icons for the following functions:

- concurrent partition switching;
- cut-and-paste to the Windows clipboard;
- Speedbase function by emulation;
- re-display numerical information in graphical format;
- initiation of another Windows application.

5.2 Global System Manager Customisation

Global System Manager (Windows NT) is pre-configured to use the GUI sub-system. Section 8.3.1 and Appendix F describe the various

customisations that apply directly to this sub-system. This section describes those Global System Manager customisations that apply indirectly to the GUI sub-system.

5.2.1 Menu Customisation

The "Select default <CR> line?" parameter in the "Amend menus" option of Menu Maintenance, should be set to "Y" to ensure that one line is always highlighted.

Important note: The other specific menu display options, modified using the Menu Maintenance "Amend display parameters" option, that are mandatory for early versions of the Global Windows Workstation product, are not required for the Global System Manager (Windows NT) GUI sub-system: The menus do not have to be displayed in SAA style and the "display title" option does not have to be displayed "inside the box".

5.2.2 Type-ahead Buffer Customisation

The standard type-ahead length (see section 8.3.1.1) should be adequate for most purposes. A relatively large type-ahead buffer is required since paste operations may suffer from missing characters if this buffer is too small.

5.2.3 Display Buffer Customisation

The default display buffer length (see section 8.3.1.1) should be adequate for most purposes.

5.2.4 Licensing

The "GUI licence" is not required for Global System Manager (Windows NT) configurations.

5.2.5 Colour Customisation

The default Global System Manager colour combinations predominantly use grey as the background colour to provide a Windows-like appearance. All Global utilities and Global 2000 programs will use these colours. The default colours can be customised by modifying the various Registry values described in section F.1.

5.2.6 Speedbase TAP Customisation

The Speedbase TAP for the GUI sub-system, T>711, must NOT be customised. The function keys must not be modified since their values are assumed to be fixed by the GUI sub-system. For example, choosing the Speedbase Help option from a menu or the toolbar will simulate either the <F1> or <F8> keystroke (see section F.2.9), regardless of the value that has been customised in the Speedbase TAP to produce help.

The colour combinations must NOT be modified since each Speedbase field type is indicated by a unique colour sequence, and if such a sequence is altered, the field type will not be interpreted correctly.

5.3 Using the Graphical User Interface (GUI)

The initial appearance of the GUI sub-system depends on the MainFramePosition value in the Registry (see section F.2.13). By default this value is not set up in the Registry so the GUI sub-system will utilise the whole screen.

5.3.1 The Terminal Type

Any of the GUI Terminal Types described in section 8.3.1 can be used with the GUI sub-system.

5.3.2 Functionality

It is possible to use exactly the same keystrokes as you would use on a character terminal. However, there are also a number of places where the mouse can be used instead.

The functions available with the mouse depend on whether the screen is being interpreted into full windows (e.g. when running a Global 3000 application) or the program is simply functioning as a terminal emulator (e.g. when running a Global 2000 application).

5.3.2.1 Windows Mode

Speedbase programs and menus (if displayed with the correct parameters) are displayed using standard Microsoft Windows. This mode can be recognised by the use of proportional sans serif fonts for text and proper windows borders instead of boxes.

The mouse can be used as an alternative to the keyboard in many circumstances:

- You can use a single click of the mouse to select an item from a menu (if interpreted as a window) or a pop menu;
- You can move to another line within the scrolled area by a single left click, or select the current line by a double click;
- You can click above or below the "thumb" on the scroll bar to move up or down a page;
- You can click on the arrows at the top and bottom of the scroll bar to move a single line up or down;
- You can drag the "thumb" to the top or bottom of the scroll bar to move the selected line to the top or the bottom of the list;
- You can drag a window to another position by positioning the mouse on the title (provided the window has one!) and dragging it with the left button. Note that the re-positioning is not permanent but only remains for the current invocation of the window. The information revealed underneath the window will be what was last displayed there, and it is possible that this could be out of date though in practice this does not appear to happen.

Note that you cannot use the mouse to select between different input fields. The GUI sub-system displays the Global System Manager Menu Handler command box as a Windows dialogue box. This dialogue box contains an edit box, which will accept up to 8 characters, and two buttons, "OK" and "Cancel". You can key in the required program name in the edit box and accept it either by clicking on the "OK" button or keying <CR>; or quit the command box either by clicking on the "Cancel" button or keying <ESC>.

Note that the Global System Manager Menu Handler does not generate the command box when "\$" is keyed, so the <F1> key MUST be used to obtain the command box.

Note also that the technique of terminating the program name with <CTRL A> to change the \$P or \$CP assignment cannot be used when the edit box appears. If you wish to emulate the <CTRL A> functionality of the menu handler one of the advanced options described in sections 5.3.3.4 or F.2.4 must be enabled when the Menu handler command box appears.

If a selected menu entry has an associated password, a similar dialogue box will appear.

5.3.2.2 Terminal Emulation Mode

This is used when running non-Speedbase programs such as Global 2000 applications and Global System Manager utilities. It is also used for menus if the standard menu handler is not employed. This mode can be recognised by the use of a non-proportional font with serifs.

If the left mouse button is clicked, the "word" under the mouse is returned as a response to the executing program followed by a <CR> character (via the type-ahead buffer).

Character strings on the baseline, displayed by the BASEL\$ subroutine (the first word on the baseline must be "Key" and other fields must be delimited by commas) are treated specially. Clicking anywhere between a pair of commas returns the first character of the first word after the leading comma if it is an upper-case letter. A <CR> character is returned if the mouse is clicked over the "<CR>" string. An <ESC> character is returned if the mouse is clicked over the "<ESC>" string.

If the mouse is clicked over the "up" within the "up/down" string the character generated by the <UPARROW> key is returned to the application. If the mouse is clicked over the "down" within the "up/down" string the character generated by the <DOWNARROW> key is returned to the application.

In this context, a "word" is defined as any string of alphanumeric characters (where "\$" is treated as an alphanumeric character).

This mechanism allows mouse selection in many cases:

- From a baseline prompt, by clicking on the appropriate word;
- From a menu, by clicking on the line number;
- To accept the default displayed, or to select a single character response from a set of options displayed as part of the prompt;
- To select a code from a list by clicking on it (e.g. an employee number in Global 2000 Payroll).

5.3.3 Menu Options

There are five drop down menus which incorporate entries to support partition swapping, cut and paste, Speedbase function keys and help. Most of these entries have an associated icon on the toolbar which gives one touch access to each of the options.

5.3.3.1 Window Menu

The Window menu allows you to select another partition, either by choosing the partition number directly or by stepping backwards or forwards through each partition. Note that the partition currently

being displayed is greyed out (i.e. it cannot be selected) as are partitions which are not defined in the configuration file. For example, if four partitions are configured, and P2 is selected, then the entries for partitions 2, and 5 to 9 are greyed out.

5.3.3.2 Edit Menu

The Edit menu is used to access the cut and paste facilities (see section 5.3.6).

5.3.3.3 Functions Menu

The Functions menu includes entries which send important character/function key sequences to Global System Manager (i.e. they act as an alternative to the keyboard for a limited number of functions).

5.3.3.3.1 Non-Speedbase Mode

When a non-Speedbase application is displayed three entries (i.e. Continue, Quit and Graph) are always available. Choosing the Continue and Quit entries sends the <CR> and <ESC> characters to Global System Manager, respectively. The Graph option initiates other Windows programs which convert tabulated numerical data into a graphical representation (see section 5.3.8). Another entry, the Program option, may also be available depending on whether a [programs] section has been set up in the GLOBAL.INI initialisation file (see Appendix K). This option allows other Windows programs to be initiated by the Global Client (see section 5.3.7).

5.3.3.3.2 Speedbase Mode

When a Speedbase application is displayed all eleven entries which generate the following character/function key sequences are potentially available:

Option	Char./function	Conditions
Continue	Page Down End available TAB <CR>	Speedbase ENQ mode Speedbase DSP and ADD modes, End Other Speedbase modes, TAB available All other times
Quit	ESC	Always
Enquire change index	F6	Always, used to enter enquiry mode and
Search	F1 available (i.e. when a >" would be displayed at the bottom right hand corner of the frame on a text screen)	Only enabled when a search is
Insert function is available	F5	Only enabled when the insert
Delete function is available	F7	Only enabled when the delete
F1 available or when an	F1	Enabled when the UF1 function is

		"F1 " string appears as part of a baseline message
F2	F2	Enabled when the UF2 function is available or when an "F2 " string appears as part of a baseline message
F3	F3	Enabled when the UF3 function is available or when an "F3 " string appears as part of a baseline message

The Program option is used to initiate other Windows programs (see section 5.3.7).

The Graph option initiates the graphics utilities (see section 5.3.8).

5.3.3.4 Options Menu

The Options menu has four entries.

5.3.3.4.1 Extended Command Box Option

This option enables/disables the extended command box. The command box appears when the <F1> function key is keyed at a Global System Manager menu. Normally this will allow an 8 character name to be keyed to initiate a program (e.g. \$INSPECT). Sometimes a <CTRL A> terminator is required to run the program from a different \$CP or \$P unit. The extended command box allows the terminator to be selected, either <CR> or <CTRL A>.

5.3.3.4.2 Toolbar Option

This option toggles the Toolbar on and off.

5.3.3.4.3 Status Bar Option

This option toggles the Status Bar on and off.

5.3.3.4.4 DisplayLog

See the Global Windows Workstation Notes for further details.

5.3.3.5 Help Menu

The help menu has five entries that allow you to select:

- Global System Manager help (i.e. emulate <SYSREQ> H);
- Speedbase help (i.e. emulate <F8>). Note the Global System Manager help and Speedbase help entries are mutually exclusive;
- Refresh screen. This menu entry re-displays all windows within the GUI sub-system in their original order and position;
- Non-GUI display option which shows a standard character based version of the current screen contents;
- An "about box" which displays the "Global Client" version/variant (see section 1.5.4) and the Global System Manager Contract Protection Message and Serial Number details (see section 3.2).

5.3.4 The Toolbar

The toolbar is a row of icons each of which is associated with a drop down menu entry (i.e. using the toolbar is a quicker method of selecting such an entry since it requires only one mouse click). Most options on the drop down menus are accessible via a toolbar icon. The associations for the icons (from left to right) are as follows:

Menu	Entry
Window	Partition 1
Window	Partition 2
Window	Partition 3
Window	Partition 4
Window	Previous
Window	Next
Edit	Mark
Edit	Copy
Edit	Paste
Functions	Continue
Functions	Quit
Functions	Enquire
Functions	Search
Functions	Insert
Functions	Delete
Functions	F1
Functions	F2
Functions	F3
Functions	Program
Functions	Graph
Help	Global System Manager help
Help	Speedbase Presentation Manager help

5.3.5 The Status Bar

The status bar is positioned at the bottom of the Global Client frame window and contains five information panes. The status bar can be enabled/disabled using the Options menu (see section 5.3.3.4).

The following sections describe each of the frames (in left-to-right order).

5.3.5.1 The Status Line Pane

This is the largest pane which will automatically be re-sized if the Global Client frame window is re-sized. It usually contains the Global System Manager status-line text, but is also used to display Speedbase error and Speedbase base-line messages.

5.3.5.2 The Speedbase Frame Pane

This pane, which has been introduced with V2.1 of the GUI sub-system, is only used in Speedbase mode. It contains the name of the current

Speedbase frame, which is displayed as part of the Speedbase title line on a non-GUI, text screen.

5.3.5.3 The Speedbase Mode Pane

This pane is only used in Speedbase mode. It contains the current Speedbase mode (e.g. ENQ), which is displayed as part of the Speedbase title line on a non-GUI, text screen.

5.3.5.4 The CAPS Lock Indicator Pane

This pane is used to display the current state of the keyboard CAPS lock key.

5.3.5.5 The NUM Lock Indicator Pane

This pane is used to display the current state of the keyboard NUM lock key.

5.3.6 Cut and Paste

The "cut and paste" facilities are selected from the "Edit" drop-down menu (or from the Mark, Copy or Paste icons on the toolbar). The "Edit" drop-down menu contains 3 options "Mark", "Copy" and "Paste" which are selectively highlighted/dimmed to indicate whether a particular menu option is available.

5.3.6.1 Mark Option

On selecting the mark option, the emulator is put into mark mode and a small rectangle (the tracker) is displayed at the top left hand corner in the child window that currently has the focus. Placing the tracker on this window means that it is possible to copy text from any Speedbase frame, regardless of whether it was the last one displayed by the application. Note that the tracker's operation is restricted to one window (i.e. it is only possible to copy information from one frame at a time) and that the mark option does not work on Global System Manager menus. In the unlikely event that a Global System Manager menu needs to be copied then run any command that displays the 80 by 24 text screen (e.g. READY) and copy from that window.

The tracker is displayed as a rectangle with a one pixel black border with re-sizing handles placed at each corner and on the mid-point of each line. The tracker can be moved, by holding the left-mouse button down whilst the mouse cursor is within the tracker rectangle and dragging the entire rectangle to the desired position, and re-sized using a similar dragging operation but this time pressing the left mouse button whilst the mouse cursor is on one of the re-sizing handles. The standard re-sizing operations are supported: One dimensional sizing is achieved by using the mid-point handles, top and bottom lines for vertical size changes and left and right for horizontal changes, and two dimensional sizing is carried out by using the corner handles. The mouse cursor changes shape (the standard Windows cursor shapes are used) according to its position over the tracker to aid re-sizing and moving operations.

The mark option is available only if the emulator is not currently in mark mode. Mark mode is cleared either by choosing the copy option or by aborting the mark option by keying <ESC>.

Note that the keyboard (except the <ESC> key) and icon are disabled when the emulator is in mark mode, primarily so that the child window containing the tracker does not disappear.

5.3.6.2 Copy option

On selecting the copy option, the current Clipboard's text item is deleted and the text enclosed by the tracker is copied to a memory area which is made available to the Clipboard. Note that the text is passed as a series of lines, each with a <CR> <LF> character combination to terminate each line. Note also that the text copied cannot be appended to text already resident in the Clipboard.

The text enclosed by the tracker on a Global System Manager screen is well defined since it is displayed using a fixed font. However, on Speedbase screens the use of a proportional font for labels means that the text copied will be unpredictable when the tracker rectangle cuts a label.

The copy option is only available when the emulator is in mark mode. Note that the copy option can also be invoked by clicking on the "Continue" button when the emulator is in mark mode.

5.3.6.3 Paste Option

The paste option takes the current Clipboard's text item and sends it to Global System Manager via the shared memory driver (i.e. as though it had just been typed on the keyboard). For each line in the text a <CR> is sent to Global System Manager but the associated <LF> is ignored. Note that a large type-ahead buffer (e.g. 2000) is required otherwise text may be lost when it is pasted.

The paste option is available if there is a text item in the Clipboard and the emulator is not in mark mode (it is important that no characters are sent to Global System Manager when the emulator is in mark mode (see section 5.3.6.1)).

5.3.7 Program Function

The program function enables the user to initiate other Windows applications via a single click on the toolbar (or selecting a menu entry). The Windows application that is invoked is determined by a list in the GUI sub-system initialisation file, GLOBAL.INI, which associates Windows application names to Global System Manager application names (i.e. either a Speedbase frame name or a Global Cobol program name). More than one Windows application can be associated with a Global System Manager application, in which case a dialogue box will be displayed containing a drop-down list box displaying the associated Windows applications. The user can then choose which Windows application to run. If the Global System Manager application name is an empty string then this entry can be associated with any Global System Manager application not present in the list. For example, the menu handler, \$MH, is an unlikely choice for an association so when the custom exec button is clicked at a menu the general purpose list will be displayed.

Note that the contents of the current screen or frame are written to a text file, SCREEN.TXT, in the current directory, before invoking the selected Windows application.

5.3.8 The Graph Function

The graph function utilises two Windows programs which convert and display tabulated numerical data into a graphical representation. It is a multi-stage process which proceeds as follows:

1. The current screen or frame contents are written to a text file, SCREEN.TXT, in the GRAPHS sub-directory (see section D.2.1);
2. The GUI sub-system invokes the conversion program, GSMCONV.EXE, which converts the text file to a data file, _graph. The template file, GSMCONV.TLT, provides the parameters for the conversion;
3. If multiple template records have been set up for the current screen then a dialogue box will appear prompting for the particular template record required;
4. Finally, the conversion program invokes the graph viewer program, GSMGRAPH.EXE, which reads the _graph data file and displays the graph. The template file, GSMCONV.TLT, provides the key to any graphics data conversion. It should be modified, using the syntax described in Appendix H, if the graphical representation of a new screen or frame is required.

5.3.9 Restrictions

There are a number of facilities not currently supported by the GUI sub-system:

- You must not attempt to customise the colours used by Speedbase as the GUI sub-system relies on particular values to identify the type of field. We have tried to select colour combinations for the GUI that are unlikely ever to be used in practice (e.g. green on cyan) but if you use one of these combinations it is likely to confuse the display. The colour combinations we have used and which are therefore reserved are:
 - yellow and cyan;
 - yellow and green;
 - yellow and magenta;
 - yellow and white;
 - blue and red;
 - blue and magenta;
 - blue and black;
 - cyan and green;
 - magenta and red.
- The Speedbase function key customisations must not be changed;
- The mouse cannot be used to select a particular input field.

6. Windows Utilities

This chapter describes the Windows utilities distributed with Global System Manager (Windows NT) on the BACNAT media.

The first section describes GLOBAL.EXE, the Windows program that starts a Global System Manager (Windows NT) Client session. The following sections document the various Windows utilities that are available to initiate Global System Manager (Windows NT) Servers.

The penultimate section describes the GLDFMAIN.EXE utility that is used to allocate the Global System Manager simulated hard-disk volumes.

The final section briefly describes the two batch files that are used to install Global System Manager.

The Global Registry Editor, GLREGED.EXE, is fully described in Chapter 7.

6.1 Contents of the BACNAT Media

The BACNAT media, supplied with Global System Manager (Windows NT) contains the following executable programs and batch files in a compressed format:

GLOBAL.EXE	Windows utility to initiate a Global System Manager (Windows NT) Client (see section 6.3). This utility is analogous to the GSMLOAD.EXE utility supplied with Global System Manager (MS-DOS) configurations;
GLSERVER.EXE	Windows utility to initiate a single Global System Manager (Windows NT) Server (see section 6.4). This utility is slightly analogous to the GSM.NLM NetWare Loadable Module supplied with Global System Manager (Novell NetWare) configurations;
GLSSTART.EXE	Windows utility to initiate all the Global System Manager (Windows NT) Servers that have been configured, in the Registry, on a particular computer (see section 6.5). This utility has no counterpart in Global System Manager (MS-DOS) configurations;
GLDFMAIN.EXE	Windows utility to maintain (i.e. create) Discrete Data File Domains and Integrated Data Files (see section 6.6). This utility is analogous to the ALLOCATE.EXE utility supplied with Global System Manager (MS-DOS) configurations;
GLREGED.EXE	Windows utility to maintain the Global sections of the Windows Registry. This important utility, which has no counterpart in Global System Manager (MS-DOS) configurations, is fully described in Chapter 7;
GLINSSRV.BAT	Install Global System Manager on the "Master Server";
GLINSCLI.BAT	Install Global System Manager on a "Local SYSRES".

Note that these utilities cannot be run from the BACNAT media directly - they can only be run from the Global System Manager directory after a successful installation (see section 2.2).

6.2 Starting Global Utilities under Windows NT and Windows 95

The various utilities described in this chapter must be started using one of the standard methods supported by the host operating system. For both Windows NT and Windows 95 there are a variety of methods available to initiate programs. The methods available depend on the version of Windows you are using. This section describes the recommended methods of running the utilities supplied with Global System Manager.

6.2.1 Windows NT V3.51

Windows NT V3.51 uses the Windows 3.1 style front end. Most programs are simply started from Program Manager but other methods are available.

6.2.1.1 Starting From an Installed Icon

The Global System Manager (Windows NT) Setup utility (see section 2.2) adds program items (each program item appears as an icon) to a Program Group (which appears as a window) usually labelled "Global System Manager" (see section 2.2.2.4). A program can be run by double clicking on its associated icon. This is the best technique to use since all the command line parameters required by a particular utility will have been configured correctly by the Setup utility (see section 2.2).

Important note: The icons for GLREGED.EXE (see Chapter 7) and GLDFMAIN.EXE (see section 6.6) will only be available if the "Advanced Installation" option has been used (see section 2.2.2.3).

6.2.1.2 Starting From the Run dialogue box

The Windows Program Manager allows a program to be run by simply entering its name together with the required command line parameters. This is achieved by choosing the "Run" entry from the "File" menu in the Program Manager window. On choosing this option the "Run" dialogue box will appear which prompts for the command line. This technique is not recommended because most utilities supplied with Global System Manager require a full set of command line options to be supplied.

6.2.1.3 Starting From the MS-DOS Command Prompt

Windows programs can be run directly from the MS-DOS command prompt by entering the program name and the required command line parameters. This technique is not recommended because most utilities supplied with Global System Manager require a full set of command line options to be supplied.

6.2.1.4 Starting From the Windows File Manager

Any program can be run via the Windows File Manager by double clicking on the program file name (e.g. GLDFMAIN.EXE). Note that no command line parameters can be specified using this technique so only the Global Data File Maintenance utility (see section 6.6) and the Global Registry Editor utility (see Chapter 7) can be started from File Manager. All the other utilities described in this chapter will fail with an "Insufficient Parameters" error if an attempt is made to start it from File Manager.

6.2.2 Windows NT V4.0

Windows NT V4.0 uses the Explorer front end. Most programs are simply started from the installed Shortcut but other methods are available.

6.2.2.1 Starting From the Installed Shortcut

The Global System Manager (Windows NT) Setup utility (see section 2.2) adds Shortcuts (each shortcut appears as a menu entry) to a Program menu entry usually labelled "Global System Manager" (see section 2.2.2.4). A program can be run by clicking on its associated menu entry. This is the best technique to use since all the command line parameters required by a particular utility will have been configured correctly by the Setup utility (see section 2.2).

Important note: The shortcuts for GLREGED.EXE (see Chapter 7) and GLDFMAIN.EXE (see section 6.6) will only be available if the "Advanced Installation" option has been used (see section 2.2.2.3).

6.2.2.2 Starting From the Run dialogue box

The Windows Explorer front end allows a program to be run by simply entering its name together with the required command line parameters. This is achieved by choosing the "Run" entry from the "Start" menu. On choosing this option the "Run" dialogue box will appear which prompts for the command line. This technique is not recommended because most utilities supplied with Global System Manager require a full set of command line options to be supplied.

6.2.2.3 Starting From the MS-DOS Command Prompt

Windows programs can be run directly from the MS-DOS command prompt by entering the program name and the required command line parameters. This technique is not recommended because most utilities supplied with Global System Manager require a full set of command line options to be supplied.

6.2.2.4 Starting From the Windows Explorer

Any program can be run via the Windows Explorer by double clicking on the program file name (e.g. GLDFMAIN.EXE). Note that no command line parameters can be specified using this technique so only the Global Data File Maintenance utility (see section 6.6) and the Global Registry Editor utility (see Chapter 7) can be started from Windows Explorer. All the other utilities described in this chapter will fail with an "Insufficient Parameters" error if an attempt is made to start it from Windows Explorer.

6.2.3 Windows 95

Windows 95 uses the Explorer front end. Most programs are simply started from the installed Shortcut but other methods are available.

6.2.3.1 Starting From the Installed Shortcut

The Global System Manager (Windows NT) Setup utility (see section 2.2) adds Shortcuts (each shortcut appears as a menu entry) to a Program menu entry usually labelled "Global System Manager" (see section 2.2.2.4). A program can be run by clicking on its associated menu entry. This is the best technique to use since all the command line parameters required by a particular utility will have been configured correctly by the Setup utility (see section 2.2).

Important note: The shortcuts for GLREGED.EXE (see Chapter 7) and GLDFMAIN.EXE (see section 6.6) will only be available if the "Advanced Installation" option has been used (see section 2.2.2.3).

6.2.3.2 Starting From the Run dialogue box

The Windows Explorer front end allows a program to be run by simply entering its name together with the required command line parameters. This is achieved by choosing the "Run" entry from the "Start" menu. On choosing this option the "Run" dialogue box will appear which prompts for the command line. This technique is not recommended because most utilities supplied with Global System Manager require a full set of command line options to be supplied.

6.2.3.3 Starting From the MS-DOS Command Prompt

Windows programs can be run directly from the MS-DOS command prompt by entering the program name and the required command line parameters. This technique is not recommended because most utilities supplied with Global System Manager require a full set of command line options to be supplied.

6.2.3.4 Starting From the Windows Explorer

Any program can be run via the Windows Explorer by double clicking on the program file name (e.g. GLDFMAIN.EXE). Note that no command line parameters can be specified using this technique so only the Global Data File Maintenance utility (see section 6.6) and the Global Registry Editor utility (see Chapter 7) can be started from Windows Explorer. All the other utilities described in this chapter will fail with an "Insufficient Parameters" error if an attempt is made to start it from Windows Explorer.

6.3 GLOBAL.EXE - Start a single Global Client

GLOBAL.EXE is the Windows program which allows a user to initiate a Global Client session. This program is usually initiated from the Global Client icon or shortcut configured by the installation program (see section 6.2) but can be started from the Windows Run dialogue box or an MS-DOS prompt using the following command line:

```
GLOBAL device_name [/I]
```

where device_name is the bootstrap device (which can refer to either a Discrete Data File Domain (e.g. C:\GSMNT\GSM200), an Integrated Data File (e.g. C:\GSMNT\GL-IPL.DLV) or a diskette (e.g. A:)).

The second parameter is optional and should only be used only when installing Global System Manager.

Important note: Only a **single** Global client can be run on a particular computer.

6.4 GLSERVER.EXE - Start a single Global Server

GLSERVER.EXE is the Windows program which initiates a Global Server. As the name suggests, a Global Server provides the services of a Global System Manager file server but does not provide a user interface (other than the ability to display status and diagnostic messages to its System Messages window). The System Messages window contains the following Menu entries:

```
File           (see section 6.4.1)
Diagnostics    (see section 6.4.2)
Help          (see section 6.4.3)
```

A Global Server is usually initiated by the GLSSTART.EXE utility (see section 6.5) but can be started from the Windows Run dialogue box or an MS-DOS prompt using the following command line:

```
GLSERVER X
```

where X is the GSM node-id (i.e. a single upper-case letter) to be used by this server.

Important note: Multiple Global servers can be run on a particular computer.

6.4.1 Global Server File Menu option

The File menu includes a single entry, Exit, which allows the user to shutdown the Global Server. If the Server detects there are no Global Clients with outstanding connections it will exit immediately. Otherwise (i.e. if at least one Global Client is connected to the Server) a message box with the following warning will be displayed:

```
There are n clients connected to this server
```

```
Continue termination?
```

where n is the number of Global Clients currently connected to the server.

Clicking the "Yes" button will terminate the Global Server.

Important note: Any connected Global Clients will suffer a Network Error (e.g. COMPUTER NOT AVAILABLE ON UNIT A01) when an attempt is made to access the Global Server that has just been terminated. Only terminate Global Servers with connected Global Clients as a last resort otherwise data corruption and data loss may result.

Clicking the "No" button forces the Global Server to resume execution.

6.4.2 Global Server Diagnostics Menu option

The Diagnostics menu includes a single entry, FD logging. This option is available for diagnostic purposes only. It causes the Global Server to log the basic control information (i.e. the FD block) that is passed between a Global Client and the Global Server for all Global file accesses. This diagnostic information is stored in a file called FDLOG.BIN which is created in the same directory as the Global Server executable, GLSERVER.EXE.

Important note: When this option is enabled the Global Server will operate at greatly reduced efficiency. Note also that the log file will grow very rapidly.

6.4.3 Global Server Help Menu option

The Help menu includes a single entry, About..., which displays a message box containing the following information:

```
Global Server Vn.m
```

where n.m is the BACNAT variant number (e.g. 2.1) as described in section 1.5.4.

6.5 GLSSTART.EXE - (Re)Start multiple Global Servers

The GLSSTART.EXE utility provides a very convenient method to start ALL the Global Servers that have been configured on a particular computer. It provides three different modes of operation which are controlled by a command line switch as follows:

```
GLSSTART /ALL | /RESTART | /INDIVIDUAL=X
```

6.5.1 Start All Global Servers

The GLSSTART.EXE /ALL option scans the Global section of the Registry (see Appendix E) and initiates all the Global Servers that are correctly defined.

This option is useful to start all Global Servers after rebooting Windows on a computer.

This program is usually initiated from the Start Global Servers icon or shortcut configured by the installation program (see section 2.2) but can be started from the Windows Run dialogue box or an MS-DOS prompt using the following command line:

```
GLSSTART /ALL
```

6.5.2 Restart All Global Servers

The GLSSTART.EXE /RESTART option scans the Global section of the Registry (see Appendix E) and attempts to access all the Global Servers that are correctly defined. If a particular Server is defined in the Registry but is not currently executing, GLSSTART.EXE will attempt to initiate the Server process.

This option should be used to restart a single Global Server on a computer running multiple servers. Note that if the GLSSTART /ALL option was used in this circumstance any server currently executing would fail with "in use" error when the attempt is made to restart it.

This program is usually initiated from the Restart Global Servers icon or shortcut configured by the installation program (see section 2.2) but can be started from the Windows Run dialogue box or an MS-DOS prompt using the following command line:

```
GLSSTART /RESTART
```

6.5.3 Start a Single Global Server

The GLSSTART.EXE /INDIVIDUAL option starts a specific Global Server:

```
GLSSTART /INDIVIDUAL=X
```

where X is a Server node-id (i.e. a single upper-case letter).

For example, to start Global Server "B" use the following command:

```
GLSSTART /INDIVIDUAL=B
```

Note that the following command:

```
GLSSTART /INDIVIDUAL=X
```

is equivalent to:

```
GLSERVER X
```

as described in section 6.4

6.6 GLDFMAIN.EXE - Global Data File Maintenance Utility

GLDFMAIN.EXE is used to create the Discrete Data File domains and Integrated Data Files that are required by Global System Manager. Note that the Setup utility (see section 2.2) automatically creates the required simulated volumes when Global System Manager is freshly installed (see section 2.2.3.3). Setup also includes the facility to invoke GLDFMAIN when a new Global Server is added to an installed configuration. Consequently, it should only be necessary to run GLDFMAIN.EXE directly on non-standard configurations.

6.6.1 Creating a Discrete Data File Domain

This function is selected by choosing the "New" entry from the "File" menu and then choosing the "Discrete data file" entry from the resulting menu. Alternatively, this function can be selected directly by clicking on the first icon on the toolbar.

When this option is selected, the "Create Discrete Data File" dialogue box will appear which contains a number of prompts for additional parameters.

6.6.1.1 Discrete Data File Directory

This parameter specifies the directory name to be created. The recommended naming convention is:

GSMxnn

within the Global directory (where xnn is the Global System Manager Domain Address (e.g. 200, A00, 250)). Although this convention is recommended, the Discrete Data File Directory can be created anywhere on the Windows filing system provided the corresponding Registry entry (see sections 8.2.1 and 9.2.1) has been established.

6.6.1.2 Volume Format

This parameter specifies the Global System Manager volume format. **The volume format should always be set to T259Z for all standard configurations.** The volume format selected must match that of the corresponding entry in the Global configuration file (see section 8.2.1.1).

6.6.2 Creating an Integrated Data File

This function is selected by choosing the "New" entry from the "File" menu and then choosing the "Integrated data file" entry from the resulting menu. Alternatively, this function can be selected directly by clicking on the second icon on the toolbar.

When this option is selected, the "Create Integrated Data File" dialogue box will appear which contains a number of prompts for additional parameters.

6.6.2.1 Integrated Data File Name

This parameter specifies the name of the file to be created. The recommended naming convention for Integrated Data File Domains is:

GSMxnn.VOL

within the Global directory (where xnn is the Global System Manager Domain Address (e.g. 200)).

The recommended naming convention for Integrated Data File DLV's is:

GSMxnn.DLV

within the Global directory, where xnn is the Global System Manager Domain Address (e.g. 120). Note that this naming convention does not apply to the special IPL DLV's that are created during Global System Manager installation.

Although this convention is recommended, the Integrated Data File can be created anywhere on the Windows filing system provided the corresponding Registry entry (see sections 8.2.2 and 9.2.2) has been established.

6.6.2.2 Size in Megabytes

This parameter specifies the size of the Windows file to be created. Note that this size is not the actual capacity available to Global System Manager (which will be slightly smaller to allow for the Global directory).

6.6.2.3 Quick Allocation

This parameter specifies the method that will be used to create the Windows file. The "Quick Allocation" method merely creates and sizes the file. The "Slow Allocation" creates the file then completely fills the nascent file with binary zeroes.

6.7 Installation Batch Files

Two batch files are optionally installed onto the Global directory (see Appendix E). These batch files are never used during day-to-day operation but are only required to install Global System Manager on the Master Server or a Local SYSRES.

6.7.1 GLINSSRV.BAT - Install Global on Master Server

This simple batch file contains the following command line:

```
GLOBAL.EXE A: /I
```

GLINSSRV.BAT is used to load Global System Manager from the BACRES diskette to commence the installation on the Master Server as described in section 2.3.1.

6.7.2 GLINSCLI.BAT - Install Global on Local SYSRES

This simple batch file contains the following command line:

```
GLOBAL.EXE A:
```

GLINSCLI.BAT is used to load Global System Manager from the BACRES diskette to commence the installation on a Local SYSRES as described in section 2.8.2.2.1.

7. Global Registry Editor

This chapter provides an overview of the Windows Registry and the Global sections within the Registry.

The Global Registry Editor, GLREGED.EXE, is also described in this chapter. GLREGED.EXE has a similar "look-and-feel" to the standard Registry Editor supplied with Windows (e.g. REGEDIT.EXE for Windows 95; REGEDT32.EXE for Windows NT). However, GLREGED only allows the Global sections of the Registry to be updated and its use will prevent the inadvertent corruption of other, non-Global sections of the Registry. In addition, GLREGED has an "in-built knowledge" of the structure of the Global sections of the Registry and validates any Registry changes preventing inconsistencies that could cause the Global Server or Global Client process to fail unexpectedly. Consequently, **GLREGED should always be used in preference to the standard Registry Editor supplied with Windows.**

This chapter should be read in conjunction with Appendix E which provides a detailed structure diagram of the Global sections of the Registry.

7.1 An Overview of the Windows Registry

This section is, by necessity, only a brief overview of the Windows Registry. For a more detailed description of the Registry please refer to Microsoft documentation.

Both the Windows 95 and Windows NT operating systems include a facility termed the "Registry". This database is used to hold the computer, user and application specific information that is accessed both by the Windows operating system and the various applications (e.g. Global System Manager) that run on it. Global System Manager follows the standard practice and uses the Registry to access various "configuration information" stored within it.

IMPORTANT WARNING: The Registry is a very complex structure and any modifications to it MUST be performed with care since any errors or unintentional deletions can result in unpredictable results (including computer crashes).

7.1.1 Registry Structure

The Registry can be considered a database containing a large number of records. Each individual record is linked to another record within the Registry. The connections between records are in the form of Parent-Child relationships and serve to give the Registry an overall tree structure. A parent can have more than one child but a child cannot have more than one parent.

7.1.1.1 Hives, Keys and Subkeys

The term "Key" is associated with the Registry records. If a key has a parent then it is called a "Subkey" of its parent key. Tracing the Child->Parent hierarchy to its top gives the Root Key. These Root Keys, termed "Hives" can be considered as entry points into the Registry from which one can gain access to subkeys. Windows 95 has 6 pre-defined Hives. Windows NT has 4 pre-defined Hives.

By definition, a Root Key does not have a parent key.

The file structure shown by File Manager or Windows Explorer can be considered analogous to the Registry tree structure, with directories corresponding to keys or subkeys; and the drive letter being the Hive.

7.1.1.2 Values

Each Key\Subkey can have information associated with it. Continuing with the analogy of the filing system this information corresponds to a filename within a directory. The term used for the information items in the Registry is "Value". In same way that files may have data associated with them, each "Value" has a single "Data" item associated with it.

7.1.1.3 Data Types

A number of data types are allowed in the Registry. Global System Manager only uses the "String Value" (REG_SZ) and "DWORD Value" (REG_DWORD) data items. The "Binary Value" data item is not currently employed by Global System Manager.

7.1.2 Overall Structure of the Global Registry sections

This section provides a brief description of the keys within the Global sections of the Registry. The complete structure (i.e. keys and value names) is described in Appendix E.

7.1.2.1 Global Keys in the HKEY_LOCAL_MACHINE Hive

The registry structure described in Appendix E is correct at the time of writing but is subject to change during the lifetime of Global System Manager (Windows NT).

7.1.2.2 Global Keys in the HKEY_CURRENT_USER Hive

The registry structure described in Appendix E is correct at the time of writing but is subject to change during the lifetime of Global System Manager (Windows NT).

7.1.3 Registry Editors

The standard Registry Editors (REGEDIT.EXE for Windows 95; REGEDT32.EXE for Windows NT V3.51) allow the addition, deletion and modification of Registry keys; and provide the ability to amend Registry values. However, all the standard Registry Editors allow the entire Registry to be accessed.

7.2 GLREGED.EXE - The Global Registry Editor

The Global Registry Editor, GLREGED.EXE, has a similar "look-and-feel" to the standard Registry Editors but only allows the Global sections of the Registry to be updated. Its use prevents the inadvertent corruption of other, non-Global sections of the Registry. Furthermore, a pair of Registry Template Files (i.e. GLMACH.TLT and GLUSER.TLT) provide GLREGED with the precise structure of the Global sections of the Registry. These template files allow GLREGED to display List Boxes which provide all the valid key and value names, thus preventing the unintentional addition of spurious and misleading items in the Registry. In addition, GLREGED determines the data types associated with the various value names (from information held in the template file), providing another level of validation.

As well as controlling the modification of the Global sections of the Registry, GLREGED also allows associated directories and files to be deleted/created mirroring the deletion/creation of associated Registry items.

To summarise the advantages offered by GLREGED:

1. It restricts access to the Global keys and values so there is no possibility of accidental deletion/modification of non-Global settings;
2. It simplifies Registry additions by presenting lists of valid keys/value names. It also prompts for mandatory values on adding a new key;
3. It acts as a simple install/un-install utility. On adding a new Discrete Data File domain or Integrated Data File volume GLREGED will automatically start the Global Data File maintenance utility, GLDFMAIN.EXE (see section 6.6) with the specified DDF or IDF name.

On deleting an existing Discrete Data File domain or Integrated Data File volume GLREGED will optionally delete the appropriate files and remove the appropriate directories.

7.2.1 Starting GLREGED.EXE

GLREGED.EXE is a standard Windows application: It is started using any of the techniques described in section 6.2.

When GLREGED is initiated, a window is displayed which is split vertically into two panes. The left-hand pane contains a tree diagram of the current Global Registry keys within either of the following hives:

HKEY_LOCAL_MACHINE\SOFTWARE\GLOBAL	(i.e. Machine)
HKEY_CURRENT_USER\SOFTWARE\GLOBAL	(i.e. User)

Initially this section of the window contains an expanded view of the Global keys within the HKEY_LOCAL_MACHINE hive. Note that all other sections of the Registry (e.g. HKEY\CLASSES\ROOT and HKEY_LOCAL_MACHINE\SOFTWARE\MICROSOFT) cannot be accessed, and potentially corrupted, using GLREGED.EXE.

If a key is selected (has the focus) then it is highlighted. Navigation through the tree can be achieved using either the mouse or the <UP-ARROW> and <DOWN-ARROW> keys. Fully expanded tree nodes are indicated by a box containing a "-" sign. These nodes can be contracted by clicking on the "minus-box". Contracted tree nodes are indicated by a box containing a "+" sign. These nodes can be fully expanded by clicking on the "plus-box".

The left-hand pane also includes a Tab Control with two tabs containing the titles MACHINE and USER. This control allows either Global section of the Registry to be examined or updated.

The right-hand pane contains all ValueNames, value types and values contained within the selected key. Keys and value names are selected by clicking on them. The right-hand pane always contains 3 columns with the following titles:

ValueName	A list of the valid ValueNames associated with a particular key is obtained from the relevant
-----------	---

template file. GLREGED will not allow an invalid ValueName to be added to the Registry;

Value GLREGED performs some rudimentary validation of values. However, extreme care must be taken when adding a Value to ensure it is correct. An illegal value will normally result in one of the errors described in Appendix C appearing when the Global Client or Global Server is started.

Some settings are used to enable/disable options in the Global Client or Global Server. Any one of the following string values are valid:

Option enabled Option disabled

Yes	No
True	False
On	Off
1	0

Type The Type of data associated with the ValueName. The type of each ValueName is defined in the relevant template file. GLREGED will not allow an invalid Type to be associated with a particular ValueName.

If a value is selected (has the focus) then it is highlighted.

The line dividing the two panes in the window can be dragged to the left or right (you may want to drag the dividing line to the right to expose the keys in the depths of the Registry). Note also that the ValueName, Value and Type columns can also be re-sized by dragging the vertical line in the Headings Bar. This technique may be required to expand the Value section if a long Windows pathname is specified as a DDF parameter.

GLREGED also includes a tool-bar with the following icons (in left to right order):

- Dump all Global subkeys/valuenames to an "export" file (note that true export/import options are NOT currently available);
- Update (i.e. amend) selected value (this icon is only enabled when the focus is on a specific ValueName);
- Add new key or valuenam (depending on the location of the focus);
- Remove (i.e. delete) currently selected key or value.

7.3 GLREGED Operations

GLREGED allows the following general classes of operation to be performed on the Global sections of the Registry:

- inserting or deleting keys;
- inserting, deleting or amending values;

- dump the contents of the Global section of the Registry in a text file format.

7.3.1 Inserting a Key - Overview

A new key is inserted by selecting its parent key and choosing the Insert icon. For example, to add a new Server "B", select the Servers key before choosing Insert. A dialogue box will appear with a list box which contains a list of all valid keys associated with the parent key. After a key has been selected, GLREGED will check whether it contains any mandatory values and, if so, will display dialogue boxes prompting for them.

7.3.1.1 Inserting a Key - Detailed Instructions

The following step-by-step guide should be followed when inserting a new key:

1. In the left-hand pane of the window: Ensure the focus is on the parent of the key that is to be added. If the focus is not on the required key it can be moved to it in a number of ways.
 - 1a. Using the mouse: By placing the mouse over the key and clicking the left button;
 - 1b. Using the keyboard: By using the <UP-ARROW> and <DOWN-ARROW> keys to navigate through the key structure.
2. Choose the Insert option. This can be achieved in a number of ways:
 - 2a. Using the mouse: Select the Insert icon;
 - 2b. Using the mouse: Select the Edit Menu and choose the Insert option;
 - 2c. Using the keyboard: Select the Edit Menu by keying <ALT> E. Choose the Insert option by keying I;
 - 2d. Using the keyboard: Press the <INSERT> key.
3. Make a selection from the "Key" Dialogue Box that pops-up. This Dialogue Box usually contains a List Box with the valid options for the currently selected parent key. The required key can be selected from the List Box in a number of ways:
 - 3a. Using the mouse: Click on the small down arrow on the right side of the list box. From the list of entries that drop down make a selection by moving the mouse pointer and clicking the left mouse button. The selection appears in the edit section of the list box. Click on the OK button (or key <CR>);
 - 3b. Using the keyboard: Key <SHIFT><TAB>. This will pass the focus to the box. Use the <UP-ARROW> and <DOWN-ARROW> keys to scroll though the possible selections. Key <CR> to accept the current item.
4. If the key selected does not already exist then there may be a succession of Dialogue Boxes requiring various information to be

specified for the mandatory value names associated with the new key.

GLREGED will warn you if you attempt to add a subkey to a Global key that cannot have any subkeys.

7.3.2 Deleting a key - Overview

A key is deleted by selecting it and choosing the Delete icon. A confirmation dialogue box will be displayed to protect against accidental deletion.

7.3.2.1 Deleting a Key - Detailed Instructions

The following step-by-step guide should be followed when deleting an existing key:

1. In the left-hand pane: Ensure the focus is on the key that is to be deleted. If the focus is not on the required key it can be moved to it in a number of ways:
 - 1a. Using the mouse: By placing the mouse over the key and clicking the left button;
 - 1b. Using the keyboard: By using the <UP-ARROW> and <DOWN-ARROW> keys to navigate through the key structure.
2. Choose the Delete option. This can be achieved in a number of ways:
 - 2a. Using the mouse: Select the Delete icon;
 - 2b. Using the mouse: Select the Edit Menu and choose the Delete option;
 - 2c. Using the keyboard: Select the Edit Menu by keying <ALT> E. Choose the Delete option by keying D;
 - 2d. Using the keyboard: Press the <DELETE> key.
3. Respond to the Confirmation Box that pops up a warning regarding the key that will be deleted.

Important note 1: Any subkeys of the selected key will also be deleted. Any Value Names and Values associated with the deleted key(s) will also be deleted.

Important note 2: If the deleted key has an associated Value Name that specifies a file or directory, a further confirmation Box will appear providing the option to remove the directory and files from the filing system.

7.3.3 Displaying the Values Associated with a Key

The right-hand pane contains all ValueNames, Values and Types contained within the selected key. As the focus changes from one key to another in the left-hand pane, the Value Names, Values and Types associated with the currently selected key (if any) are automatically displayed in the right-hand pane. Note that some keys may have no associated values.

7.3.4 Inserting a value - Overview

A value is inserted by selecting the key which holds it, clicking on the right-hand pane and choosing the Insert icon. A dialogue box will appear with a list box which contains a list of all valid value names associated with the chosen key. After choosing a value name another dialogue box will appear prompting for the actual value.

Important note: Unlike the standard Registry Editor supplied with the Windows operating system, GLREGED forbids any attempt to add an invalid ValueName or Type.

7.3.4.1 Inserting a value - Detailed Instructions

The following step-by-step guide should be followed when inserting a value:

1. In the left-hand pane: Ensure the focus is on the key to which a new ValueName is to be added. If the focus is not on the required key it can be moved to it in a number of ways.
 - 1a. Using the mouse: By placing the mouse over the key and clicking the left button;
 - 1b. Using the keyboard: By using the <UP-ARROW> and <DOWN-ARROW> keys to navigate through the key structure.
2. When the focus is on the desired key, place the window focus on the right-hand pane. This is achieved in a number of ways:
 - 2a. Using the mouse: Simply place the mouse in the right-hand pane and click on the left mouse-button;
 - 2b. Using the keyboard: Use the <TAB> key to toggle between the left-hand and right-hand panes.
3. Choose the Insert option. This can be achieved in a number of ways:
 - 3a. Using the mouse: Select the Insert icon;
 - 3b. Using the mouse: Select the Edit Menu and choose the Insert option;
 - 3c. Using the keyboard: Select the Edit Menu by keying <ALT> E. Choose the Insert option by keying I;
 - 3d. Using the keyboard: Press the <INSERT> key.
4. The "KeyValues" Dialogue Box will appear. This Dialogue Box will normally contain a List Box with all the valid ValueNames for the currently selected Key. Make a selection from the "KeyValues" Dialogue Box. The required ValueName can be selected from the List Box in a number of ways:
 - 4a. Using the mouse: Click on the small down arrow on the right side of the list box. From the list of entries that drop down make a selection by moving the mouse pointer and clicking the left mouse-button. The selection appears in the edit section of the list box. Click on the OK button or key <CR>;

- 4b. Using the keyboard: Key <SHIFT><TAB>. This will pass the focus to the box. Use the <UP-ARROW> and <DOWN-ARROW> keys to scroll through the possible selections. Key <CR> to accept the current item.
5. A Key Value Dialogue Box will appear allowing the Value to be entered. The Value Edit Box contains the default value for the ValueName. If the default value is not appropriate, enter the value you require. When the required value has been entered, click the OK button (or key <CR>) to select the value and enter it into the Registry.

7.3.5 Amending a value - Overview

A value is amended by selecting the ValueName and choosing the Amend icon. A dialogue box will appear prompting for a new value.

7.3.5.1 Amending a value - Detailed Instructions

The following step-by-step guide should be followed when amending an existing value:

1. In the left-hand pane: Ensure the focus is on the key under which the required ValueName exists. If the focus is not on the required key it can be moved to it in a number of ways.
 - 1a. Using the mouse: By placing the mouse over the key and clicking the left button;
 - 1b. Using the keyboard: By using the <UP-ARROW> and <DOWN-ARROW> keys to navigate through the key structure.
2. When the focus is on the desired key, place the window focus on the right-hand pane. This is achieved in a number of ways:
 - 2a. Using the mouse: Simply place the mouse in the right-hand pane and click on the left mouse-button;
 - 2b. Using the keyboard: Use the <TAB> key to toggle between the left and right panes.
3. In the right-hand pane, select the ValueName. This is achieved in a number of ways:
 - 3a. Using the mouse: Move the mouse over the desired name and click on the left mouse button;
 - 3b. Using the keyboard: Use the <UP-ARROW> and <DOWN-ARROW> keys to select the required line.
4. Display the "Key Value" Dialogue Box, for subsequent amendment. This is done in a number of ways:
 - 4a. Using the mouse: Select the Amend icon;
 - 4b. Using the mouse: Select the Edit Menu and choose the Amend option;
 - 4c. Using the mouse: Double-click the left mouse-button;
 - 4d. Using the keyboard: Select the Edit Menu by keying <ALT> E. Choose the Amend option by keying A;

- 4e. Using the keyboard: Key <CR>.
5. The "Key Value" Dialogue Box allows the current Value to be amended. The Value Edit Box contains the current value for the ValueName. When the required value has been entered, click the OK button (or key <CR>) to select the value and enter it into the Registry.

7.3.6 Deleting a value - Overview

A value is deleted by selecting the value name and choosing the Delete icon. A confirmation dialogue box will be displayed to protect against accidental deletion.

7.3.6.1 Deleting a value - Detailed Instructions

The following step-by-step guide should be followed when deleting an existing value:

1. In the left-hand pane: Ensure the focus is on the key under which the required ValueName exists. If the focus is not on the required key it can be moved to it in a number of ways.
 - 1a. Using the mouse: By placing the mouse over the key and clicking the left button;
 - 1b. Using the keyboard: By using the <UP-ARROW> and <DOWN-ARROW> keys to navigate through the key structure.
2. When the focus is on the desired key, place the window focus on the right-hand pane. This is achieved in a number of ways:
 - 2a. Using the mouse: Simply place the mouse in the right-hand pane and click on the left mouse-button;
 - 2b. Using the keyboard: Use the <TAB> key to toggle between the left-hand and right-hand panes.
3. In the right-hand pane, select the ValueName. This is achieved in a number of ways:
 - 3a. Using the mouse: Move the mouse over the desired name and click on the left mouse button;
 - 3b. Using the keyboard: Use the <UP-ARROW> and <DOWN-ARROW> keys to select the required line.
4. Choose the Delete option. This can be achieved in a number of ways:
 - 4a. Using the mouse: Select the Delete icon;
 - 4b. Using the mouse: Select the Edit Menu and choose the Delete option;
 - 4c. Using the keyboard: Select the Edit Menu by keying <ALT> E. Choose the Delete option by keying D;
 - 4d. Using the keyboard: Press the <DELETE> key.

5. Respond to the Confirmation Box that pops up a warning regarding the key that will be deleted.

7.3.7 Dumping the Global Registry to a Text File

This option allows the Global sections of the Registry to be dumped to a text file in a format that is suitable for subsequent analysis.

Select the "Dump" icon. Alternatively, from the File Menu, select the Export (sic) option This achieved with the mouse; or by <ALT> F, followed by E.

This option creates a text file GLREGED.LOG, within the Global directory.

7.3.8 Export from the Global Registry

Unlike the standard Microsoft Registry Editor, GLREGED does NOT include an Export Registry to File option.

7.3.9 Import to the Global Registry

Unlike the standard Microsoft Registry Editor, GLREGED does NOT include an Import Registry from File option.

7.3.10 Printing the Global Registry

Unlike the standard Microsoft Registry Editor, GLREGED does NOT currently include a Print Registry option.

8. Global Client Configuration

This chapter describes the special considerations that apply when Global Configurator is used to update a Global System Manager (Windows NT) client configuration file. Chapter 9 describes the location and contents of the Global System Manager (Windows NT) server configuration files.

In general, the controller entries that appear within a Global System Manager (Windows NT) Client configuration file refer to corresponding entries in the Registry (see Chapter 7 and Appendix E). Typically, each entry in the Global configuration file corresponds to a ValueName in the Windows Registry. This chapter, which should be read in conjunction with the Global Configurator Manual and Chapter 7 and Appendix E of this manual, explains how information in the Global configuration file is related to data in the Registry. All references to the Global Configurator Manual are of the form CF-n.n.

The final section of this chapter describes those Registry entries that do not correspond to entries in the Global configuration file.

Note that the Registry shorthand convention defined in Appendix E is also used in this chapter, so that the shorthand meta-key:

`$GLUSER`

corresponds to the full Registry key:

`HKEY_CURRENT_USER\Software\Global`

and the shorthand meta-key:

`$GLMACH`

corresponds to the full Registry key:

`HKEY_LOCAL_MACHINE\Software\Global`

8.1 Machine Name and Bootstrap Messages [CF-3.2]

All Global System Manager V8.1 (Windows NT) Client configurations are level 9 (i.e. BOS/XLAN (sic) or LEVEL9). The same computer architecture code (W), computer machine code (W1) and computer sub-code (1) are used for all the current Global System Manager (Windows NT) implementations. The MACHINE NAME and BOOTSTRAP MESSAGE (sic) are as described in CF-3.2.

8.1.1 How to Locate the Global Client Configuration File

If the Global Client loads from a Local SYSIPL (i.e. with a Shared SYSRES on the Master Server) the Client configuration file and Action File (A.W1) will both be present on the local SYSIPL volume (e.g. 110). Any modifications to the configuration file will only affect a single client.

If the Global Client is configured with a Local SYSRES the Client configuration file and Action File (A.W1) will both be present on the local SYSRES volume (e.g. 201). Any modifications to the configuration file will only affect a single client.

8.2 Data File Definitions [CF-3.3]

The DATA FILE DEFINITIONS section of a Global System Manager (Windows NT) Client configuration file corresponds to the DIRECT ACCESS CONTROLLERS section of the example configuration file described in the Global Configurator Manual.

The following controller names are allowed:

DDF	Discrete data file domain
DISKETTE	Diskette drive
IDF	Integrated data file domain

Important note: The Data File Definitions in the Global Client configuration only refer to the local computer (e.g. Local DDF unit 200). The Data File Definitions in the Global Server configuration refer to the network-wide domains (e.g. network DDF unit A00). Please refer to section 9.2 for details of the Global Server Data File Definitions.

Note also that a RAM disk is NOT supported on Global System Manager (Windows NT) Client configurations.

8.2.1 DDF - Discrete Data File (Separated Subunit) Domain

The terms "Discrete Data File (DDF)" and "Separated Data File (SSD)" are used synonymously throughout this manual. Simulated volume controller "DDF" uses Windows file functions (e.g. Open, Read and Write) to map a collection of Windows files, within a single Windows directory, to a Global System Manager domain. Each Windows file in the directory corresponds to a single Global System Manager sub-volume. The overwhelming advantage of a Discrete Data File controller over an Integrated Data File controller (see section 8.2.2) is that the size of the domain is not fixed but may be increased dynamically as new sub-volumes (i.e. Windows files) are created.

The naming convention for the Windows directory is GSMnnn where nnn is the domain number (e.g. GSM200). The files in this directory will be named nnnvvvvv.SVL, where nn is the sub-volume number and vvvvvv is the file name. For example, Windows file 01SYSRES.SVL will correspond to Global System Manager sub-volume 201 (in domain 200), volume name SYSRES. In addition to the sub-volume files, the directory always contains a special header/index file, named 00dddddd.SVL where ddddd is the name of the Global System Manager domain (e.g. SYSDOM). **THE HEADER FILE MUST NEVER BE DELETED.**

Non alphanumeric ASCII characters (e.g. *, ?, !, \$ etc.) are allowed in Global System Manager sub-volume names. These special characters are filtered out by the DDF device driver to ensure that the name of the Windows file corresponding to the Global System Manager sub-volume conforms to the Windows file naming conventions. The Global System Manager sub-volume names that contain special characters, when observed in a Windows directory (e.g. using Windows Explorer) will appear very different.

The following example illustrates this effect:

Unit	Volume name	Windows file
201	*TEST!	01TEST.SVL
202	\$\$WORK	02WORK.SVL

```

210  $$$$$$          10.SVL
268  ???MD*         68MD.SVL

```

If two, or more, Windows files with the same number are present in the Windows directory (e.g. 10PLDATA.SVL and 10SLDATA.SVL) Global System Manager will ignore **ALL** the Windows files with the same "unit number". In this example, if an attempt is made to access sub-volume 210, a "SUB-VOLUME NOT ALLOCATED" error will be displayed. If an attempt is made to list domain 200, an "ERROR Z" will result.

The following example illustrates the relationship between Windows directories and files and Global System Manager domain and sub-volumes in a purely artificial configuration that includes DDF controllers (units 200 and 250):

Windows Global Type name	Windows Name	Global Type	Unit number	Global Volume
Directory	GSM200	Domain	200	
File	00SYSDOM.SVL	Domain	200	SYSDOM
File	01SYSRES.SVL	Sub-volume	201	SYSRES
File	02SLDATA.SVL	Sub-volume	202	SLDATA
File	05LIST.SVL	Sub-volume	205	LIST
File	49TEST1.SVL	Sub-volume	249	TEST1
Directory	GSM250	Domain	250	
File	00DISK2.SVL	Domain	250	DISK2
File	01DISK2.SVL	Sub-volume	251	DISK2
File	49TEST2.SVL	Sub-volume	299	TEST2

8.2.1.1 DDF Global Configurator Options

When Global Configurator is used to add or amend a DDF controller, no configuration-specific prompts appear in addition to the standard prompts described in section 3.3 of the Global Configurator Manual.

The DRIVE number corresponds to the last character of the following ValueName in the Registry (see Appendix E):

```

Key          $GLMACH\Client\Data\DiscreteDataFiles
ValueName    DDFn

```

The DESCRIPTION is explained in CF-3.3. The VOLUME FORMAT, MAXIMUM NUMBER OF FILES, NUMBER OF SUBUNITS and UNIT NUMBERS are also described in CF-3.3. The VOLUME FORMAT **must** be T259Z. **The MAXIMUM NUMBER OF FILES must be left at the default value of 250.** The DRIVE parameter must match a DDFn ValueName in the Registry otherwise the UNIT NUMBER will not be available. The Windows directory_name from the corresponding data value in the Registry will be used to hold the discrete data files.

For example, the following entry in the configuration file:

```

CONTROLLER (DDF ) : Discrete data file domain
  DRIVE ( 0 ):
  DESCRIPTION (Discrete data file domain) :

VOLUME FORMAT (T259Z ) : Discrete Data File Domain
MAXIMUM NUMBER OF FILES ( 250) :

```

NUMBER OF SUBUNITS (99) :
UNIT NUMBER (200) :

corresponds to the following Registry entry:

```
Key           $GLMACH\Client\Data\DiscreteDataFiles
ValueName    DDF0
Data         C:\GSMNT\GSM200
```

Discrete Data Files (with every sub-volume corresponding to a file in a Windows directory specified in the Registry) should be used in preference to Integrated Data Files (with the entire domain corresponding to the Windows file specified in the Registry).

The standard Client configuration files supplied with Global System Manager (Windows NT) for systems distributed on diskette include a single DDF controller (format T259Z, unit 200, 99 sub-volumes, 250 files/sub-volume).

Important note: The local DDF will only be recognised if either the "Local SYSRES" or "Local DDF" options were selected when the Global Client was installed (see section 2.2.4.4 and 2.2.4.5).

Volume format T259Z should be used by the DDF controller. This volume format can be used with Windows partitions up to 2Gb in size (i.e. the highest volume capacity supported by Global System Manager). Note that other (obsolete) DDF volume formats, that only support Windows partitions up to a limit of 512Kb, are available for compatibility with Global System Manager (MS-DOS) configurations. The complete list of Discrete Data File Domain volume types is as follows:

Volume format	Windows size limit	Virtual track size
T151Z	512 Mb	8 Kb
T224Z	512 Mb	8 Kb
T259Z	2 Gb	32 Kb

8.2.1.2 DDF Registry Options

This section should be read in conjunction with Appendix E. Every DDF controller in the Global Configuration file must have a corresponding entry in the Registry otherwise the simulated volume will be removed dynamically from the configuration when the Global Client is started (i.e. the domain will not appear in the \$U report and an ASSIGNMENT ERROR will occur when attempting to access it). The last character of the ValueName for a particular DDF entry in the Registry, which must be a single digit between 0 and 9, corresponds to the DRIVE number for that domain in the Global Configuration file.

For example:

```
Registry Key           $GLMACH\Client\Data\DiscreteDataFiles
Registry ValueName    DDF0
Registry Data         C:\GSMNT\GSM200
Configuration file    DRIVE = 0

Registry Key           $GLMACH\Client\Data\DiscreteDataFiles
Registry ValueName    DDF1
Registry Data         C:\GSMNT\GSM250
Configuration file    DRIVE = 1
```

Important note: Although it is possible to specify a relative pathname for the Windows directory in the Registry (e.g. GSM200) an absolute pathname (e.g. C:\GSMNT\GSM200) is **strongly recommended**. An absolute pathname is absolutely essential if the "Set Default Directory" function is executed using the SVC-61 interface.

In addition to DDFn, the following additional ValueNames appear under the \$GLMACH\Client\Data\DiscreteDataFiles key in the Registry.

8.2.1.2.1 HANDLES

This ValueName specifies the maximum number of Windows files the Discrete Data File controller is allowed to open simultaneously. The default value is 10. Note that the same pool of handles is used by all the DDF controllers configured for a particular Global Client (e.g. DDF0, DDF1, DDF2 etc. share the same pool of file handles).

8.2.1.2.2 InactivityTimeout

If the data associated with this ValueName is nonzero, the Global Client will close all Windows files opened by the Discrete Data File controller for a particular domain after a period of inactivity. The timeout period is specified in minutes and must be in the range 1 to 600. A value of 0 (i.e. the default) disables the automatic file closure. Note that an independent timer is maintained for each DDF domain in a multiple-DDF configuration (e.g. DDF0 & DDF1). The timeout period is reset whenever any sub-volume file in the domain directory is accessed. When the timeout period expires all the open files in the domain directory are closed.

8.2.1.3 DDF Windows File Creation

GLDFMAIN.EXE (see section 6.6.1) must be used to create the Windows directory and header file before the DDF controller will recognise a Discrete Data File domain. Note that if GLREGED.EXE is used to Insert a new DDFn Value, the option to run GLDFMAIN.EXE to create the required Windows directory and file will be provided automatically.

Important note: Note that GLDFMAIN does NOT initialise the domain, the \$V "Initialise" function (see section 4.9.3) must be used to prepare the simulated volume for use by Global System Manager.

8.2.1.4 DDF Operating Notes

The size of the 00ddddd.SVL header file (e.g. 00SYSDOM.SVL) within the Windows directory created by GLMKDDF.EXE (see section 6.4.1) MUST match the volume format in the Global System Manager configuration file:

Volume format	Size of 00ddddd.SVL
T151Z	32 Kb
T224Z	32 Kb
T259Z	64 Kb

If the size of the 00ddddd.SVL header file does not match the volume format defined in the configuration file, a "HARDWARE ERROR" will be reported for the DDF controller when Global Client is started and the simulated volume will be removed dynamically from the configuration (i.e. the domain will not appear in the \$U report and an ASSIGNMENT ERROR will occur when attempting to access it).

The DDF controller sets the Windows "archive bit" if the contents of any sub-volume are changed. This allows the use of a Windows based

archival backup utility with Global System Manager sub-volume files. Note that the Windows file that corresponds to the SYSRES volume (e.g. 01SYSRES.SVL) is ALWAYS updated whenever Global System Manager is started.

Furthermore, the DDF controller checks that all Windows volume files are an exact multiple of the virtual track size. If the size of an Windows volume file is not an exact multiple of the track size then the corresponding Global System Manager sub-volume will be removed. The sub-volume will not appear in the domain listing produced by \$F or \$V and an ERROR Z will be reported at the end of the domain listing.

Note that there is no equivalent of the GLEDDF.EXE utility, supplied with Global System Manager (MS-DOS and Windows), that can be used to round-up the size of a Windows sub-volume file to an exact multiple of the virtual track size.

The Windows hard-disk compression feature can cause problems when used in conjunction with Global System Manager because Global System Manager expects the size of the hard-disk to remain fixed whilst it is running. This assumption may be invalid when a disk compression driver is in use: The amount of disk space occupied by a file alters as data is written to it, making it possible for the hard-disk to be filled whilst Global System Manager still reports free space. The DDF controller reports an "INSUFFICIENT SPACE" error if this condition is detected.

The Global System Manager "Long Volume Descriptions" are persistent and are not removed when a Windows sub-volume file is deleted. All the 50 character Long Volume Descriptions for a domain are held in the 00ddddd.SVL domain header file rather than being associated with individual sub-volume data files (e.g. nnnvvvv.SVL). If a sub-volume data file is copied to a data directory using Windows it will automatically inherit the Long

Volume Description associated with the corresponding sub-volume number. The same effect occurs if a sub-volume data file is "renumbered" using a Windows file rename operation. Volume format T151Z for use with Global System Manager (Windows NT) is isometric with volume format T224Z for use with Global System Manager (Unix). Thus, Global System Manager "sub-volume files" can be interchanged, after appropriate copying and renaming, between Global System Manager (Windows) and Global System Manager (Unix).

Important note: Sub-volume files from T224Z Discrete Data File domains can be interchanged with sub-volume files from T151Z domains **provided the number of files per sub-volume is the same for both domains**. Note that the default number of files per sub-volume is 99 for volume format T224Z but 250 for volume format T151Z, although the default value of 99 can be, and often is, overridden by the more sensible value of 250 when using Global Configurator to add volume format T224Z to a configuration file. If a sub-volume file containing a "99 file directory" is copied to a "250 file domain", and Global System Manager restarted, the sub-volume will appear correct in a \$F domain listing and may even appear correct in a \$F sub-volume listing but data corruption will occur when attempting to access files on the "99 file sub-volume".

Sub-volume files from T151Z (and T224Z) domains can be copied to T259Z domains only if both the source and destination domains are configured

with the same number of files per directory (normally 250) AND the "size rounding-up" technique of the GLENDFF.EXE utility (see section 6.4.3 of the Global System Manager (MS-DOS and Windows) Manual) is used. However, the domain header file (i.e. 00ddddd.SVL) from a T151Z domain directory cannot be copied to a T259Z directory thus all Long Volume Descriptions will be lost.

8.2.2 IDF - Integrated Data File (Virtual Hard Disk)

Simulated volume controller "IDF" uses Windows file functions (e.g. Open, Read and Write) to map a single Windows file to a Global System Manager domain. This interface can be very slow for large domains. The IDF controller is available only to access the small IPL DLV's required to initiate the Global Client (i.e. format Z151Z).

Note that the IDF controller may also be required to provide compatibility with existing Global System Manager (MS-DOS) configurations that include an IDF domain (e.g. format P151Z). **The Integrated Data File technique for accessing Windows simulated domains is considered obsolete and has been superseded by the Discrete Data File controller (see section 8.2.1).**

8.2.2.1 IDF Global Configurator Options

When Global Configurator is used to add or amend an IDF controller, no configuration-specific prompts appear in addition to the standard prompts described in section 3.3 of the Global Configurator Manual.

The DRIVE number corresponds to the last character of the following ValueName in the Registry (see Appendix E):

Key	\$GLMACH\Client\Data\IntegratedDataFiles
ValueName	IDFn

The DESCRIPTION is explained in CF-3.3. The VOLUME FORMAT, MAXIMUM NUMBER OF FILES, NUMBER OF SUBUNITS and UNIT NUMBERS are also described in CF-3.3. The VOLUME FORMAT for a SYSIPL DLV **must** be Z151Z. The UNIT for a SYSIPL DLV **must** be 110. The various VOLUME START ADDRESS and VOLUME END ADDRESS parameters **must not** be modified. The DRIVE parameter must match an IDFn ValueName in the Registry otherwise the UNIT NUMBER will not be available. The Windows file_name from the corresponding data value in the Registry will be used for the integrated data file. For example, the following entry in the configuration file:

```
CONTROLLER (IDF ) : Integrated data file
  DRIVE ( 0 ):
  DESCRIPTION (Integrated data file ) :

VOLUME FORMAT (Z151Z ) : Integrated Data File DLV
  UNIT NUMBER ( 110 ) :
  VOLUME START ADDRESS -
    CYLINDER ( 0 ) : HEAD ( 1 ) : SECTOR ( 0 ) :
  VOLUME END ADDRESS -
    CYLINDER ( 511 ) : HEAD ( 1 ) : SECTOR ( 7 ) :
```

corresponds to the following Registry entry:

Key	\$GLMACH\Client\Data\IntegratedDataFiles
ValueName	IDF0
Data	C:\GSMNT\GL-IPL.DLV

The standard configuration files supplied with Global System Manager (Windows NT) for systems distributed on diskette include a single IDF controller (format Z151Z, unit 110, 250 files).

THE SINGLE INTEGRATED DATA FILE CONTROLLER PRESENT IN ALL CONFIGURATION FILES DISTRIBUTED WITH GLOBAL SYSTEM MANAGER (WINDOWS NT) SHOULD NEVER BE DELETED.

8.2.2.1.1 IDF and Integrated Data File Domains

Although it is possible to use the IDF controller to access an Integrated Data File Domain (e.g. volume format P259Z) such a configuration is not recommended. Discrete data files (with every sub-volume corresponding to a Windows file in the directory specified in the Registry - see section 8.2.1) should be used in preference to integrated data files (with the entire domain corresponding to the Windows file specified in the Registry).

The IDF controller is included in Global System Manager (Windows NT) Client configurations solely to support the Integrated Data File DLV (i.e. format Z151Z). The following section is documented for completeness only.

Volume format P259Z can be used with Windows partitions up to 2Gb in size (i.e. the highest volume capacity supported by Global System Manager). Note that other (obsolete) IDF volume formats are available. The complete list of Integrated Data File volume types is as follows:

Volume format	Windows size limit	Virtual track size
P151Z	256 Mb	4 Kb
P224Z	512 Mb	8 Kb
P246Z	1 Gb	16 Kb
P249Z	1 Gb	16 Kb
P259Z	2 Gb	32 Kb

Note that volume formats P246Z and P249Z are isometric.

If the volume format specified in the configuration file is unable to support the appropriate simulated volume then that domain will automatically be excluded when loading Global System Manager. This fact can be verified by renaming the configuration file such that its last letter is a "D" and then reloading global System Manager.

8.2.2.2 IDF Registry options

This section should be read in conjunction with Appendix E. Every IDF controller in the Global Configuration file must have a corresponding entry in the Registry otherwise the simulated volume will be removed dynamically from the configuration when the Global Client is started (i.e. the domain will not appear in the \$U report and an ASSIGNMENT ERROR will occur when attempting to access it). The last character of the ValueName for a particular IDF entry in the Registry, which must be a single digit between 0 and 9, corresponds to the DRIVE number for that domain in the Global Configuration file. For example:

Registry Key	\$GLMACH\Client\Data\IntegratedDataFiles
Registry ValueName	IDFO
Registry Data	C:\GSMNT\GL-IPL.DLV
Configuration file	DRIVE 0
Registry Key	\$GLMACH\Client\Data\IntegratedDataFiles

Registry ValueName	IDF1
Registry Data	C:\GSMNT\GSM200.VOL
Configuration file	DRIVE 1

Important note: Although it is possible to specify a relative pathname for the Windows filename in the Registry (e.g. GL-IPL.DLV) an absolute pathname (e.g. C:\GSMNT\GL-IPL.DLV) is **strongly recommended**. An absolute pathname is absolutely essential if the "Set Default Directory" function is executed using the SVC-61 interface.

In addition to IDF_n, the following additional ValueNames appear under the \$GLMACH\Client\Data\DiscreteDataFiles key in the Registry.

8.2.2.2.1 InactivityTimeout

If the data associated with this ValueName is nonzero, the Global Client will close all Windows files opened by the Integrated Data File controller after a period of inactivity. The timeout period is specified in minutes and must be in the range 1 to 600. A value of 0 (i.e. the default) disables the automatic file closure.

8.2.2.3 IDF Windows File Creation

GLDFMAIN.EXE (see section 6.6.2) must be used to create the Windows file before the IDF controller will recognise an Integrated Data File volume. Note that if GLREGED.EXE is used to Insert a new IDF_n Value, the option to run GLDFMAIN.EXE to create the required Windows directory and file will be provided automatically.

Important note: Note that GLDFMAIN does NOT initialise the domain, the \$V "Initialise" function (see section 4.9.3) must be used to prepare the simulated volume for use by Global System Manager.

8.2.2.4 IDF Operating Notes

The Windows hard-disk compression feature can cause problems when used in conjunction with Global System Manager because Global System Manager expects the size of the hard-disk to remain fixed whilst it is running. This assumption may be invalid when a disk compression driver is in use: The amount of disk space occupied by a file alters as data is written to it, making it possible for the hard-disk to be filled whilst Global System Manager still reports free space. The DDF controller reports an "INSUFFICIENT SPACE" error if this condition is detected.

8.2.3 DISKETTE - Diskette drive

Up to 2 diskette drives are supported for reading and writing. Diskette formatting is NOT supported by Global System Manager (Windows NT).

8.2.3.1 DISKETTE Global Configurator Options

The DRIVE number must either 0 or 1. The DESCRIPTION is explained in CF-3.3. The VOLUME FORMAT and UNIT NUMBERS are also described in CF-3.3. The only volume format "aN" codes that are supported are "02" (1.44Mb) and "B3" (720Kb). The DRIVE parameter must be 0 or 1 (corresponding to drives A: and B:, respectively). The standard Windows diskette device driver will be used to access the diskette (i.e. there is no need to specify either a Windows device name or a diskette aN code - formats "02" and "B3" are assumed and are automatically selected when a diskette is accessed). For example, the following DISKETTE entry will appear in the configuration file:

CONTROLLER (DISKETTE) : Diskette drive

```

DRIVE ( 0):
DESCRIPTION (1st diskette drive (A:) :

VOLUME FORMAT ( ) :O2A 3" IBM HIGH CAPACITY
UNIT NUMBER ( 140) :

VOLUME FORMAT ( ) :O2B "O2A WITH 250 FILES"
UNIT NUMBER ( 142) :

VOLUME FORMAT ( ) :B3B 3" APRICOT DS,DD (80T)
UNIT NUMBER ( 170) :

```

Note that there is no one-to-one correspondence between a configuration file DISKETTE controller entry and a "Diskette" key in the Registry.

The standard configuration files supplied with Global System Manager (Windows NT) for systems distributed on diskettes include a single DISKETTE controller with the following formats:

```

B3B    O2A    O2B

```

8.2.3.2 DISKETTE Registry Options

Access to the local diskette drive(s) is dependent on the data value of the following ValueName in the Registry:

Key	\$GLMACH\Client\Data
ValueName	Diskette
Data	0 Client cannot access the diskette drive(s)
	1 Client can access the diskette drive
	N Reserved for future use - Do not use

If this data value is 0, any diskette drives included in the configuration file will be dynamically removed. The Diskette ValueName in the Registry is required to prevent the possibility of simultaneous access by both a Global Client and a Global Server on the same computer.

Important Note: The \$GLMACH\Client\Data\Diskette flag is set 1, allowing access to the diskette drive, by a standard Global Client installation.

Note that the Data Type for the "Diskette" ValueName is a REG_DWORD not a REG_SZ (see section 7.1.1.3). Consequently, none of the standard enable/disable strings (e.g. "True", "False") can be used for the strictly numeric "Diskette" value.

8.3 User Display Attributes [CF-3.4]

The USER DISPLAY ATTRIBUTES section of a Global System Manager (Windows NT) Client configuration file corresponds to the CONSOLE CONTROLLERS section of the example configuration file described in the Global Configurator Manual.

The following controller names are allowed:

GUI	Global GUI console
SERIAL	Serial console

8.3.1 GUI - Global GUI console

All standard Client configurations include a GUI console controller. This controller, which uses a number of windows on the integral screen, is fully described in Chapter 5 and Appendix F. This section merely describes the Global Configurator options and the general-purpose Registry parameters that are not covered in Chapter 5 and Appendix F.

One of the following Terminal Attribute Programs MUST be used with the GUI console controller:

\$.711	Global Windows Workstation (GUI) standard
\$.712	Windows Terminal Emulator (i.e. text-only, non-GUI)
\$.713	GUI - short status line
\$.714	GUI - pound/hash translation
\$.715	GUI - short status line & pound/hash translation

8.3.1.1 GUI Global Configurator Options

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 CF-2.4 (sic).

The standard configuration files supplied with Global System Manager (Windows NT) include a single GUI controller. Only one GUI controller is allowed in a particular configuration file.

8.3.1.2 GUI Registry Options

As explained above, most of the Registry values that control the operation of the GUI console controller are fully described in Appendix F. All the ValueNames described in Chapter F are within the following Registry keys:

\$GLMACH\Client\Screens\GUI\Colour
and:
\$GLMACH\Client\Screens\GUI\Miscellaneous

This section only describes the relatively few ValueNames within the following keys:

\$GLMACH\Client\Screens\GUI
and:
\$GLUSER\Client

8.3.1.2.1 GUI Registry Options in the HKEY_LOCAL_MACHINE Hive

The following key MUST be present in the Registry in order for the GUI console to function:

\$GLMACH\Client\Screens\GUI

Below this key, two subkeys include ValueNames that parameterise the specific behaviour of the GUI controller (see chapter 5 and Appendix F for further details):

\$GLMACH\Client\Screens\GUI\Colour
and:
\$GLMACH\Client\Screens\GUI\Miscellaneous

However, the following ValueNames, within the \$GLMACH\Client\Screen\GUI key parameterise the general behaviour of the GUI controller.

8.3.1.2.1.1 DisplayBufferSize

This setting specifies the shared memory buffer size used to communicate between the GUI and interpreter threads in the Global Client process. The display buffer size must be in the range 1024 to 4096, and should be larger than the display buffer size specified in the configuration file. The default value is 2048.

8.3.1.2.1.2 KeyboardBufferSize

This setting specifies the shared memory buffer sizes used to communicate between the GUI and interpreter threads in the Global Client process. The keyboard buffer size must be in the range 256 to 1024. The default value is 256.

8.3.1.2.1.3 ReceivePollDivisor

This setting specifies the frequency at which keyboard input is checked. Note that the ReceivePollDivisor count is only examined during the poll of the transmit buffer, hence the value of the ReceivePollDivisor must be multiplied by the value of the TransmitPollDivisor to obtain the frequency. For example, using the default values of 100 and 10 the keyboard buffer is examined on every 1000th poll. The poll routine is called on every instruction cycle performed by the Cobol interpreter so decreasing the divisor counts will degrade the performance of Global System Manager. The default value is 100.

8.3.1.2.1.4 TransmitPollDivisor

This setting specifies the frequency at which displays are restarted. The poll routine is called on every instruction cycle performed by the Cobol interpreter so decreasing the divisor counts will degrade the performance of Global System Manager. The default value is 10.

8.3.1.2.2 GUI Registry Options in the HKEY_CURRENT_USER Hive

A number of ValueNames within the following Registry key allow certain user-specific parameters to be parameterised:

\$GLUSER\Client

The data value of the following Registry ValueName is used to supply the Operator-id (e.g. "ALAN") associated with the GUI console.

8.3.1.2.2.1 OperatorID

This 4 character string specifies the Global System Manager Operator-id (e.g. ALAN) for the current Windows user.

Important note: The Global System Manager Operator-id is case sensitive so that, for example, an operator-id of "ALAN" is considered different from an operator-id of "alan".

If this ValueName is not present in the Registry, the OPERATOR-ID prompt described in section 3.2.2 will appear when you load the Global Client.

8.3.1.2.2.2 TerminalType

This 4 character string specifies the Global System Manager Terminal Type (e.g. 711) for the current Windows user. The available TAP's are described in section 8.3.1 (although only \$.711 is currently installed

automatically by Global System Manager). Note that only the numeric portion of the TAP name (e.g. "711") is specified in the Registry.

If this ValueName is not present in the Registry, the TERMINAL TYPE prompt (see section 3.2.3) will appear when you load the Global Client.

Important note: The two Registry ValueNames described above are the only current examples of Global configuration data held in the HKEY_CURRENT_USER Registry Hive.

8.3.2 SERIAL - Serial console

Up to 99 SERIAL controllers can be added to a standard configuration file (provided the limits described in Appendix A of the Global Configurator Manual are not exceeded).

The SERIAL controller allows a computer running Windows NT to function as a multi-user Global workstation by the addition of serial screens (e.g. Wyse-60, Wyse-370 etc.) or a suitable terminal emulator (e.g. Global Windows Workstation, Global PC Workstation etc.).

Important note: The Global Client can only be initiated on the integral screen (i.e. a Global session cannot be started from a serial screen). Furthermore, in order to use Global System Manager (Windows NT) on a serial screen, the Global Client must be running on the integral screen. The Global System Manager window may be minimised but must not be closed while serial screens are in use.

8.3.2.1 SERIAL Global Configurator Options

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 CF-2.4 (sic).

The "Screen number" must match the following numeric subkey in the Registry:

```
$GLMACH\Client\Screens\Serial\n
```

The Windows device_name from the corresponding data value in the Registry will be used to drive the serial console.

For example, the following entry in the configuration file:

```
CONTROLLER [ 2] ( ) :SERIAL Serial console
  TYPE AHEAD BUFFER LENGTH ( 60):
  DISPLAY BUFFER LENGTH ( 500):
  FUNCTION KEY BUFFER LENGTH ( 0):
  SCREEN IMAGE WIDTH ( 132):
  SCREEN IMAGE DEPTH ( 24):
  NUMBER OF STORED ATTR' BYTES ( 1):
  NUMBER OF VIRTUAL PARTITIONS ( 4):
  CHARACTER TRANSLATION ENABLED (Y):
  CONSOLE EXECUTIVE FLAG BYTE (#00):
  Screen number ( 0):1
```

corresponds to the following Registry entry:

Key	\$GLMACH\Client\Screens\Serial\1
-----	----------------------------------

ValueName	Name
Data	COM1

Please refer to the Global Configuration Notes for details of the serial devices that are supported by Global System Manager (Windows NT).

Important note-1: If the "Screen number" is set to 0, the next free \$GLMACH\Client\Screen\Serial\n entry in the Registry will be used to obtain the Name of the serial device.

Important note-2: The serial protocol parameters for the serial line (e.g. baud-rate, number of stop bits, parity and handshaking etc.) are all obtained from the standard Windows settings for the particular serial device. It is NOT possible to alter these settings by modifying the Global Configuration file.

The standard configuration files supplied with Global System Manager (Windows NT) do not include any SERIAL controllers.

8.3.2.2 SERIAL Registry Options

A number of Registry entries parameterise the behaviour of the SERIAL screen controller.

8.3.2.2.1 SERIAL Registry Options affecting All screens

This section describes the ValueNames within the following key:

\$GLMACH\Client\Screens\Serial

The following parameters affect the operation of ALL serial screens.

8.3.2.2.1.1 ReceivePollDivisor

This setting specifies the frequency at which received characters are polled. Note that the ReceivePollDivisor count is only examined during the poll of the transmit buffer, hence the value of the ReceivePollDivisor must be multiplied by the value of the TransmitPollDivisor to obtain the frequency. For example, using the default values of 100 and 10 the keyboard buffer is examined on every 1000th poll. The poll routine is called on every instruction cycle performed by the Cobol interpreter so decreasing the divisor counts will degrade the performance of Global System Manager. The default value is 100.

8.3.2.2.1.2 TransmitPollDivisor

This setting specifies the frequency at which character transmissions are restarted. The poll routine is called on every instruction cycle performed by the Cobol interpreter so decreasing the divisor counts will degrade the performance of Global System Manager. The default value is 10.

8.3.2.2.2 SERIAL Registry Options affecting a Single Screen

This section describes the ValueNames within the following key:

\$GLMACH\Client\Screens\Serial\n

where n is the screen number (i.e. 1 to 99).

The following parameters affect the operation of a single serial screen.

8.3.2.2.2.1 ImmediateDisplay

This parameter specifies whether a display should be performed immediately rather than waiting for the display thread to started naturally by Windows. This setting could improve display performance at the expense of the Cobol interpreter performance. Any of the enable/disable strings defined in Chapter 7 above are valid. The default value is "Off".

8.3.2.2.2.2 Name

This setting specifies the device name of the required port (e.g. "COM1"). This MUST be a port recognised by Windows NT. A list of valid ports can be obtained by using the "Ports" utility in "Control Panel".

Important Note: A final colon character is **NOT** required when specifying the port for a Serial screen controller. For example, use "COM1" rather than "COM1:".

8.3.2.2.2.3 OperatorID

This 4 character string specifies the Global System Manager Operator-id (e.g. ALAN) for the user accessing the serial screen.

Important note: The Global SystemManager Operator-id is case sensitive so that, for example, an operator-id of "ALAN" is considered different from an operator-id of "alan".

If this ValueName is not present in the Registry, the OPERATOR-ID prompt described in section 3.2.2 will appear when you load the Global Client.

8.3.2.2.2.4 TerminalType

This 4 character string specifies the Global System Manager Terminal Type (e.g. 163) for the serial screen.

If this ValueName is not present in the Registry, the TERMINAL TYPE prompt described in section 3.2.3 will appear when you load the Global Client.

8.4 Tape Controller [CF-3.5]

The TAPE CONTROLLER section of a Global System Manager (Windows NT) Client configuration file corresponds to the TAPE CONTROLLER section of the example configuration file described in the Global Configurator Manual.

Only the following controller name is allowed:

TAPE	Tape backup/restore
------	---------------------

8.4.1 TAPE - Standard \$TAPE Controller

The TAPE controller entry in the configuration file is optional - it is not used by \$TAPE!

Important note-1: \$TDUMP is NOT supported with Global System Manager (Windows NT).

Important note-2: The version of \$TAPE must be V7.1, or later.

8.4.1.1 TAPE Global Configurator Options

No controller options are required. The standard configuration files supplied with Global System Manager (Windows NT) do not include a TAPE controller.

8.4.1.2 TAPE Registry Options

The following ValueName must be included in the Registry in order to use \$TAPE on a Global System Manager (Windows NT) Client configuration:

Key	\$GLMACH\Client\Tape
ValueName	Name
Data	tape_device_name

A typical tape_device_name is "Tape0".

In addition to the obligatory ValueName described above, the following optional ValueName appears under the \$GLMACH\Client\Tape key in the Registry.

8.4.1.2.1 NoFilemarkMode

This setting specifies whether the tape controller should read/write filemarks when restoring/saving data. Any of the enable/disable strings defined in Chapter 7 are valid. The default value is "Off".

8.5 Printer Attributes [CF-3.6]

The PRINTER ATTRIBUTES section of a Global System Manager (Windows NT) Client configuration file corresponds to the PRINTER CONTROLLERS section of the example configuration file described in the Global Configurator Manual.

The following controller names are allowed:

DOSPRINT	Direct printer output (DOS.PRI compatible)
WINPRINT	Printer output (via Windows)

8.5.1 DOSPRINT - DOS Compatible Printer Output

The DOSPRINT printer controller prints via a Windows printer device specified in the Registry. This controller is equivalent to the DOS.PRI controller available on Global System Manager (MS-DOS and Windows) and Global System Manager (Novell NetWare) configurations. By modifying the device name in the Registry it is possible to use this controller to print to a named MS-DOS file or to one of a sequence of files in an MS-DOS "spool" directory.

Important note: The use of the DOSPRINT controller when used to print to an MS-DOS device on Global System Manager (Windows NT) configurations can seriously impair performance. This effect is caused by limitations in the essentially "single-user" MS-DOS device drivers. We strongly recommend the use of the "WINPRINT" controller (see section 8.5.2) in multi-user Global System Manager (Windows NT) configurations.

8.5.1.1 DOSPRINT Global Configurator Options

The UNIT NUMBER, DESCRIPTION, HARDWARE FORM FEED, MAXIMUM PAGE DEPTH, TIME-OUT IN TENS OF SECONDS and PRINTER EXECUTIVE FLAG BYTE are all described in CF-3.6. The SPOOLER CONTROL BITS and DEVICE CHARACTERISTICS are not used and should not be modified.

The UNIT NUMBER parameter must be the following numeric subkey in the Registry otherwise the printer unit will not be available:

```
$GLMACH\Client\Printers\DOSPrint\5nn
```

The following ValueName must be included in the Registry in order to access the corresponding printer:

Key	\$GLMACH\Client\Printers\DOSPrint\5nn
ValueName	Name
Data	printer_device_name

A typical printer_device_name is "LPT1:" (see below).

For example, the following entry in the configuration file:

```
CONTROLLER (DOSPRINT ) : Direct printer output
  UNIT NUMBER ( 500):
  DESCRIPTION (Direct Printer Output ) :
  HARDWARE FORM FEED (Y):
  MAXIMUM PAGE WIDTH ( 132):
  TIME-OUT IN TENS OF SECONDS ( 2):
  SPOOLER CONTROL BITS (#00):
  PRINTER EXECUTIVE FLAG BYTE (#FF):
  DEVICE CHARACTERISTICS (#40):
```

corresponds to the following Registry entry:

Key	\$GLMACH\Client\Printers\DOSPrint\500
ValueName	Name
Data	LPT1:

Users familiar with the DOS.PRI printer controller on Global System Manager (MS-DOS and Windows) and Global System Manager (Novell NetWare) configurations may be surprised to discover that several configuration file options are not available for the Global System Manager (Windows NT) DOSPRINT printer. These options are available as Registry settings (see section 8.5.1.2).

The standard configuration files distributed with Global System Manager (Windows NT) include a single DOSPRINT printer controller (unit 500). Up to 50 DOSPRINT printers can be included in a single configuration file. The UNIT NUMBER for a DOSPRINT printer **must** be between 500 - 549, inclusive.

8.5.1.2 DOSPRINT Registry Options

This section describes the ValueNames within the following key:

```
$GLMACH\Client\Printers\DOSPrint\5nn
```

where 5nn is the printer number (e.g. 500).

8.5.1.2.1 Name

This ValueName specifies the printer name and type. Three types of printer are defined (see section 8.5.1.3).

8.5.1.2.2 CreateNewFile

This setting specifies whether the print file should be re-created for each print or appended to. If the print file is recreated then the file will only contain the last Global print report. If the print file

is appended, it will contain the entire accumulation of Global print reports (and will have to be deleted using a Windows command). See section 8.5.1.4 for further details. Any of the enable/disable strings defined in Chapter 7 are valid. The default setting is "Off".

8.5.1.2.3 LFToLFCR

This setting specifies whether a Carriage Return character (#0D) should be sent before each Line Feed character (#0A). Any of the enable/disable strings defined in Chapter 7 are valid. The default setting is "Off".

8.5.1.2.4 A comment on the Raw Mode option

Users who are familiar with the DOS.PRI controller available on Global System Manager (MS-DOS and Windows) and Global System Manager (Novell NetWare) configurations may be surprised at the absence of a "raw mode" option in the Registry. This issue is fully explained in section 8.5.1.3.1.

8.5.1.3 DOSPRINT Operating Notes

The ValueName "Name" described in section 8.5.1.2 is used to specify the DOSPRINT printing mode. Three modes are possible:

Mode	Description
Device	The DOSPRINT printer outputs directly to the device specified. This mode is indicated by terminating the device name with a ":". For example, "LPT1:", "COM1:";
File	The DOSPRINT printer outputs to a specific file. This mode is indicated by setting the device name to a valid filename. For example: "PRINT.TXT";
Spool directory	The DOSPRINT printer outputs to a uniquely named file in the specified "spool directory". This mode is indicated by setting the device name to a valid directory name terminated by the "\". For example: "C:\GSM\SPOOL\".

8.5.1.3.1 DOSPRINT Operating Notes (Device mode)

The device specified by the "name" ValueName in the Registry can be any valid serial or parallel port device name. The setting of the "CreateNewFile" ValueName is ignored when this mode is selected. However, the setting of the "LFToLFCR" ValueName is honoured.

The device is always opened in "raw mode". In "raw mode" all characters are printed from Global System Manager without Windows intercepting or translating them.

8.5.1.3.2 DOSPRINT Operating Notes (File mode)

The device specified by the "name" ValueName in the Registry can be any valid pathname. The setting of both the "CreateNewFile" and "LFToLFCR" ValueNames are honoured when this mode is selected.

If the "CreateNewFile" option is disabled, the DOSPRINT printer appends to an existing file, if one exists. Thus, DOSPRINT may be used to **accumulate** Global System Manager print reports in a named Windows file (if the CreateNewFile option is disabled) or to **export single** print reports to a named Windows file (if the CreateNewFile option is enabled). It is not possible to switch mode for a particular printer

unit without amending the Registry and reloading the Global Client. If both modes are required in a single Global Client session, 2 printer units must be configured.

Important note: Although it is possible to specify a relative pathname for the Windows filename in the Registry (e.g. GSMPRINT.TXT) an absolute pathname (e.g. C:\GSMNT\GSMPRINT.TXT) is **strongly recommended**. An absolute pathname is absolutely essential if the "Set Default Directory" function is executed using the SVC-61 interface.

8.5.1.3.3 DOSPRINT Operating Notes (Spooled Directory mode)

The device specified by the "name" ValueName in the Registry can be any valid directory pathname. The setting of the "CreateNewFile" ValueName is ignored when this mode is selected. However, the setting of the "LFToLFCR" ValueName is honoured.

The specified directory path must exist otherwise the printer controller will be removed dynamically from the configuration when the Global Client is started (i.e. the printer will not appear in the \$U report and an ASSIGNMENT ERROR will occur when attempting to print to the 5nn unit). Every Global System Manager print file will generate a corresponding Windows file with a unique filename in the spool directory. The name of the Windows file will be of the form:

xxxxxxxx.nnn

where xxxxxxxx is the name of the Global print file and nnn is an incrementing sequence number that ensures the Windows filename is unique. The DOSPRINT controller removes all non-alphanumeric characters from the Global filename and converts any lower-case letters to upper-case to generate the first part of the Windows filename. For example, using \$F in partition 2 to create a report (e.g. PRI) produces a Global print file called D.\$F02. This filename will be converted to DF02.nnn (e.g. DF02.001) by the DOSPRINT controller.

If the removal of non-alphanumeric characters in the filename results in an empty string (i.e. if the Global filename includes **no** alphanumeric characters) the first part of the filename is set to "NONAME".

The sequence number is derived from those Windows files that are resident in the MS-DOS "spool directory" when the Global Client is started. The sequence number will start from "001" if the directory is empty. The maximum sequence number is "999". If this limit is reached no more files will be written to the "spool directory" and a Global System Manager "DIRECTORY FULL" error will be reported when attempting to print.

Important note: Although it is possible to specify a relative pathname for the Windows directory in the Registry (e.g. GSMSPPOOL\) an absolute pathname (e.g. C:\GSMNT\GSMSPPOOL\) is **strongly recommended**. An absolute pathname is absolutely essential if the "Set Default Directory" function is executed using the SVC-61 interface.

8.5.2 WINPRINT - Windows Printer Output

The WINPRINT printer controller prints to a Windows print spooler specified. The name of the print spooler may be defined in the Registry or specified at run-time when the print is initiated.

Important note: The use of the WINPRINT controller in conjunction with the Global System Manager spooler (i.e. \$SP, \$SPOOL) is NOT recommended. However, this is not a hard-and-fast rule - it may still be desirable to use the WINPRINT controller with a Global spooler if the \$SP print-file view facility is required.

8.5.2.1 WINPRINT Global Configurator Options

The UNIT NUMBER, DESCRIPTION, HARDWARE FORM FEED, MAXIMUM PAGE DEPTH, TIME-OUT IN TENS OF SECONDS and PRINTER EXECUTIVE FLAG BYTE are all described in CF-3.6. The SPOOLER CONTROL BITS and DEVICE CHARACTERISTICS are not used and should NOT (sic) be modified.

The UNIT NUMBER parameter must be the following numeric subkey in the Registry otherwise the printer unit will not be available:

```
$GLMACH\Client\Printers\WinPrint\5nn
```

The following ValueName must be included in the Registry in order to access the corresponding printer:

Key	\$GLMACH\Client\Printers\WinPrint\5nn
ValueName	Name
Data	printer_name

If the data field in the Registry is blank, a standard Windows Print Dialogue Box will appear every time a Global print is started, allowing the operator to specify the Windows printer device at run-time.

Important note-1: The Printer Dialogue Box is "modal". Consequently, all Global activity (including the operation of any serial screens) will cease while the Print Dialogue Box is displayed.

Important note-2: This dynamic printer name option is NOT available if the user is running the Global Client on a serial screen (see section 8.3.2).

For example, the following entry in the configuration file:

```
CONTROLLER (WINPRINT ) : Spooled printer output
  UNIT NUMBER ( 501):
  DESCRIPTION (Spooled Printer Output ) :
  HARDWARE FORM FEED (Y):
  MAXIMUM PAGE WIDTH ( 132):
  TIME-OUT IN TENS OF SECONDS ( 2):
  SPOOLER CONTROL BITS (#00):
  PRINTER EXECUTIVE FLAG BYTE (#FF):
  DEVICE CHARACTERISTICS (#40):
```

corresponds to the following Registry entry:

Key	\$GLMACH\Client\Printers\WinPrint\501
ValueName	Name
Data	LaserJet4

The standard configuration files distributed with Global System Manager (Windows NT) include a single WINPRINT printer controller (unit 501). Up to 100 WINPRINT printers can be included in a single configuration file.

8.5.2.2 WINPRINT Registry Options

This section describes the ValueNames within the following key:

```
$GLMACH\Client\Printers\WinPrint\5nn
```

where 5nn is the printer number (e.g. 501).

8.5.2.2.1 Name

This ValueName specifies the Windows printer name. If the string is blank, a Windows Print Dialogue Box will be displayed allowing a specific Windows printer to be specified.

8.5.2.3 WINPRINT Operating Notes

The WINPRINT printer interface is flexible and allows 2 basic modes of operation. The operation mode is a function of the printer unit number:

Printer unit	WINPRINT printer mode
500 - 549	Exclusive Mode - the printer is only accessed by a single Global Client (termed the "Printer Client"). In order to access the printer, other Global Clients must print via a Global spooler controller by the "Printer Client";
550 - 598 Global Clients;	Shared Mode - the printer is accessed by several
599 Mode (see above).	Normally reserved but if used, indicates Exclusive

These different modes are reflected in the naming convention for the Printer Control Files (see section 4.2.1.2 for complete details).

8.6 Transport Layer [CF-3.7]

The TRANSPORT LAYER section of a Global System Manager (Windows NT) Client configuration file corresponds to the LAN CONTROLLERS section of the example configuration file described in the Global Configurator Manual.

Only the following mandatory controller name is allowed:

```
SM          System Manager
```

8.6.1 SM - Standard Network Controller

The SM controller entry in the configuration file is mandatory.

8.6.1.1 SM Global Configurator Options

No controller options are required. The standard configuration files supplied with Global System Manager (Windows NT) include an SM controller.

8.6.1.2 SM Registry Options

Global Client networking is parameterised by a number of mandatory entries in the Registry. These entries are normally established when the Global Client is installed (see section 2.2.4.9) but may be modified using the Global Registry Editor (see Chapter 7).

8.6.1.2.1 Global Client NodeID

The following ValueName must be included in the Registry in order to specify the node-id of the Global Client:

Key	\$GLMACH\Client
ValueName	NodeID
Data	node-id

The node-id for a Global Client **MUST** indicate a Global System Manager non-File Server. Allowed decimal values are 27 to 255, excluding 192. Allowed hexadecimal values are 0x1b to 0xff, excluding 0xc0.

8.6.1.2.2 Global Client to Global Server Connection

For every Global Server accessible to the Global Client, a number of ValueNames must be defined which fully define the location and protocol used to access the Global Server. These values are normally established when the Global Client is installed but may have to be expanded if another Global Server is added to a network.

The parameters for a particular Global Server are within the following alphabetic Registry subkey:

\$GLMACH\Client\Servers\x

where x is the Node-id of the Global Server (i.e. "A" to "Z").

The following ValueNames, within the \$GLMACH\Client\Servers\x key specify the network parameters used by the Global Client to access Global Server x.

8.6.1.2.2.1 ProtocolSequence

This setting specifies the protocol used by the particular Global Server to "listen" for procedure calls. Obviously, the Global Client must use the same protocol. For example, if the Global Server is "listening" on the TCP/IP protocol then this value should be set to "ncacn_ip_tcp". See section 2.2.3.4.1 for a complete list of allowed protocols. This value **MUST** agree with the value of a corresponding ValueName in the "Server section" of the Registry on the Server computer (see section 9.6.1.2.2). Note that the protocol specified determines the format of the information supplied in the NetworkAddress and Endpoint values (see below).

8.6.1.2.2.2 NetworkAddress

This setting specifies the network address of the particular Global Server. The format of the network address is dependent on the protocol used (see above). For example, if the Global Server is "listening" for procedure calls via the TCP/IP protocol then the network address value must be set to the dotted decimal address of the computer that is running the Global Server.

8.6.1.2.2.3 Endpoint

This setting specifies the Endpoint value of the particular Global Server. The format of the Endpoint is dependent on the protocol used (see above). See section 2.2.3.4.2 for further details of suggested Endpoints. This value **MUST** agree with the value of a corresponding ValueName in the "Server section" of the Registry on the Server computer (see section 9.6.1.2.2).

8.7 Nucleus Options [CF-2.9]

The NUCLEUS OPTION section of a Global System Manager (Windows NT) Client configuration file corresponds to the NUCLEUS OPTION section of the example configuration file described in the Global Configurator Manual.

The following prompts are described in CF-2.9:

```

SET BTFLAG TO #72 FOR GSM V8.1(#72)
DYNAMIC DC/DF-BLOCK ALLOCATION(Y)
DYNAMIC LOCK TABLE ALLOCATION (Y)
LARGEST SECTOR SIZE
NUMBER OF FILE CHANNELS
NUMBER OF FILE BUFFERS
NUMBER OF FILE BLOCKS
NUMBER OF LOCK TABLE ENTRIES
NUMBER OF PRINT BUFFERS
LENGTH OF PRINT BUFFERS
NUMBER OF PRINT XLATION BUFFERS
NUMBER OF EXTRA ASSIG$ TABLES
MAXIMUM MEMORY ALLOCATION
TARGET STARTUP STRATEGY
IS $REMOTE SUPPORTED?

```

The NUMBER OF PRINT BUFFERS is set to 4 in all standard configuration files distributed with Global System Manager V8.1.

The NUMBER OF PRINT XLATION BUFFERS parameter is not used by Global System Manager (Windows NT) Client configurations. The number of printer translation buffers allocated is always equal to the total number of printers defined in the configuration file (i.e. 2 in all standard configuration files distributed with Global System Manager).

The MAXIMUM MEMORY ALLOCATION is reserved for future use. The default **maximum** amount of Windows virtual memory allocated by each Global Client is 4Mb which should be more than adequate for most configurations. Note that most configurations will require the allocation of significantly less memory than this maximum value.

The \$REMOTE SUPPORTED? flag should be left at N. \$REMOTE is not supported on Global System Manager (Windows NT) Client configurations. The 3 additional \$REMOTE options are unused and should not be altered.

The "Set SYSYSM to 4 for Windows NT" and "Auto date/time sign-on" flags cannot be altered.

Important Note: Disk cacheing is NOT supported on Global System Manager (Windows NT) Client configurations.

8.8 Distribution Options [CF-3.9]

The DISTRIBUTION OPTION section of a Global System Manager (Windows NT) Client configuration file corresponds to the DISTRIBUTION OPTION section of the example configuration file described in the Global Configurator Manual.

You should not attempt to make any changes to this section. The following configuration file parameters are only used when the software is being generated:

BACNAT format

Number of BACNAT diskettes

8.9 Miscellaneous Registry Settings

This section describes a number of Registry settings that don't correspond to any parameters in the Global configuration file.

8.9.1 Internal Version Number Registry Settings

The following special ValueNames contain internal version numbers. These values are documented for completeness only and should never be removed or amended in any way:

Sub-key	ValueName
\$GLUSER	Version
\$GLMACH	Version

The following special sub-key is established when SETUP.EXE is used to install Global System Manager (see section 2.2). This sub-key is ignored by both Global Clients and Global Servers. It is documented for completeness only and should never be removed or amended in any way:

\$GLUSER\Global System Manager\n.n

8.9.2 Global Client Registry setting used during Installation

The special "\$GLMACH\Client\Install" sub-key is used to specify initialisation data for the Global Client when the Master Server is installed. This sub-key is established by the SETUP.EXE installation utility and is only required during the installation of the Master Server.

The following ValueNames, within the:

\$GLMACH\Client\Install

key, are documented for completeness only.

8.9.2.1 NodeID

This value specifies the numeric equivalent of the Global node-id that will be assumed during the installation process. It must indicate a Global Server node-id (i.e. only values in the range 1 to 26 are allowed).

8.9.2.2 DDF0

This value specifies the full pathname of the Discrete Data File "Installation Domain".

8.9.2.3 IDFO

This value specifies the full pathname of the DLV containing the IPL information.

8.9.3 Other Global Client Registry Settings

The following ValueNames, within the:

\$GLMACH\Client

key, parameterise some specialised aspects of the Global Client.

8.9.3.1 DiagnosticDisplays

This setting specifies whether API error displays should be enabled/disabled (the default setting is "disabled"). Every system call made to Windows by the Global Client has the potential to fail. All "well defined" errors (e.g. read error on a diskette, not ready error on a printer, etc.) are reported by Global by displaying the familiar "READ ERROR ON ..." or "NOT READY ERROR ON ..." messages. However, Windows can generate errors which do not have an equivalent Global error. These non-specific errors are reported as a general device error (e.g. "HARDWARE ERROR ON ..." from a printer or "ERROR Z ON ..." from a tape drive). If the DiagnosticDisplays option is enabled these errors are displayed in a special Windows message box which can aid problem investigation. See section C.1.4 for further details regarding the API error box.

8.9.3.2 InstallDirectory

This setting specifies where the Global Client is installed. It is used by the Setup program, SETUP.EXE (see section 2.2.4.3) to determine the location of an existing Global Client installation for upgrade purposes.

8.9.3.3 StatusLinePoll

This setting specifies how often the Global Client will poll the Master Global Server for status line information. The value specified is the duration (in seconds) between successive polls and must be between 1 and 3600. A value of 0 disables the status line poll facility. The default value is 10 seconds.

9. Global Server Configuration

This chapter describes the special considerations that apply when Global Configurator is used to update a Global System Manager (Windows NT) server configuration file. Chapter 8 describes the location and contents of the Global System Manager (Windows NT) client configuration files.

Important note: The Global Server configuration file only contains entries for Direct Access devices. It is NOT possible to configure consoles, printer or tape devices in a Global Server configuration file.

In general, the controller entries that appear within a Global System Manager (Windows NT) Server configuration file refer to corresponding entries in the Registry (see Chapter 7 and Appendix E). Typically, each entry in the Global configuration file corresponds to a ValueName in the Windows Registry. This chapter, which should be read in conjunction with the Global Configurator Manual and Chapter 7 and Appendix E of this manual, explains how information in the Global configuration file is related to data in the Registry. All references to the Global Configurator Manual are of the form CF-n.n.

The final section of this chapter describes those Registry entries that do not correspond to entries in the Global configuration file.

Note that the Registry shorthand convention defined in Appendix E is also used in this chapter, so that the shorthand meta-key:

\$GLMACH

corresponds to the full Registry key:

HKEY_LOCAL_MACHINE\Software\Global

9.1 Machine Name and Bootstrap Messages [CF-3.2]

All Global System Manager V8.1 (Windows NT) Server configurations are level 9 (i.e. BOS/XLAN (sic) or LEVEL9). The same computer architecture code (W), computer machine code (W2) and computer subcode (1) are used for all the current Global System Manager (Windows NT) implementations. The MACHINE NAME and BOOTSTRAP MESSAGE (sic) are as described in CF-3.2.

Important note: The Global Server configurations require a different Action File (i.e. A.W2) from the Global Client configurations (i.e. A.W1).

9.1.1 How to Locate the Global Server Configuration File

The configuration file for each Global Server is called ++5669xx and is installed automatically from a pre-configured volume on the BACNAT media. The special "internal" configuration number 5669 cannot be ordered separately. The Server configuration file and Action File (A.W2) are both present on the special Server SYSIPL volume (e.g. a10, b10 etc.). Any modifications to the configuration file will only affect a single Global Server.

9.2 Data File Definitions [CF-3.3]

The DATA FILE DEFINITIONS section of a Global System Manager (Windows NT) Server configuration file corresponds to the DIRECT ACCESS CONTROLLERS section of the example configuration file described in the Global Configurator Manual.

The following controller names are allowed:

DDF	Discrete data file domain
DISKETTE	Diskette drive
IDF	Integrated data file domain

Important note: The Data File Definitions in the Global Server configuration refer to the network-wide domains (e.g. network DDF unit A00). The Data File Definitions in the Global Client configuration refer to the local domain (e.g. local DDF unit 200). Please refer to section 8.2 for details of the Global Client Data File Definitions.

Note also that a RAM disk is NOT supported on Global System Manager (Windows NT) Server configurations.

9.2.1 DDF - Discrete Data File (Separated Subunit) Domain

The terms "Discrete Data File (DDF)" and "Separated Data File (SSD)" are used synonymously throughout this manual. Simulated volume controller "DDF" uses Windows file functions (e.g. Open, Read and Write) to map a collection of Windows files, within a single Windows directory, to a Global System Manager domain. Each Windows file in the directory corresponds to a single Global System Manager sub-volume. The overwhelming advantage of a Discrete Data File controller over an Integrated Data File controller (see section 9.2.2) is that the size of the domain is not fixed but may be increased dynamically as new sub-volumes (i.e. Windows files) are created.

The naming convention for the Windows directory is GSMnnn where nnn is the domain number (e.g. GSMA00). The files in this directory will be named nnnvvvvv.SVL, where nn is the sub-volume number and vvvvvv is the file name. For example, Windows file 01SYSRES.SVL will correspond to Global System Manager sub-volume A01 (in domain A00), volume name SYSRES. In addition to the sub-volume files, the directory always contains a special header/index file, named 00dddddd.SVL where ddddd is the name of the Global System Manager domain (e.g. SYSDOM). **THE HEADER FILE MUST NEVER BE DELETED.**

Non alphanumeric ASCII characters (e.g. *, ?, !, \$ etc.) are allowed in Global System Manager sub-volume names. These special characters are filtered out by the DDF device driver to ensure that the name of the Windows file corresponding to the Global System Manager sub-volume conforms to the Windows file naming conventions. The Global System Manager sub-volume names that contain special characters, when observed in a Windows directory (e.g. using Windows Explorer command) will appear very different.

The following example illustrates this effect:

Unit	Volume name	Windows file
A01	*TEST!	01TEST.SVL
A02	\$\$WORK	02WORK.SVL
A10	\$\$\$\$\$\$	10.SVL
A68	???MD*	68MD.SVL

If two, or more, Windows files with the same number are present in the Windows directory (e.g. 10PLDATA.SVL and 10SLDATA.SVL) Global System Manager will ignore **ALL** the Windows files with the same "unit number". In this example, if an attempt is made to access sub-volume A10, a "SUB-VOLUME NOT ALLOCATED" error will be displayed. If an attempt is made to list domain 200, an "ERROR Z" will result. Furthermore, a diagnostics error message will appear on the main window of the Global Server process.

The following example illustrates the relationship between Windows directories and files and Global System Manager domain and sub-volumes in a purely artificial configuration that includes DDF controllers (units A00 and A50):

Windows Global Type	Windows Name	Global Type	Unit number	Global Volume
Directory	GSMA00	Domain	A00	
File	00SYSDOM.SVL	Domain	A00	SYSDOM
File	01SYSRES.SVL	Sub-volume	A01	SYSRES
File	02SLDATA.SVL	Sub-volume	A02	SLDATA
File	05LIST.SVL	Sub-volume	A05	LIST
File	49TEST1.SVL	Sub-volume	A49	TEST1
Directory	GSMA50	Domain	A50	
File	00DISK2.SVL	Domain	A50	DISK2
File	01DISK2.SVL	Sub-volume	A51	DISK2
File	49TEST2.SVL	Sub-volume	A99	TEST2

9.2.1.1 DDF Global Configurator Options

When Global Configurator is used to add or amend a DDF controller, no configuration-specific prompts appear in addition to the standard prompts described in section 3.3 of the Global Configurator Manual.

The DRIVE number corresponds to the last character of the following ValueName in the Registry (see Appendix E):

```
Key          $GLMACH\Servers\x\Data\DiscreteDataFiles
ValueName    DDFn
```

where x is the Server node-id (i.e. "A" to "Z").

The DESCRIPTION is explained in CF-3.3. The VOLUME FORMAT, MAXIMUM NUMBER OF FILES, NUMBER OF SUBUNITS and UNIT NUMBERS are also described in CF-3.3. The VOLUME FORMAT **must** be T259Z. **The MAXIMUM NUMBER OF FILES must be left at the default value of 250.** The DRIVE parameter must match a DDFn ValueName in the Registry otherwise the UNIT NUMBER will not be available. The Windows directory_name from the corresponding data value in the Registry will be used to hold the discrete data files.

For example, the following entry in the configuration file:

```
CONTROLLER (DDF ) : Discrete data file domain
  DRIVE ( 0 ):
  DESCRIPTION (Discrete data file domain) :
```

```
VOLUME FORMAT (T259Z ) : Discrete Data File Domain
MAXIMUM NUMBER OF FILES ( 250) :
NUMBER OF SUBUNITS ( 99) :
UNIT NUMBER ( 200) :
```

corresponds to the following Registry entry:

```
Key           $GLMACH\Servers\A\Data\DiscreteDataFiles
ValueName     DDF0
Data          C:\GSMNT\GSMA00
```

Although this domain is configured as unit 200, it will appear as the network address A00.

Discrete Data Files (with every sub-volume corresponding to a file in a Windows directory specified in the Registry) should be used in preference to Integrated Data Files (with the entire domain corresponding to the Windows file specified in the Registry).

The standard Server configuration files supplied with Global System Manager (Windows NT) for systems distributed on diskette include a single DDF controller (format T259Z, unit 200, 99 sub-volumes, 250 files/sub-volume).

Volume format T259Z should be used by the DDF controller. This volume format can be used with Windows partitions up to 2Gb in size (i.e. the highest volume capacity supported by Global System Manager). Note that other (obsolete) DDF volume formats, that only support Windows partitions up to a limit of 512Kb, are available for compatibility with Global System Manager (MS-DOS) configurations. The complete list of Discrete Data File Domain volume types is as follows:

Volume format	Windows size limit	Virtual track size
T151Z	512 Mb	8 Kb
T224Z	512 Mb	8 Kb
T259Z	2 Gb	32 Kb

9.2.1.2 DDF Registry Options

This section should be read in conjunction with Appendix E. Every DDF controller in the Global Configuration file must have a corresponding entry in the Registry otherwise the simulated volume will be removed dynamically from the configuration when the Global Server is started (i.e. the domain will not appear in the \$U report and an ASSIGNMENT ERROR will occur when attempting to access it). The last character of the ValueName for a particular DDF entry in the Registry, which must be a single digit between 0 and 9, corresponds to the DRIVE number for that domain in the Global Configuration file.

For example:

```
Registry Key           $GLMACH\Servers\A\Data\DiscreteDataFiles
Registry ValueName     DDF0
Registry Data          C:\GSMNT\GSMA00
Configuration file     DRIVE = 0

Registry Key           $GLMACH\Servers\B\Data\DiscreteDataFiles
Registry ValueName     DDF1
Registry Data          C:\GSMNT\GSMB50
```

Configuration file DRIVE = 1

Important note: Although it is possible to specify a relative pathname for the Windows directory in the Registry (e.g. GSMA00) an absolute pathname (e.g. C:\GSMNT\GSMA00) is **strongly recommended**.

In addition to DDFn, the following additional ValueNames appear under the \$GLMACH\Servers\x\Data\DiscreteDataFiles key in the Registry.

9.2.1.2.1 HANDLES

This ValueName specifies the maximum number of Windows files the Discrete Data File controller is allowed to open simultaneously. The default value is 10. Note that the same pool of handles is used by all the DDF controllers configured for a particular Global Server (e.g. DDF0, DDF1, DDF2 etc. share the same pool of file handles).

9.2.1.2.1 InactivityTimeout

If the data associated with this ValueName is nonzero, the Global Server will close all Windows files opened by the Discrete Data File controller for a particular domain after a period of inactivity. The timeout period is specified in minutes and must be in the range 1 to 600. A value of 0 (i.e. the default) disables the automatic file closure. Note that an independent timer is maintained for each DDF domain in a multiple-DDF configuration (e.g. DDF0 & DDF1). The timeout period is reset whenever any sub-volume file in the domain directory is accessed. When the timeout period expires all the open files in the domain directory are closed.

9.2.1.3 DDF Windows File Creation

GLDFMAIN.EXE (see section 6.6.1) must be used to create the Windows directory and header file before the DDF controller will recognise a Discrete Data File domain. Note that if GLREGED.EXE is used to Insert a new DDFn Value, the option to run GLDFMAIN.EXE to create the required Windows directory and file will be provided automatically.

Important note: Note that GLDFMAIN does NOT initialise the domain, the \$V "Initialise" function (see section 4.9.3) must be used to prepare the simulated volume for use by Global System Manager.

9.2.1.4 DDF Operating Notes

The size of the 00ddddd.SVL header file (e.g. 00SYSDOM.SVL) within the Windows directory created by GLMKDDF.EXE (see section 6.4.1) MUST match the volume format in the Global System Manager configuration file:

Volume format	Size of 00ddddd.SVL
T151Z	32 Kb
T224Z	32 Kb
T259Z	64 Kb

If the size of the 00ddddd.SVL header file does not match the volume format defined in the configuration file, a "HARDWARE ERROR" will be reported for the DDF controller when Global Server is started and the simulated volume will be removed dynamically from the configuration (i.e. the domain will not appear in the \$U report and an ASSIGNMENT ERROR will occur when attempting to access it). Furthermore, a diagnostics error message will appear on the main window of the Global Server process.

The DDF controller sets the Windows "archive bit" if the contents of any sub-volume are changed. This allows the use of a Windows based archival backup utility with Global System Manager sub-volume files. Note that the Windows file that corresponds to the SYSRES volume (e.g. 01SYSRES.SVL) is ALWAYS updated whenever Global System Manager is started.

Furthermore, the DDF controller checks that all Windows volume files are an exact multiple of the virtual track size. If the size of a Windows volume file is not an exact multiple of the track size then the corresponding Global System Manager sub-volume will be removed. The sub-volume will not appear in the domain listing produced by \$F or \$V and an ERROR Z will be reported at the end of the domain listing. Furthermore, a diagnostics error message will appear on the main window of the Global Server process.

Note that there is no equivalent of the GLEDDF.EXE utility, supplied with Global System Manager (MS-DOS and Windows), that can be used to round-up the size of a Windows sub-volume file to an exact multiple of the virtual track size.

The Windows hard-disk compression feature can cause problems when used in conjunction with Global System Manager because Global System Manager expects the size of the hard-disk to remain fixed whilst it is running. This assumption may be invalid when a disk compression driver is in use: The amount of disk space occupied by a file alters as data is written to it, making it possible for the hard-disk to be filled whilst Global System Manager still reports free space. The DDF controller reports an "INSUFFICIENT SPACE" error if this condition is detected.

The Global System Manager "Long Volume Descriptions" are persistent and are not removed when a Windows sub-volume file is deleted. All the 50 character Long Volume Descriptions for a domain are held in the 00ddddd.SVL domain header file rather than being associated with individual sub-volume data files (e.g. nnnvvvv.SVL). If a sub-volume data file is copied to a data directory using Windows it will automatically inherit the Long Volume Description associated with the corresponding sub-volume number. The same effect occurs if a sub-volume data file is "renumbered" using a Windows file rename operation.

Volume format T151Z for use with Global System Manager (Windows NT) is isometric with volume format T224Z for use with Global System Manager (Unix). Thus, Global System Manager "sub-volume files" can be interchanged, after appropriate copying and renaming, between Global System Manager (Windows) and Global System Manager (Unix).

Important note: Sub-volume files from T224Z Discrete Data File domains can be interchanged with sub-volume files from T151Z domains **provided the number of files per sub-volume is the same for both domains**. Note that the default number of files per sub-volume is 99 for volume format T224Z but 250 for volume format T151Z, although the default value of 99 can be, and often is, overridden by the more sensible value of 250 when using Global Configurator to add volume format T224Z to a configuration file. If a sub-volume file containing a "99 file directory" is copied to a "250 file domain", and Global System Manager restarted, the sub-volume will appear correct in a \$F domain listing and may even appear correct in a \$F sub-volume listing but data

corruption will occur when attempting to access files on the "99 file sub-volume".

Sub-volume files from T151Z (and T224Z) domains can be copied to T259Z domains only if both the source and destination domains are configured with the same number of files per directory (normally 250) AND the "size rounding-up" technique of the GLENDDF.EXE utility (see section 6.4.3 of the Global System Manager (MS-DOS and Windows) Manual) is used. However, the domain header file (i.e. 00ddddd.SVL) from a T151Z domain directory cannot be copied to a T259Z directory thus all Long Volume Descriptions will be lost.

9.2.2 IDF - Integrated Data File (Virtual Hard Disk)

Simulated volume controller "IDF" uses Windows file functions (e.g. Open, Read and Write) to map a single Windows file to a Global System Manager domain. This interface can be very slow for large domains. The IDF controller is available only to access the small IPL DLV's required to initiate the Global Server (i.e. format Z151Z).

Note that the IDF controller may also be required to provide compatibility with existing Global System Manager (MS-DOS) configurations that include an IDF domain (e.g. format P151Z). **The Integrated Data File technique for accessing Windows simulated domains is considered obsolete and has been superseded by the Discrete Data File controller (see section 9.2.1).**

9.2.2.1 IDF Global Configurator Options

When Global Configurator is used to add or amend an IDF controller, no configuration-specific prompts appear in addition to the standard prompts described in section 3.3 of the Global Configurator Manual.

The DRIVE number corresponds to the last character of the following ValueName in the Registry (see Appendix E):

Key	\$GLMACH\Servers\x\Data\IntegratedDataFiles
ValueName	IDFn

where x is the Server node-id (i.e. "A" to "Z").

The DESCRIPTION is explained in CF-3.3. The VOLUME FORMAT, MAXIMUM NUMBER OF FILES, NUMBER OF SUBUNITS and UNIT NUMBERS are also described in CF-3.3. The VOLUME FORMAT for a SYSIPL DLV **must** be Z151Z. The UNIT for a SYSIPL DLV **must** be 110. The various VOLUME START ADDRESS and VOLUME END ADDRESS parameters **must not** be modified. The DRIVE parameter must match an IDFn ValueName in the Registry otherwise the UNIT NUMBER will not be available. The Windows file_name from the corresponding data value in the Registry will be used for the integrated data file.

For example, the following entry in the configuration file:

```
CONTROLLER (IDF ) : Integrated data file
  DRIVE ( 0 ):
  DESCRIPTION (Integrated data file ) :

  VOLUME FORMAT (Z151Z ) : Integrated Data File DLV
  UNIT NUMBER ( 110 ) :
  VOLUME START ADDRESS -
    CYLINDER ( 0 ) : HEAD ( 1 ) : SECTOR ( 0 ) :
```

VOLUME END ADDRESS -
CYLINDER (511) : HEAD (1) : SECTOR (7) :

corresponds to the following Registry entry:

Key	\$GLMACH\Servers\A\Data\IntegratedDataFiles
ValueName	IDF0
Data	C:\GSMNT\GL-A-IPL.DLV

The standard configuration files supplied with Global System Manager (Windows NT) for systems distributed on diskette include a single IDF controller (format Z151Z, unit 110, 250 files).

Although this domain is configured as unit 110, it will appear as the network address a10.

THE SINGLE INTEGRATED DATA FILE CONTROLLER PRESENT IN ALL CONFIGURATION FILES DISTRIBUTED WITH GLOBAL SYSTEM MANAGER (WINDOWS NT) SHOULD NEVER BE DELETED.

9.2.2.1.1 IDF and Integrated Data File Domains

Although it is possible to use the IDF controller to access an Integrated Data File Domain (e.g. volume format P259Z) such a configuration is not recommended. Discrete data files (with every sub-volume corresponding to a Windows file in the directory specified in the Registry - see section 9.2.1) should be used in preference to Integrated Data Files (with the entire domain corresponding to the Windows file specified in the Registry).

The IDF controller is included in Global System Manager (Windows NT) Server configurations solely to support the Integrated Data File DLV (i.e. format Z151Z). However, the IDF controller can be used to access Integrated Data File Domains (see section 8.2.2.1.1 for further details).

9.2.2.2 IDF Registry options

This section should be read in conjunction with Appendix E. Every IDF controller in the Global Configuration file must have a corresponding entry in the Registry otherwise the simulated volume will be removed dynamically from the configuration when the Global Server is started (i.e. the domain will not appear in the \$U report and an ASSIGNMENT ERROR will occur when attempting to access it). Furthermore, a diagnostics error message will appear on the main window of the Global Server process.

The last character of the ValueName for a particular IDF entry in the Registry, which must be a single digit between 0 and 9, corresponds to the DRIVE number for that domain in the Global Configuration file.

For example:

Registry Key	\$GLMACH\Servers\A\Data\IntegratedDataFiles
Registry ValueName	IDF0
Registry Data	C:\GSMNT\GL-A-IPL.DLV
Configuration file	DRIVE = 0

Registry Key	\$GLMACH\Servers\A\Data\IntegratedDataFiles
Registry ValueName	IDF1

```
Registry Data          C:\GSMNT\GSMA50.VOL
Configuration file     DRIVE = 1
```

Important note: Although it is possible to specify a relative pathname for the Windows filename in the Registry (e.g. GL-A-IPL.DLV) an absolute pathname (e.g. C:\GSMNT\GL-A-IPL.DLV) is **strongly recommended**.

In addition to IDFn, the following additional ValueNames appear under the \$GLMACH\Servers\x\Data\DiscreteDataFiles key in the Registry.

9.2.2.2.1 InactivityTimeout

If the data associated with this ValueName is nonzero, the Global Server will close all Windows files opened by the Integrated Data File controller after a period of inactivity. The timeout period is specified in minutes and must be in the range 1 to 600. A value of 0 (i.e. the default) disables the automatic file closure.

9.2.2.3 IDF Windows File Creation

GLDFMAIN.EXE (see section 6.6.2) must be used to create the Windows file before the IDF controller will recognise an Integrated Data File volume. Note that if GLREGED.EXE is used to Insert a new IDFn Value, the option to run GLDFMAIN.EXE to create the required Windows directory and file will be provided automatically.

Important note: Note that GLDFMAIN does NOT initialise the domain, the \$V "Initialise" function (see section 4.9.3) must be used to prepare the simulated volume for use by Global System Manager.

9.2.2.4 IDF Operating Notes

The Windows hard-disk compression feature can cause problems when used in conjunction with Global System Manager because Global System Manager expects the size of the hard-disk to remain fixed whilst it is running. This assumption may be invalid when a disk compression driver is in use: The amount of disk space occupied by a file alters as data is written to it, making it possible for the hard-disk to be filled whilst Global System Manager still reports free space. The DDF controller reports an "INSUFFICIENT SPACE" error if this condition is detected.

9.2.3 DISKETTE - Diskette drive

Up to 2 diskette drives are supported for reading and writing. Diskette formatting is NOT supported by Global System Manager (Windows NT).

9.2.3.1 DISKETTE Global Configurator Options

The DRIVE number must either 0 or 1. The DESCRIPTION is explained in CF-3.3. The VOLUME FORMAT and UNIT NUMBERS are also described in CF-3.3. The only volume format "aN" codes that are supported are "02" (1.44Mb) and "B3" (720Kb). The DRIVE parameter must be 0 or 1 (corresponding to drives A: and B:, respectively). The standard Windows diskette device driver will be used to access the diskette (i.e. there is no need to specify either a Windows device name or a diskette aN code - formats "02" and "B3" are assumed and are automatically selected when a diskette is accessed). For example, the following DISKETTE entry will appear in the configuration file:

```
CONTROLLER (DISKETTE) : Diskette drive
DRIVE ( 0):
```

```

DESCRIPTION (1st diskette drive (A:) :
VOLUME FORMAT ( ) :02A 3" IBM HIGH CAPACITY
UNIT NUMBER ( 140) :
VOLUME FORMAT ( ) :02B "02A WITH 250 FILES"
UNIT NUMBER ( 142) :
VOLUME FORMAT ( ) :B3B 3" APRICOT DS,DD (80T)
UNIT NUMBER ( 170) :

```

Note that there is no one-to-one correspondence between a configuration file DISKETTE controller entry and a "Diskette" key in the Registry.

The standard configuration files supplied with Global System Manager (Windows NT) for systems distributed on diskettes include a single DISKETTE controller with the following formats:

```
B3B 02A 02B
```

9.2.3.2 DISKETTE Registry Options

Access to the local diskette drive(s) is dependent on the data value of the following ValueName in the Registry:

Key	\$GLMACH\Servers\x\Data
ValueName	Diskette
Data	0 Server cannot access the diskette drive(s)
	1 Server can access the diskette drive
	N Reserved for future use - Do not use

If this data value is 0, any diskette drives included in the configuration file will be dynamically removed. The Diskette ValueName in the Registry is required to prevent the possibility of simultaneous access by both a Global Server and a Global Client on the same computer; or by two, or more, Global Servers on the same computer.

Important note: The \$GLMACH\Servers\x\Data\Diskette flag is set to 0, preventing access to the diskette drive via the Global Server, by a standard Global Server installation.

Note also, the Data Type for the "Diskette" ValueName is a REG_DWORD not a REG_SZ (see section 7.1.1.3). Consequently, none of the standard enable/disable strings (e.g. "True", "False") can be used for the strictly numeric "Diskette" value.

9.3 User Display Attributes [CF-3.4]

The USER DISPLAY ATTRIBUTES section of a Global System Manager (Windows NT) Server configuration file corresponds to the CONSOLE CONTROLLERS section of the example configuration file described in the Global Configurator Manual.

Consoles are not allowed in Global Server configurations: This section of the configuration file must be left empty.

9.4 Tape Controller [CF-3.5]

The TAPE CONTROLLER section of a Global System Manager (Windows NT) Server configuration file corresponds to the TAPE CONTROLLER section

of the example configuration file described in the Global Configurator Manual.

Tapes are not allowed in Global Server configurations: This section of the configuration file must be left empty.

9.5 Printer Attributes [CF-3.6]

The PRINTER ATTRIBUTES section of a Global System Manager (Windows NT) Server configuration file corresponds to the PRINTER CONTROLLERS section of the example configuration file described in the Global Configurator Manual.

Printers are not allowed in Global Server configurations: This section of the configuration file must be left empty.

9.6 Transport Layer [CF-3.7]

The TRANSPORT LAYER section of a Global System Manager (Windows NT) Server configuration file corresponds to the LAN CONTROLLERS section of the example configuration file described in the Global Configurator Manual.

Only the following mandatory controller name is allowed:

SM	System Manager
----	----------------

9.6.1 SM - Standard Network Controller

The SM controller entry in the configuration file is mandatory.

9.6.1.1 SM Global Configurator Options

No controller options are required. The standard configuration files supplied with Global System Manager (Windows NT) include an SM controller.

9.6.1.2 SM Registry Options

Global Server networking is parameterised by a number of mandatory entries in the Registry. These entries are normally established when the Global Server is installed (see section 2.2.3.4) but may be modified using the Global Registry Editor (see Chapter 7).

9.6.1.2.1 Global Server NodeID

The Global Server NodeID (i.e. "A" to "Z") is specified by the command line argument to the GLSERVER.EXE command (see section 6.4). This must be specified explicitly using the GLSERVER.EXE command or implicitly using the GLSSTART.EXE command (see section 6.5).

For each Global Server the following key must be specified in the Registry:

Key	\$GLMACH\Servers\x
-----	--------------------

where x is the Server NodeID.

The node_id for a Global Server **MUST** indicate a Global System Manager File Server. Allowed values are "A" to "Z".

9.6.1.2.2 Global Server to Global Client Connection

To allow a Global Server to be accessible by one, or more, Global Clients a number of ValueNames must be defined which fully define the protocol used by the Global Server to "listen" for requested from

Global Clients. These values are normally established when the Global Server is installed but may have to be expanded if another Global Server is added to a network.

The parameters for a particular Global Server are within the following alphabetic Registry subkey:

```
$GLMACH\Servers\x
```

where x is the Node-id of the Global Server (i.e. "A" to "Z").

The following ValueNames, within the \$GLMACH\Servers\x key specify the network parameters used by the Global Server, with a NodeID of x, to "listen" for requests from Global Clients.

9.6.1.2.2.1 ProtocolSequence

This setting specifies the protocol used by the particular Global Server to "listen" for procedure calls. Obviously, the Global Client must use the same protocol. For example, if the Global Server is "listening" on the TCP/IP protocol then this value should be set to "ncacn_ip_tcp". See section 2.2.3.4.1 for a complete list of allowed protocols. This value MUST agree with the value of a corresponding ValueName in the "Client section" of the Registry (see section 8.6.1.2.2). Note that the protocol specified determines the format of the information supplied in the Endpoint value (see below).

9.6.1.2.2.2 Endpoint

This setting specifies the Endpoint value of the particular Global Server. The format of the Endpoint is dependent on the protocol used (see above). See section 2.2.3.4.2 for further details of suggested Endpoints. This value MUST agree with the value of a corresponding ValueName in the "Client section" of the Registry on the Server computer (see section 8.6.1.2.2).

Important note: Unlike the related entries in the Client section of the Registry, there is no need to specify a Network Address in the Server section of the Registry.

9.7 Nucleus Options [CF-2.9]

The NUCLEUS OPTION section of a Global System Manager (Windows NT) Server configuration file corresponds to the NUCLEUS OPTION section of the example configuration file described in the Global Configurator Manual.

The following prompts are described in CF-2.9:

```
SET BTFLAG TO #72 FOR GSM V8.1(#72)
DYNAMIC DC/DF-BLOCK ALLOCATION(Y)
DYNAMIC LOCK TABLE ALLOCATION (Y)
LARGEST SECTOR SIZE
NUMBER OF FILE CHANNELS
NUMBER OF FILE BUFFERS
NUMBER OF FILE BLOCKS
NUMBER OF LOCK TABLE ENTRIES
NUMBER OF PRINT BUFFERS
LENGTH OF PRINT BUFFERS
NUMBER OF PRINT XLATION BUFFERS
NUMBER OF EXTRA ASSIG$ TABLES
MAXIMUM MEMORY ALLOCATION
```

TARGET STARTUP STRATEGY
IS \$REMOTE SUPPORTED?

The NUMBER OF PRINT BUFFERS, LENGTH OF PRINT BUFFERS, NUMBER OF PRINT XLATION BUFFERS, NUMBER OF EXTRA ASSIG\$ TABLES and \$REMOTE SUPPORTED? values are ignored.

The MAXIMUM MEMORY ALLOCATION is reserved for future use and should be left at 0.

The "Set SYSYSM to 4 for Windows NT" flag cannot be altered.

Important Note: Disk cacheing is NOT supported on Global System Manager (Windows NT) Server configurations.

9.8 Distribution Options [CF-3.9]

The DISTRIBUTION OPTION section of a Global System Manager (Windows NT) Server configuration file corresponds to the DISTRIBUTION OPTION section of the example configuration file described in the Global Configurator Manual.

Global System Manager (Window NT) Server configuration files are never used during software generation. Consequently, this section is meaningless. You should not attempt to make any changes to this section.

9.9 Miscellaneous Registry Settings

This section describes a number of Registry settings that don't correspond to any parameters in the Global configuration file.

Note the difference in subkey level between Registry options for a Global Client:

\$GLMACH\Client

and Registry entries for a Global Server:

\$GLMACH\Servers\x

9.9.1 MasterNodeID Registry Setting

The following ValueName, within the:

\$GLMACH\Servers

key, parameterises all Global Servers.

9.9.1.1 MasterNodeID

This setting specifies the Global System Manager "Master Server" Node-id that will be used by all Global Servers configured on the network.

IMPORTANT NOTE: There must be one, AND ONLY ONE, Global System Manager Master Server (normally Server "A") on a Global network. The Master Server Node-id is selected when Global System Manager is installed (see section 2.2.3.5). When a Global Client connects to a Global Server for the first time it checks that it is running on the same Global network. This value must be an upper-case letter in the range "A" to "Z".

This value is normally specified when the Global Server is installed (see section 2.2.3.5).

9.9.2 Other Global Server Registry Settings

The following ValueNames, within the:

`$GLMACH\Servers\x`

key, parameterise a particular Global Server.

9.9.2.1 DiagnosticDisplays

This setting specifies whether API error displays should be enabled/disabled (the default setting is "disabled"). Every system call made to Windows by the Global Server has the potential to fail. All "well defined" errors (e.g. read error on a diskette etc.) are reported by Global by displaying the familiar "READ ERROR ON ..." messages. However, Windows can generate errors which do not have an equivalent Global error. These non-specific errors are reported as a general device error (e.g. "HARDWARE ERROR ON ..." from a diskette). If the DiagnosticDisplays option is enabled these errors are displayed in a special Windows message box which can aid problem investigation. See section C.2.3 for further details regarding the API error box.

9.9.2.2 InstallDirectory

This setting specifies where the Global Server is installed. It is used by the Setup program, SETUP.EXE (see section 2.2.3.2) to determine the location of an existing Global Server installation for upgrade purposes.

9.9.2.3 BootDevice

This setting defines the Global Server's bootstrap device which can be either a "path\directory" to denote a Discrete Data File or a "path\file" to denote an Integrated Data File.

9.9.2.4 MaxCalls

This setting specifies the maximum number of connections that the server 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 GLOBAL SERVER.**

Appendix A - Installation Notes

A.1 Introduction

These notes refer to the prompts and messages produced during the installation of Global System Manager, as indicated by references of the form [A.17], for example. Note that messages which start \$57, \$66, \$78 or \$99 are listed separately in Appendix B.

These notes should be used for reference only, as not all of them will apply to your installation. Chapter 2 describes the installation of Global System Manager in detail.

If you reply Q to the following prompt:

Key <CR> to continue:

the installation will be aborted and a GSM READY: prompt will be displayed. This allows you to run command programs (e.g. \$F, \$V, \$U) in order to check the new system **before** installing Global System Manager. When attempting to run commands on a Starter System please note that the various programs are dispersed amongst several libraries on the BACRES, BEA, HAA diskettes - they are not all held in P.\$CMLB0 on BACRES.

To continue with the installation, provided no unit assignments have been altered, run "INSGSM" from the GSM READY: prompt. For example:

GSM READY: INSGSM

A.2 Standard Installation

This message is documented for completeness only. It should not appear during the installation of Global System Manager (Windows NT).

A.3 Type of Installation

This message is documented for completeness only. It should not appear during the installation of Global System Manager (Windows NT).

A.4 No Valid SYSRES Unit

This message indicates that Global System Manager cannot be installed because there is no suitable hard disk. At least one diskette drive and one hard disk simulated volume are required to install Global System Manager.

This message will appear if the options specified during the BACNAT installation (see section 2.2) did not result in the creation of the required simulated volume. Note that simulated volumes can be created using the Global Data File Maintenance utility (GLDFMAIN.EXE) described in section 6.6.

A.5 Selecting a Unit

This message is documented for completeness only. It should not appear during the installation of Global System Manager (Windows NT).

A.6 Disk Requires Formatting

This message is documented for completeness only. It should not appear during the installation of Global System Manager (Windows NT).

A.7 Disk Will be Formatted - Is This OK?

This message is documented for completeness only. It should not appear during the installation of Global System Manager (Windows NT).

A.8 Overwrite Existing Global System?

There is already a copy of Global System Manager installed on the simulated volume. If you reply Y the existing SYSRES will be overwritten, otherwise Global System Manager will be installed onto a separate sub-volume on the selected simulated volume.

Note that if you want to have two loadable copies of Global System Manager you must use separate discrete data file simulated volumes.

A.9 Destroy Volume-Name?

You are attempting to overwrite a simulated volume on a hard disk which is being used for some other purpose. You must key Y to confirm that this is what you intend.

A.10 Specify SYSRES Unit

This message is documented for completeness only. It should not appear during the installation of Global System Manager (Windows NT).

A.11 Which Disk To Bootstrap From

This message is documented for completeness only. It should not appear during the installation of Global System Manager (Windows NT).

A.12 Domain xxxxxx will be initialised

This message indicates that the simulated volume requires initialising before it can be used. Initialising the simulated domain will destroy any data currently on the disk. **Note that the default reply to the following prompt is N to prevent accidental deletion of Global System Manager data:**

This will DESTROY any existing data.
Key Y if it is OK to continue (N):

Important note: If the reply to this prompt is <CR> or N, it will be repeated (since a standard installation does not offer any alternative installation domains). If you do not want to continue with the installation, key Q to produce the GSM READY: prompt.

A.13 Computer Identification Letter

This message is documented for completeness only. It should not appear during the installation of Global System Manager (Windows NT).

A.14 System Unit On Master

A Global System Manager (Windows NT) network configuration must have a designated Master Server, where details of users (i.e. operators) currently using Global System Manager can be held. **THE MASTER SERVER MUST ALWAYS BE SERVER A.**

You must specify the unit address which Global System Manager occupies on the Master Server (SYSRES). This is usually A01.

A.15 Terminal Code

If your computer has serially connected screens then you must specify what type they are, so that the appropriate information can be installed. Each type of screen is identified by a number of up to three digits, and these can be listed by keying L to the prompt. You can specify up to four terminal types. When you have specified all you need key E. Note that it is easy to install further terminal types when the system has been installed by running the \$CUS System Maintenance option.

A.16 Memory Allocation

This message is documented for completeness only. It should not appear during the installation of Global System Manager (Windows NT).

A.17 Insufficient Space

There is insufficient contiguous free space on the hard disk to install Global System Manager. Normally this can only happen if you're re-installing Global System Manager. The error message indicates how much space is needed.

If there is enough space for the command programs but not for all the user partitions required, then you will be given the option of installing a restricted system, which will support fewer partitions. Because the size calculations are slight overestimates it is possible that this system may be completely satisfactory. If, however, there is not enough space you will be warned that the number of users is being reduced when you bootstrap the new system. If you then use \$REORG to increase the size of the SYSRES unit by a suitable amount it will be possible to bootstrap a full system.

A.18 Existing SYSRES Unit is nnnnKb Too Large

There is more space allocated to the unit onto which Global System Manager is to be installed than is needed. If you reply Y the unit will be re-allocated to release the excess space, otherwise it will be left at its current size. You may want to have a larger than standard SYSRES if extra menus are required.

A.19 Diskettes Required

This message is documented for completeness only. It should not appear during the installation of Global System Manager (Windows NT).

A.20 Specify size of SYSRES (minimum of xxxxK)

The size of the SYSRES unit may be increased from the default to allow for extra menus, or to provide room for additional swap files. Note that the reply is NOT automatically multiplied by 1024 to obtain a size in Kb.

The reply may be suffixed by K (to specify a size in Kilobytes), M (to specify a size in Megabytes) or G (to specify a size in Gigabytes).

A.21 Date Format

Global System Manager supports two date formats: European, dd/mm/yy; and American, mm/dd/yy. For example, the date 6th February 1956 is represented as 06/02/56 (European format) or 02/06/56 (American

format). Whichever format you chose will be used automatically by any Global software to input and display dates.

A.22 Password Checking

This message is documented for completeness only. It should not appear during the installation of Global System Manager (Windows NT).

A.23 Menu

This message is documented for completeness only. It should not appear during the installation of Global System Manager (Windows NT).

The default menu (for Global System Manager **without** Speedbase Presentation Manager) contains the following entries:

```
Install Global Software
GSM Utilities
```

The default menu (for Global System Manager **with** Speedbase Presentation Manager) is described in section A.38.

The "GSM Utilities" sub-menu contains the following options:

```
Volume Maintenance
Directory Maintenance
System Status
File Inspection
Start Spooler
Check Spooler Status
Menu Maintenance
Sign off
Terminate Process
Exit
```

A.24 The Spooler

The Spooler (see Chapter 8 of the Global System Manager Manual) allows a printer to be shared between several users. This is achieved by writing all reports to a special disk unit, the spool unit, rather than directly to the printer. The reports are printed off by a program called the spooler (command \$SP) which typically is running all the time in a background partition. Note that it is still possible to print reports directly if the spooler is not printing.

As well as allowing you to share the printer, the spooler gives you more control over the printing of reports. You can 'hold' some reports for printing later, give others high priority, or print multiple copies. There is also a spooler status command, \$SPS, that allows you to re-schedule printing in this way from screens other than the one running the spooler.

You must specify the unit address and size of the spool unit to be allocated. The default unit is the next free unit on the disk after SYSRES (e.g. if SYSRES is unit 210, the default spool unit will be 211). This is usually satisfactory, but on a network you may want to use a spool unit on another computer, in which case you should supply its address to the prompt. The size must be sufficient to hold all the reports waiting to be printed. As a guide, a typical report of 50 pages will occupy about 400 Kbytes. Clearly, if you intend holding a

lot of reports without printing them you will need a larger unit than if you intend to print everything immediately.

Important note to users of the Global Cobol Development system: The size of the spool unit for Global System Manager V8.1 should be larger than for earlier versions of Global System Manager to accommodate the larger listing files produced by the V8.1 Global Cobol compiler.

The following prompt allows you to specify the size of the spool unit:

[A.24] Size of spool unit (*nnnnK*):

The reply may be suffixed by K (to specify a size in Kilobytes), M (to specify a size in Megabytes) or G (to specify a size in Gigabytes).

A.25 Selecting a Printer Unit

If you intend attaching more than one printer, you should specify the unit to be used for plain paper printing, as this unit will be used (unless overridden) for any report not on special stationery. If you have installed the spooler, then it will print reports to this printer.

A.26 Printer Busy Handling

This message is documented for completeness only. It should not appear during the installation of Global System Manager (Windows NT).

A.27 Printer Baud Rate

This message is documented for completeness only. It should not appear during the installation of Global System Manager (Windows NT).

A.28 Domain Error Map

This message is documented for completeness only. It should not appear during the installation of Global System Manager (Windows NT).

A.29 Standard Printer Control Files

This prompt will not appear during the installation of Global System Manager V8.1. No Printer Control Files (see section 6.1.3.3 of the Global System Manager Manual) are installed.

A.30 Menu Entry For Menu Maintenance

This message is documented for completeness only. It is obsolete and should not appear during the installation of Global System Manager (Windows NT).

A.31 Event Logging Installation

During the Master Server installation, you are asked whether you want the event logging software installed. Event logging is fully described in the Global Utilities Manual. If you answer Y you will be prompted for the size of the master event log file, given a default of 200 Kbytes. The installation will allocate a unit called SYSLOG which will contain the event logging programs (about 160 Kbytes), a master event log file \$MLOG of the size given and leave free space of 1/5 of the size of \$MLOG for the event logging file \$LOG. An insufficient space message will be given if a unit cannot be allocated of the required size.

The following prompt allows you to specify the size of the SYSLOG volume:

```
[A.31] Specify size of master event log file (200K):
```

Note that the reply is NOT automatically multiplied by 1024 to obtain a size in Kb.

The reply may be suffixed by K (to specify a size in Kilobytes), M (to specify a size in Megabytes) or G (to specify a size in Gigabytes).

If you are not installing the Master Server then you will be asked if event logging is installed on the Master Server. If the answer is Y you will further be prompted for the LAN unit address of the SYSLOG unit on the Master Server which will have been allocated as part of the Global System Manager installation onto the Master Server.

To de-activate Event Logging at any time after Global System Manager has been installed, simply remove the \$LG logical unit assignment using the \$CUS "Permanent Unit Assignment" Customisation.

A.32 Century Start Year

This prompt gives you the option to change the year before which dates are regarded as being in the 21st century rather than the 20th (see section 6.1.2.12 of the Global System Manager Manual for further details).

A.33 Work Space Allocation

This message is documented for completeness only. It should not appear during the installation of Global System Manager (Windows NT).

A.34 Install Operator Groups

The operator group option is fully described in the Global Utilities Manual. If you answer Y, the installation will create an empty group file (\$\$GROUP) of size 200Kb on the SYSRES sub-volume (i.e. on logical unit \$M).

A.35 Is the Mailing System Installed on the Master Computer

If the installation is not on the Master Server then you will be asked if the Global System Manager mailing system is installed on the Master Server. If the answer is Y you will further be prompted for the LAN unit address of the SYSML unit on the Master Server which will have been allocated as part of the Global System Manager installation onto the Master Server (see A.37, below).

A.36 Disk Requires Partitioning

This message is documented for completeness only. It should not appear during the installation of Global System Manager (Windows NT).

A.37 Install Mailing System

During the Master Server installation, you are asked whether you want the Global System Manager mailing software installed. The Global System Manager mailing system (\$MAIL) is fully described in the Global Utilities Manual.

If you answer Y you will be prompted for the size of the Mail unit, given a default of 1 Mbyte. The installation will allocate a unit called SYSML which will contain an empty \$\$MAIL file of maximum size (i.e. default 1Mb). An insufficient space message will be given if a unit cannot be allocated of the required size.

The following prompt allows you to specify the size of the mail unit:

[A.37] Size of mail unit (nnnnK):

The reply may be suffixed by K (to specify a size in Kilobytes), M (to specify a size in Megabytes) or G (to specify a size in Gigabytes).

A.38 Install Speedbase Presentation Manager

Speedbase Presentation Manager V8.1 MUST be installed during the installation of Global System Manager. **Unlike pre-V8.1 versions of Speedbase Presentation Manager, it is NOT possible to use \$INSOFT or run EPINS from the EPA distribution diskette.** If your software is for a Global System Manager PM configuration, key Y to install Speedbase Presentation Manager.

If Speedbase Presentation Manager is installed, the default menu (see section A.23) will contain the following options:

Install Global Software
GSM Utilities
Speedbase Utilities

A.39 Install Speedbase Demonstration System

The installation of the Speedbase Presentation Manager demonstration software is optional. If you select to install the demonstration software you will be prompted for a sub-volume on which to install the demonstration data.

Important note: The sub-volume selected must already be allocated on the hard-disk. The installation of the Speedbase Demonstration System will NOT allocate a new sub-volume automatically.

A.40 Save Current Global System Manager Customisation

If you are upgrading to Global System Manager V8.1 from Global System Manager V7.0 or V8.0 you have the option of saving the current Global System Manager customisation before installing. If this option is selected a BACSAV sub-volume will be allocated of the same size as the existing SYSRES. All the files on the existing SYSRES will be copied to BACSAV before Global System Manager is installed, overwriting the existing SYSRES.

A.41 Insufficient Space for a Save Unit

There is insufficient space to allocate a BACSAV sub-volume to save the contents of the existing SYSRES (see A.40, above). If you choose to continue with the installation the current Global System Manager customisation will NOT be saved.

A.42 Existing Customisation will be restored

This option only appears if you selected to save the existing Global System Manager customisation prior to installing Global System Manager V8.1 (see section A.40, above).

If you choose to restore the customisation, the files listed in section 2.3.5 will be copied from the BACSAV sub-volume to the new SYSRES sub-volume.

Furthermore, if the save/restore existing customisations option is selected then it is NOT possible to apply the new V8.1 customisation options (e.g. \$GROUP - see A.34; \$MAIL - see A.37) during the installation of Global System Manager. These customisations must be applied using the "Install ExtraFacilities" option of \$CUS as explained in section 6.1.4.13 of the Global System Manager Manual.

Appendix B - Installation Error and Warning Messages

The messages listed in this appendix appear when you attempt to startup, sign on to or use Global System Manager which has been invalidly customized, has had its configuration file wrongly updated by Global Configurator, or has been incorrectly generated. Those messages designated as errors are fatal and prevent Global System Manager from being loaded. Warnings are less severe and normally allow a degraded system with missing features to operate so that you can use Global System Manager itself to analyse the problem. A warning message should never be ignored unless the documentation indicates it is to be expected.

All messages that appear in Windows Message Boxes are listed separately in Appendix C.

The following notes are referred to from the message descriptions overleaf:

Note 1. This condition is documented for completeness only to assist the TIS Software staff responsible for software generation and porting Global System Manager to new operating systems. If it does occur it indicates that the system has been incorrectly or incompletely generated, or there is an internal error in the installation jobs.

Note 2. When there is insufficient space to load a program this may be due to you specifying too large a system stack or too small a memory bank. You may need to re-install Global System Manager.

Note 3. If an error occurs on a distribution volume (i.e. BACRES, BEA or HAA) you will normally have to obtain a new set of diskettes before you can proceed. If the error is on a system volume you should either restore the volume from a backup, or re-install Global System Manager.

\$57 INITIATION WARNING 1 - FILE name NOT FOUND
\$57 INITIATION WARNING 2 - FILE name HARD ERROR H
\$57 INITIATION WARNING 3 - FILE name CORRUPT
\$57 INITIATION WARNING 4 - FILE name READ ERROR

These messages appear if a problem occurs during the startup process when attempting to load the named machine-specific file. Note 1 applies to warning 1. Warning 2 usually indicates a drive electronics error rather than a media error, and if it persists after retrying the startup process several times the drive should be serviced. Note 3 applies to warnings 3 and 4. If a target system volume is affected it will be the SYSRES volume.

\$57 INITIATION WARNING 5 - FILE name MISSING DEVICE

The physical device or simulated volume associated with a particular nucleus file is not present on this computer. This usually indicates that the software has been supplied with a configuration file which describes a configuration which is a superset of the current one. For example, the configuration file might support both 3½" and 5¼" diskette drives whereas the

computer you are working with possesses just one diskette drive. The message appears only when the starter system is loaded and is suppressed during the loading of the target system to avoid an unnecessary warning when the reason for it is understood. The file name indicates the type of missing device:

```
+W1CAxx  direct access device
+W1CBxx  screen
+W1CExx  printer
+W1CFxx  local area network
```

\$57 INITIATION WARNING 6 - FILE name ERROR x

Note 1 applies to this message. An unexpected problem, not covered by the previous 5 warnings, has occurred when accessing the indicated file. The error code is a single letter whose meaning is given under "\$99 ERROR x ..." see below.

\$57 INITIATION ERROR 10 - UNABLE TO LOAD P.\$MON

uuu

e

Note 1 applies to this message. It was not possible to open the monitor overlay library. This may be because of illegal use of the \$F INS or PIP instructions. The attempt to open P.\$MON from unit uuu failed with an error of type e.

\$57 INITIATION ERROR 11 - UNABLE TO LOAD P.\$MON INDEX

e

Note 1 applies to this message. It was not possible to read the monitor overlay library index. This probably means that the library is corrupt. The attempt to read the library index failed with an error of type e.

\$57 INITIATION ERROR 12 - UNABLE TO READ MONITOR OVERLAY

e

Note 1 applies to this message. It was not possible to read the monitor overlay from the P.\$MON library. This probably means that the library is corrupt or incomplete. The attempt to read the library failed with an error of type e.

\$57 INITIATION ERROR 13 - UNABLE TO CREATE MONITOR PAGE

Note 1 applies to this message. It was not possible to load an overlay from P.\$MON into a monitor page. This error will occur if the number of monitor pages has been reduced by injudicious use of the \$F PAM instruction.

\$57 INITIATION ERROR 14 - UNABLE TO LOAD P.\$PAGES

e

Note 1 applies to this message. It not possible to read the monitor overlay library P.\$PAGES. This maybe because of illegal use of the \$F INS or PIP instructions. The attempt to open P.\$PAGES failed with an error type e. It is still possible to initiate Global System Manager but attempts to run some command programs will result in PGM CHK-8.

\$57 INITIATION ERROR 55 - STOP -98 ON ODD BOUNDARY

Note 1 applies to this message. An error has occurred when loading the monitor file (\$MONITOR).

\$57 INITIATION ERROR 60 - MONITOR AND COMMAND LIBRARY INCOMPATIBLE

This error usually indicates that you are using a SYSIPL diskette which is incompatible with the SYSRES disk. They contain different versions of Global System Manager.

\$57 INITIATION ERROR 61 - INVALID GENERATION

The serial code keyed in response to the "please key serial code" prompt, though a valid code, did not match the software on the disk. Try again in case you mis-keyed the number. If the error occurs again, it probably indicates an error in the generation of Global System Manager, and you will need to obtain replacement disks.

\$57 INITIATION ERROR 101 - \$STARC I/O ERROR

\$57 INITIATION ERROR 102 - \$STARC NOT FOUND

The startup process has been unable to load the main sign-on procedure overlay, \$STARC, from the command library on BACRES (starter system) or SYSRES (target system). If the error is on SYSRES either restore it from a backup or re-install Global System Manager. See Note 3.

\$57 INITIATION ERROR 103 - \$STARC TOO LARGE

This error terminates the startup process because there is insufficient space to load the main sign-on procedure overlay. See Note 2.

\$57 INITIATION ERROR 151 - INITIATION INCOMPLETE

This error, which terminates the startup process, will occur if you key <CTRL W> to interrupt it before the process is complete. The message will not appear immediately you key <CTRL W>, but will occur at the point at which the ready prompt would normally be output.

**\$57 INITIATION WARNING 201 - TOO MUCH MONITOR IS SWAPPED
SWAP UNIT WOULD HAVE BEEN nnn**

Note 1 applies to this message. The initiation of memory by the system has not been properly completed.

**\$57 INITIATION WARNING 203 -
NOT ENOUGH ROOM FOR ALL USERS ON SWAP FILE OF SIZE ssssss
SYSTEM OF pp PARTITIONS POSSIBLE
IS THIS OK?:**

There is insufficient room on the unit assigned to \$SW (normally SYSRES) for a swap file large enough to hold information for all the users of this system. This may occur if you change the configuration using \$CUS (Configuration Maintenance) or Global Configurator.

If you reply Y or <CR> to the outstanding prompt Global System Manager will continue by initiating a restricted system as indicated by the message. A response of N also causes the startup process to continue, but in this case only a single-user system will be initiated.

If the system as loaded is satisfactory but you wish to prevent this prompt appearing in the future, you should run \$CUS and decrease the number of users as described in Chapter 6 of the Global System Manager Manual.

To support the full number of users you must use \$REORG to increase the size of SYSRES by at least (memory bank size * number of extra users needed) bytes. An alternative is to establish a separate sub-volume for swap files (by convention called \$\$SWAP) of the required size, and then use the \$CUS Permanent Unit assignments option to reassign \$SW to the address of this unit.

\$57 INITIATION WARNING 205 - IRRECOVERABLE ERROR ON \$\$SWAP FILE - x

An irrecoverable error has prevented the swap file from being used. The single character at the end of the message indicates the type of error: R or W indicate an I/O error on the disk; S indicates that the disk is full. The startup process continues, but only a single user system will be initiated. See Note 3.

\$57 INITIATION WARNING 206 - SWAP FILE ERROR 2

\$57 INITIATION WARNING 207 - SWAP FILE ERROR 3

\$57 INITIATION WARNING 208 - COMMAND \$STARN OR \$STARO CANNOT BE LOADED

These warnings indicate that internal consistency checks within the startup process have failed. Note 1 applies. The startup process continues but only a single-user system will result.

**\$57 INITIATION WARNING 209 - NO TIMER AVAILABLE
SWAP UNIT WOULD HAVE BEEN nnn**

You have attempted to run a multi-user system on a computer which does not support a timer. The startup process continues, but only a single-user system will result.

\$57 INITIATION WARNING 210 - TOTAL NUMBER OF PARTITIONS EXCEEDS 99

The configuration file has become corrupt.

\$57 INITIATION WARNING 251 - program CANNOT BE LOADED

This warning appears if you have used customization to include the indicated program in the system stack, but this is not possible. If an I/O error prevented the program from being loaded the warning will be preceded by an explanatory message. Otherwise the problem is either due to the program (or command) not being present on the device assigned to \$P (or \$CP), or to there being insufficient room in the system stack for it. Global System Manager will continue as though the customization had not taken place.

\$57 INITIATION WARNING 302 - \$MONITOR VERSION x; \$STARC VERSION y

This warning message indicates that the version code of the monitor is not the same as that associated with Global System Manager command library. See Note 1. The startup process continues unaffected.

\$57 INITIATION ERROR 303 - CANNOT BOOTSTRAP FROM V.R.K

This message should not occur and is documented for completeness only.

\$57 INITIATION ERROR 35x - USER FILE ERROR

This indicates that an error has occurred on the user file when initiating a multi-user system. If it is an I/O error affecting the file itself the warning will be preceded by an error message. Otherwise SYSRES is probably corrupt and should be restored. See Note 3.

\$57 INITIATION ERROR 36x USER FILE ERROR

This indicates that an error has occurred on the user file when initiating a multi-user system. If it is an I/O error affecting the file itself the warning will be preceded by an error message. Otherwise SYSRES is probably corrupt and should be restored. See Note 3.

\$57 INITIATION ERROR 360 - NO ROOM FOR PROCESSOR IN USER FILE

The user file has become fragmented so that there is not a contiguous range of user numbers available, and in consequence it is not possible for this processor to join the network. The user file has been marked as requiring reorganization, but this cannot be done until the master computer is restarted, when it will happen automatically.

\$57 INITIATION ERROR 363 - INITIALISING MORE THAN MAXIMUM NUMBER OF USERS

See error 369.

\$57 INITIATION WARNING 364 - CANNOT INITIALISE ALL USERS

There is insufficient space in the system to initialise all the users so a reduced number of users will have been initialised. This may happen because the user file is too small. The user file can be extended by using the \$STATUS command to purge the user file, allocating a larger size, and then restarting the system again.

\$57 INITIATION ERROR 368 - INCOMPATIBLE CONFIGURATION

The software level defined by the configuration file is incompatible with the software level of Global System Manager. This is probably caused by changing your configuration file to a higher level of Global System Manager.

\$57 INITIATION ERROR 369 - MORE THAN PERMITTED NUMBER OF USERS

Global System Manager has been generated for a maximum number of users. This error will occur if more than the maximum number of

users have been configured. This may occur if more screens have been added to the configuration file, or the number has been exceeded by more users joining a network. If you require more screens you must obtain an upgraded system.

\$57 INITIATION WARNING 370 - LOG FILE IS NEARLY FULL

The log file, \$\$LOG on unit \$LG, is nearly full (i.e. there is space for less than 50 records in the logfile). When this message appears, it is prudent to use the \$LOG command to purge the log-file.

To de-activate Event Logging at any time, simply remove the \$LG logical unit assignment using the \$CUS "Permanent Unit Assignment" Customisation.

\$57 INITIATION WARNING 371 - LOG FILE IS FULL

The log file, \$\$LOG on unit \$LG, is full. No more events will be logged until the \$LOG command is used to purge the log-file.

To de-activate Event Logging at any time, simply remove the \$LG logical unit assignment using the \$CUS "Permanent Unit Assignment" Customisation.

\$57 INITIATION WARNING 372 - UNABLE TO LOCK USER FILE

DO YOU WISH TO TRY AGAIN (Y)

\$57 INITIATION WARNING 373 - UNABLE TO UNLOCK USER FILE

DO YOU WISH TO CONTINUE (Y)

The system is unable to lock or unlock the user file. This can occur if another computer on the network is in the process of initiating Global System Manager or a utility (e.g. \$STATUS or \$BYE) is being run on the network which temporarily requires exclusive use of the user file. If you key "Y" in reply to the prompt the lock or unlock operation will be retried. A reply of "N" will cause initiation to be abandoned and the system will need to be restarted. If either of these warnings occur check that no other operators are using \$STATUS or \$BYE.

\$57 INITIATION ERROR 374 - BOOTSTRAP ABANDONED

This message appears if "N" has been keyed to warnings 372 and 373.

\$57 INITIATION WARNING 375 - UNIT ALIASING FAILURE

An error has occurred during the calculation of the aliases for units 100 - 108. This problem may occur if the 100 unit stored in \$MONITOR has not been patched correctly using the \$F PAM instruction.

\$57 INITIATION WARNING 401 - CUSTOMISATION HAS INCREASED COUNT OF SCREENS

\$57 INITIATION WARNING 402 - CUSTOMISATION HAS INCREASED COUNT OF USERS

The user details customization instruction has either increased the number of normal users beyond the maximum number of screens the configuration supports, in which case warning 401 appears, or

has increased the total number of users beyond the maximum defined in the configuration file. This error usually results from changing the configuration file to contain fewer screens or users. A single user system will be initiated so that you can change the erroneous user details customization.

\$57 INITIATION WARNING 403 - S-USER CUSTOMISATION OF M-USER NUCLEUS

This warning appears if user details customization has reduced the number of users of a multi-user system to just one. In this case the startup process will continue but only a single-user system will be initiated.

\$57 INITIATION WARNING 404 - M-USER CUSTOMISATION OF S-USER NUCLEUS

This warning appears, together with either warning 401 or 402, if you employ user details customization to set the number of users of a single-user system to more than 1. See the notes accompanying warnings 401 and 402.

\$57 INITIATION WARNING 405 - BANK CUSTOMISATION INVALID IN S-USER BOS

This message occurs on a single user system when the number of memory banks has been customised into the monitor. This customisation is ignored for single user initiation.

\$57 INITIATION WARNING 407 - TINT CUSTOMISATION INVALID IN S-USER BOS

This message occurs on a single user system when the time slice interval has been customised. This customisation is ignored for single user initiation.

\$57 INITIATION WARNING 409 - WIDTH OF PRINTER 5xx NOW nnn

This warning appears if you have attempted to increase the line width of the indicated printer past the maximum (nnn) established when your system was generated. Your request will be ignored and the width will be set to the maximum allowable, as indicated by the message.

\$57 INITIATION WARNING 410 - CUSTOMISATION OF NON-EXISTENT PRINTER 5xx

You have mistakenly used customization to modify the printer attributes of the unit whose address appears in the message, but that unit is not supported as a printer on your configuration. The spurious customization is ignored.

\$57 INITIATION WARNING 411 - CUSTOMISATION INCREASE OF CBOS SCREENS

\$57 INITIATION WARNING 412 - CUSTOMISATION INCREASE OF CBOS PARTITIONS

These are equivalent to messages 401 and 402, but for a single-screen configuration.

\$57 INITIATION ERROR 413 - CANNOT BOOT WITH THIS VERSION OF USER FILE

The user file present on the master is incompatible with the present system. It is essential to make sure that all computers on a network are running compatible versions of Global System Manager.

\$57 INITIATION WARNING 414 - INAPPROPRIATE VERSION OF USER FILE

The user file present on the master is inappropriate but not incompatible. It is possible for initiation to proceed but it is advisable to ensure that all computers on a network are running compatible versions of Global System Manager.

\$57 INITIATION WARNING 450 - INVALID TERMINAL TYPE

The TAP supplied from the host operating system does not exist or has not been installed.

**\$57 INITIATION WARNING 460 - NO GUI LICENCE
(PLEASE CONTACT YOUR SOFTWARE SUPPLIER)**

This message is documented for completeness only. It should not appear during the installation of Global System Manager (Windows NT).

**\$57 INITIATION WARNING 461 - GUI LICENCE EXCEEDED
(PLEASE CONTACT YOUR SOFTWARE SUPPLIER)**

This message is documented for completeness only. It should not appear during the installation of Global System Manager (Windows NT).

\$57 INITIATION ERROR 462 - INCOMPATIBLE NUCLEUS

You have attempted to use the Global Windows Workstation with a pre-V8.1 nucleus. This is not allowed.

\$57 INITIATION WARNING 5xx - USER FILE ERROR DURING SIGN-ON

This indicates that an error has occurred on the user file when initiating a multi-user system. The xx number in the warning code indicate the File Executive operation that suffered the error. If it is an I/O error affecting the file itself the warning will be preceded by an error message.

\$57 INITIATION WARNING 501 - USER FILE ERROR DURING SIGN-ON

This indicates that an error has occurred on the user file when initiating a multi-user system. The error has occurred in the OPEN operation. If it is an I/O error affecting the file itself the warning will be preceded by an error message.

\$57 INITIATION WARNING 510 - USER FILE ERROR DURING SIGN-ON

This indicates that an error has occurred on the user file when initiating a multi-user system. The error has occurred in the CLOSE operation. If it is an I/O error affecting the file itself the warning will be preceded by an error message.

\$57 INITIATION ERROR 55x - MEMORY BANK INITIATION, DISK ERROR

There has been an I/O error on the swap file during the initiation of the memory banks. Error codes 551, 552 and 553 indicate an error opening the swap file. Error codes 554, 555 and 556 indicate an error on the first read of the swap file. Error

codes 557, 558 and 559 indicate an error on subsequent reads of the swap file.

\$57 KEY NEW SYSRES UNIT:

It is not possible to access the SYSRES unit, usually because of a network error. You should supply the address of SYSRES on another computer (if there is one on the network) which your computer can access to initiate Global System Manager from. If there isn't one then the network will have to be reconfigured using the system maintenance function of \$CUS (see Chapter 6 of the Global System Manager Manual).

\$57 MASTER COMPUTER UNAVAILABLE

\$57 KEY UNIT OF SYSRES ON NEW MASTER COMPUTER:

You have tried to initiate a Global System Manager network configuration and the master computer, which contains the user file necessary for sign-on, is not running Global System Manager. If Global System Manager can be initiated on the master computer, do so and then key <CR> to continue initiating Global System Manager on your computer. If Global System Manager cannot be initiated on the master computer, then you will have to supply the address of SYSRES on another computer which can serve temporarily as the new master computer. You will then have to initiate Global System Manager on that computer before you can continue initiating Global System Manager on your computer. If the master computer is permanently disabled the network will have to be reconfigured using the system maintenance function of \$CUS (see Chapter 6 of the Global System Manager Manual).

\$57 SYSTEM IS QUIESCED - PLEASE DO NOT ATTEMPT TO SIGN ON

A supervisor has used the \$STATUS QUI command to quiesce Global System Manager. New users are not allowed to sign on to Global System Manager.

\$57 SWAP FILE NOT FOUND

You have attempted to sign off using \$E but have failed to load the volume containing the swap file, although requested to do so by a previous mount prompt. In this circumstance control returns to the monitor and you remain signed on to the system.

\$57 \$STARxx MUST NOT BE RUN

You have attempted to run from the menu or ready prompt one of the command program overlays used by the sign-on procedure. This is not allowed. The overlay returns control immediately to the ready prompt.

\$66 INSTALLATION ERROR 1

There is insufficient free memory for the installation program to install the startup initialisation data. The installation or transfer operation can only take place on a system with a larger user area.

\$66 INSTALLATION ERROR 2

The startup unit is invalid. See Note 1.

\$66 INSTALLATION ERROR 3
\$66 INSTALLATION ERROR 4

The part 1 startup data file (error 3) or the part 2 startup data file (error 4) cannot be found on the input volume. The missing file is neither present as a stand-alone file, nor is it a member of startup data library #.nnnn, where nnnn is the set number (the numeric part of the configuration file name). Note 1 applies.

\$66 INSTALLATION ERROR 5

The BH record on the part 1 startup data file is inconsistent with information held on the configuration file. See Note 1.

\$66 INSTALLATION ERROR 6

The INS instruction is unable to allocate a +BOOT file because the output volume already contains other data. It should be empty. See Note 1.

\$66 INSTALLATION ERROR 7

The volume type of the output volume is not the same as the volume type required for the startup data, as held in the configuration file. See Note 1.

\$66 INSTALLATION ERROR 8

The assignment tables are full and it is impossible for the INS instruction to assign \$P to the input unit in order to access the startup data library. See Note 1.

\$66 INSTALLATION ERROR 9

The output diskette is software interleaved, but the startup process cannot use interleaving. The volume should have been initialised (or formatted) with access option 1. See Note 1.

\$78 DESTROY xxxxxx?
\$78 DESTROY xxxxxx ON UNIT xxx?

The SYSIPL diskette you have mounted has previously been initialized by Global System Manager with the name shown. The second form of the message indicates that it is also formatted differently. If you intend overwriting an old diskette reply Y to continue, otherwise key N and then mount the correct diskette.

\$94 message

All messages prefixed by "\$94" are documented in Appendix A of the Global System Manager Manual.

\$99 ERROR c LOADING component

There has been a fatal error during the startup process which prevented the loading of the identified component. The startup process cannot continue, and it is impossible to initiate Global

System Manager. The quantity *c* is a single character error code defining the problem:

- 3 The required component is missing. Normally Note 1 applies.
- H There was a hardware error (associated with the drive electronics). Retry the startup process several times and if the error persists have the drive serviced.
- M The resident part of Global System Manager is too large to be loaded into the available memory. Normally Note 1 or Note 2 applies, but if you have updated the configuration file using Global Configurator this means you will have to reduce its size by allocating fewer or smaller buffers, or by removing support for some devices.
- P The configuration file version is incompatible with the nucleus version. Note 1 applies.
- R There was an I/O error (associated with the magnetic medium) when reading the component. See Note 3.
- V The Global System Manager directory of the volume containing the nucleus files and monitors has become corrupt. See Note 3.
- Z Sequence number fields in the records of the component itself are in error, indicating that it has become corrupt. See Note 3.

Appendix C – Pop-Up Error Messages

The messages described in this appendix are generated by either the Global Client process (i.e. GLOBAL.EXE) or the Global Server process (i.e. GLSERVER.EXE). For each error message a description of the possible error is given and where possible a solution.

Important note: All the messages described in this appendix appear in a Windows modal Dialogue Box (i.e. Message Box). The appearance of this Message Box will effectively stop all activity within the Global Client or Global Server until the message box is cleared by clicking on the OK button.

C.1 Error Messages Displayed by the Global Client (GLOBAL.EXE)

The errors reported by the Global Client can be divided into the following four types:

- fatal errors (e.g. an invalid network parameter has been specified);
- messages from the GUI (e.g. an invalid colour type has been specified);
- configuration errors (e.g. an invalid timing parameter has been specified);
- API errors (e.g. the ReadFile function has returned an error). Note that API errors are **disabled** by default. Normally, API errors will not interrupt the Global Server, but can be enabled in order to investigate a specific problem (see section G.3).

C.1.1 Fatal errors

The following errors are all considered to be fatal when the Global Client is loading and will prevent it from continuing. The fault **MUST** be rectified before the Global Client can load successfully. All the messages in this section will appear in a Message Box entitled "FATAL ERROR".

C.1.1.1 Insufficient parameters

The Global Client requires at least one parameter (i.e. the bootstrap device) to be specified (see section 6.3 for further details). This error will not occur if the Global Client is run from its installed icon or shortcut since the installation process ensures the correct command line parameter is present.

C.1.1.2 Invalid diskette drive device letter

The Global Client interprets a bootstrap device of the form X: to be a diskette drive and displays this error if neither A: nor B: is specified.

C.1.1.3 Unable to find bootstrap file: bootstrap_filename

The Global Client has attempted to open the specified bootstrap file but the attempt failed because the required file does not exist in the specified directory. **THIS ERROR WILL OCCUR IF THE GL-IPL.DLV FILE HAS NOT BEEN COPIED TO THE GLOBAL CLIENT DIRECTORY AFTER A GLOBAL CLIENT INSTALLATION.**

C.1.1.4 No bootstrap found on boot device

The Global Client has attempted to open the specified bootstrap file but the attempt failed because Global System Manager has not been installed on the file/directory specified. **THIS ERROR WILL OCCUR IF GLOBAL SYSTEM MANAGER HAS NOT BEEN INSTALLED ON THE LOCAL SYSRES AFTER A GLOBAL CLIENT (WITH LOCAL SYSRES) INSTALLATION.**

C.1.1.5 The BACRES diskette is not in the diskette drive

Please mount this diskette and restart the installation

The Global Client has attempted to open the diskette drive for the purpose of loading a bootstrap but the attempt failed because a diskette is not present in the drive. **THIS ERROR WILL OCCUR IF AN ATTEMPT IS MADE TO INSTALL GLOBAL SYSTEM MANAGER FROM DISKETTE BEFORE INSERTING THE BACRES DISKETTE IN THE A: DRIVE.**

C.1.1.6 The bootstrap file: bootstrap_filename is in use by another process

This Global Client has attempted to open the specified bootstrap file but the attempt failed because the required file is already in use by another process. **THIS ERROR WILL OCCUR IF THE GLOBAL CLIENT IS ALREADY RUNNING ON THE WORKSTATION.**

C.1.1.7 Registry information does not match load device parameter

When an Integrated Data File is used as the bootstrap device the Global Client checks to ensure that the command line parameter is equivalent to the appropriate IDFn value read from the Registry. This error will not occur if the Global Client is run from its installed icon or shortcut and the IDFn Registry value has not been modified since the installation.

C.1.1.8 No NodeID specified

The NodeID value in the Registry (see section 8.9.2) cannot be found. This value is required to set the Global Client's node-id when installing on a file server (i.e. using the GLINSSRV.BAT batch file). This error will only occur on systems where the Registry has been updated manually.

C.1.1.9 NodeID out of range for a fileserver

The NodeID value specified in the Registry (see section 8.9.2) is not in the valid range of 1 to 26. This value is required to allow the Global Client to assume the node-id of a file server when installing Global System Manager on the Master Server. This error will only occur on systems where the Registry has been updated manually.

C.1.1.10 NodeID out of range for a non-fileserver

The NodeID value specified in the Registry (see section 8.9.2) is not in the valid range 27 (0x1b) to 255 (0xff) (excluding 192 (0xc0)). This error will only occur on systems where the Registry has been updated manually.

C.1.1.11 No NodeID found in Registry

The NodeID value in the Registry (see section 8.9.2) cannot be found. This value is used to set the Global Client's node-id.

C.1.1.12 This application cannot run on Windows 3.1

Global System Manager (Windows NT) cannot only be used on versions of Windows that do not support the 32-bit Windows API. Please consult the Global Configuration Notes for full details of the versions of Windows supported by Global System Manager (Windows NT).

C.1.2 GUI errors

The following GUI errors are generated if an invalid value setting is detected in either of the following subkeys (see Appendix F):

\$GLMACH\Client\GUI\Colour

\$GLMACH\Client\GUI\Miscellaneous

All GUI errors are considered to be fatal when the Global Client is loading and prevent it from continuing. The fault MUST be rectified before the Global Client can load successfully. All the messages in this section will appear in a Message Box entitled "GLOBAL".

C.1.2.1 Invalid colour_setting colour

This error can occur for any of the 18 separate colour_setting values (e.g. SpeedbaseText). It indicates that the colour specified is not one of the 9 recognised by the Global Client (see section F.1.3 for a list of valid colours).

C.1.2.2 Invalid Speedbase colour type specification

This error can occur for any of the 18 Typenn combination settings and indicates that it has been specified incorrectly (e.g. an invalid colour number has been used). See section F.1.1 for further details on valid combination settings.

C.1.2.3 Invalid GSM colour combination mapping

This error can occur for any of the 32 Combinationnn mapping settings and indicates the mapping string is of an unrecognised format or an invalid colour number has been used. See section F.1.2 for further details on valid mapping strings.

C.1.2.4 RefreshTimeout too small, RefreshTimeout too large

The RefreshTimeout value in the Registry (see section F.2.1) is invalid. The value must be between 1 and 10 (seconds).

C.1.2.5 Invalid boolean_parameter setting

This error can occur for any of the boolean_parameter settings (e.g. SpeedbaseStatusBox) where the value read from the Registry is not recognised. See section 7.2.1 for further details on valid boolean settings.

C.1.2.6 MenuWidthReduction value too large

The MenuWidthReduction value in the Registry (see section F.2.14) is greater than its permitted maximum of 15.

C.1.2.7 Reserved

This section is deliberately left blank.

C.1.2.8 Invalid SYSREQKey format

The SYSREQKey value in the Registry is not of the expected format. See section F.2.18 for details on the correct encoding for this string.

C.1.2.9 SYSREQKey parameter out of range

The SYSREQKey value in the Registry (see section F.2.18) is out of range (i.e. it is not in the range 1 to 12).

C.1.2.10 Error parsing NarrowModeFont string

The font selection value in the Registry (see section F.2.15) uses a specific format to encode the width and height of the font required. The value in the Registry is not recognised.

C.1.2.11 Error parsing WideModeFont string

The font selection value in the Registry (see section F.2.19) uses a specific format to encode the width and height of the font required. The value in the Registry is not recognised.

C.1.2.12 Insufficient MainFramePosition parameters

The MainFramePosition value in the Registry (see section F.2.13) requires 4 parameters to be specified to locate the Global window on the screen. This value in the Registry does not have sufficient parameters.

C.1.3 Configuration errors

The following errors are considered to be non-fatal, configuration errors. A recovery action can be performed without stopping the Global Client. However, it is advisable to rectify the fault before re-loading the Global Client. All the messages in this section will appear in a Message Box entitled "CONFIGURATION ERROR".

C.1.3.1 StatusLinePoll out of range Resetting to 10 seconds

The StatusLinePoll value in the Registry (see section 8.9.3) is not in the valid range 0 to 3600 (seconds). This warning indicates that the value will be set to its default of 10 seconds.

C.1.3.2 InactivityTimeout out of range Disabling timeout

The InactivityTimeout value in the Registry (see sections 8.2.1.2 and 8.2.2.2) is not in the valid range 0 to 600 (minutes). This warning indicates that the value will be set to its default of 0 minutes (i.e. the Inactivity timeout will be disabled).

C.1.3.3 ProtocolSequence not found

The Global Client requires three parameters to locate each Global Server on the network. On the first access to a Server the parameters are read from the Registry (see section 8.6.1.2.2). If the Protocol Sequence is not established then this configuration error will be reported. Note that it is possible to use the Global Registry Editor utility (GLREGED.EXE) to add the missing entries whilst the Global Client is still running. The updated entry will be used on the next access to the required Global Server.

C.1.3.4 NetworkAddress not found

The Global Client requires three parameters to locate each Global Server on the network. On the first access to a Server the parameters are read from the Registry (see section 8.6.1.2.2). If the Network Address is not established then this configuration error will be reported. Note that it is possible to use the Global Registry Editor utility (GLREGED.EXE) to add the missing entries whilst the Global Client is still running. The updated entry will be used on the next access to the required Global Server.

C.1.3.5 Endpoint not found

The Global Client requires three parameters to locate each Global Server on the network. On the first access to a Server the parameters are read from the Registry (see section 8.6.1.2.2). If the Endpoint is not established then this configuration error will be reported. Note that it is possible to use the Global Registry Editor utility (GLREGED.EXE) to add the missing entries whilst the Global Client is still running. The updated entry will be used on the next access to the required Global Server.

C.1.3.6 Differing GSM master nodes

The Global System Manager network architecture requires a file server to be designated the Master Server. This Master Server is identified during installation and must be configured identically for all Global Clients and Global Servers configured on the same network. This error message indicates that the Global Server just accessed does not exist on the same Global System Manager network as the Global Client attempting the access.

C.1.3.7 Incompatible Global server

The Global Clients communicate with Global Servers using the Remote Procedure Call (RPC) interface. This interface includes a version number which allows a Client-Server incompatibility to be detected. If the version of a Server is incompatible with the version of the Client this Message Box will appear.

Important note: The RPC interface version number will NOT change for every variant of the BACNAT software so it is possible, although not advisable, to run Global Clients and Global Servers with different BACNAT variants. Note also that up to the time of writing, the RPC interface version number has only changed once (between BACNAT variants 1.3 and 1.4).

C.1.3.8 Node-id mismatch for server X

The Global Client locates each Global Server via the ProtocolSequence, NetworkAddress and Endpoint values in the Registry (see section 8.6.1.2.2). These values are specified when installing the Client software (see section 2.2.4.9). If the location information for two Servers is accidentally swapped (e.g. if Servers X and Y are configured on the same machine with endpoints 3000 and 3001 respectively but during a Client installation they are inadvertently set up as 3001 and 3000) the Client will attempt to access the wrong Server. This error message indicates that the Global Client has successfully accessed a Global Server but the Server is not the one it intended to access.

C.1.3.9 The protocol sequence ProtSeq is not supported on this system

The ProtocolSequence value in the Registry (ProtSeq) is a valid protocol sequence but is not supported on this computer.

C.1.3.10 The protocol sequence ProtSeq is invalid

The ProtocolSequence value in the Registry (ProtSeq) is not a recognised protocol sequence.

C.1.4 API errors

The Global Client makes various system calls to Windows NT or Windows 95 (e.g. to access files, to send data to a printer, etc.). Most of these system calls are expected to complete successfully (e.g. a read from an existing discrete data file) or to return a recognised error which can be handled entirely by Global System Manager (e.g. a NOT READY error on a diskette). Other errors will be reported as non-specific errors by Global System Manager (e.g. a hardware error) but the **actual** error reported by Windows will be ignored.

The API Error Message Box contains the actual error returned from the Windows API call, and other potentially useful information, in the following format:

```
file_name
Error n from API_call on line nnn.
descriptive_error_message
```

where `file_name` is the development source file name, `n` is the error number reported, `API_call` is the system call name and `nnn` is the line number within the source file. The `descriptive_error_message` is the text version of the error number, `n`.

For example, the following API error will be displayed if an integrated file does not exist:

```
C:\LANG\MSDEV.41\PROJECTS\GLOBAL4\VC5AB.C
Error 2 from CreateFile on line 56.
The system cannot find the file specified.
```

Important note: The API errors are not displayed by default on a standard configuration. API error reporting is enabled by configuring the `DiagnosticDisplays` value in the Registry (see sections 8.9.3 and G.3). This option should only be enabled when investigating a problem and should be **disabled** during normal operation.

C.2 Error Messages Displayed by the Global Server (GLSERVER.EXE)

The errors reported by the Global Server can be divided into the following three types:

- fatal errors (e.g. an invalid network parameter has been specified);
- configuration error (e.g. an invalid timing parameter has been specified);
- API errors (e.g. the `ReadFile` function has returned an error). Note that API errors are **disabled** by default. Normally, API errors will not interrupt the Global Server, but can be enabled in order to investigate a specific problem (see section G.3).

C.2.1 Fatal errors

The following errors are all considered to be fatal when the Global Server is loading and will prevent it from continuing. The fault **MUST** be rectified before the Global Server can load successfully. All the messages in this section will appear in a Message Box entitled "FATAL ERROR".

C.2.1.1 Insufficient parameters

The Global Server requires at least one parameter (i.e. the Server's node-id) to be specified (see section 6.4 for further details). This error will not occur if the Global Servers are started by the `GLSSTART` utility.

C.2.1.2 Invalid parameter length

The parameter for a Global Server **MUST** be a single character. This error will appear if the parameter is longer than 1 character. This error will not occur if the Global Servers are started by the `GLSSTART` utility.

C.2.1.3 Parameter out of range

The parameter for a Global Server MUST specify a Global System Manager File Server node-id (i.e. between "A" to "Z"). This error will not occur if the Global Servers are started by the GLSSTART utility.

C.2.1.4 No BootDevice found in Registry

The Global Server uses the BootDevice value in the Registry (see section 9.9.2) to determine where its bootstrap information is kept. If this value is not present then the server will be unable to load. This error will not occur on installed systems unless the Registry has been updated manually.

C.2.1.5 Invalid diskette drive device letter

The Global Server interprets a bootstrap device of the form X: to be a diskette drive and displays this error if neither A: nor B: is specified.

C.2.1.6 Unable to find bootstrap file: bootstrap_filename

The Global Server has attempted to open the specified bootstrap file but the attempt failed because the required file does not exist in the specified directory.

C.2.1.7 The bootstrap file: bootstrap_filename is in use by another process

This Global Client has attempted to open the specified bootstrap file but the attempt failed because the required file is already in use by another process. This error will occur if a Global Server with the same Node-id is already running on the computer.

C.2.1.8 MasterNodeID not found

The MasterNodeID value in the Registry (see section 9.9.1) is required to ensure that all Global Clients and Global Servers exist on the same Global System Manager network (i.e. a network with the same Master Node-id). This error will not occur on installed systems unless the Registry has been updated manually.

C.2.1.9 Invalid MasterNodeID string length

The MasterNodeID value in the Registry (see section 9.9.1) MUST be a single characters. This error will appear if the parameter is longer than 1 character. This error will not occur on installed systems unless the Registry has been updated manually.

C.2.1.10 MasterNodeID out of range

The MasterNodeID parameter in the Registry (see section 9.9.1) MUST specify a Global System Manager File Server node-id (i.e. between "A" to "Z"). This error will not occur on installed systems unless the Registry has been updated manually.

C.2.1.11 ProtocolSequence not found, Endpoint not found

The Global Server requires two parameters to start up as a server on a Client-Server RPC link. If these Registry values cannot be found then the Global Server cannot start successfully.

C.2.1.12 RPC protocol sequences not supported

The Global Server checks that the requested protocol sequence is supported on computer on which it is running. This error is reported if the computer has NO network protocols configured.

C.2.1.13 The protocol sequence ProtSeq is not supported...

The Global Server checks that the requested protocol sequence (ProtSeq) is supported. This error is displayed if the requested

protocol is not supported. For convenience, details of all the protocols that are supported are displayed.

C.2.2 Configuration errors

The following errors are considered to be non-fatal configuration errors. A recovery action can be performed without stopping the Global Server. However, it is advisable to rectify the fault before re-loading the Global Server. All the messages in this section will appear in a Message Box entitled "CONFIGURATION ERROR".

C.2.2.1 MaxCalls out of range Resetting to 99

The MaxCalls value in the Registry (see section 9.9.2) is not in the valid range 5 to 230. This warning indicates that the value will be set to its default value of 99.

C.2.2.2 InactivityTimeout out of range Disabling timeout

The InactivityTimeout value in the Registry (see sections 9.2.1.2 and 9.2.2.2) is not in the valid range 0 to 600 (minutes). This warning indicates that the value will be set to its default of 0 minutes (i.e. the Inactivity timeout will be disabled).

C.2.3 API errors

The Global Server makes various system calls to Windows NT or Windows 95 (e.g. to access files). Most of these system calls are expected to complete successfully (e.g. a read from an existing discrete data file) or to return a recognised error which can be handled entirely by Global System Manager (e.g. a NOT READY error on a diskette). Other errors will be reported as non-specific errors by Global System Manager (e.g. a hardware error) but the **actual** error reported by Windows will be ignored.

The API Error Message Box contains the actual error returned from the Windows API call, and other potentially useful information, in the following format:

```
file_name
Error n from API_call on line nnn.
descriptive_error_message
```

where file_name is the development source file name, n is the error number reported, API_call is the system call name and nnn is the line number within the source file. The descriptive_error_message is the text version of the error number, n.

For example the following API error will be displayed if an integrated file does not exist:

```
C:\LANG\MSDEV.41\PROJECTS\GLOBAL4\VC5AB.C
Error 2 from CreateFile on line 56.
The system cannot find the file specified.
```

Important note: The API errors are not displayed by default on a standard configuration. API error reporting is enabled by configuring the DiagnosticDisplays value in the Registry (see sections 9.9.2 and G.3). This option should only be enabled when investigating a problem and should be disabled during normal operation.

Appendix D – Windows Files and Directories

This appendix describes the various Windows files and directories that are distributed on the BACNAT media and installed onto the hard-disk by the Global Client and Global Server installations.

Important note: The information in this appendix is accurate at the time of writing although it is subject to change as more functionality is added to Global System Manager (Windows NT).

D.1 Windows Files Distributed on the BACNAT Media

This section describes the various files distributed on the BACNAT media.

D.1.1 Windows Files on BACNAT Diskette-1

The following Windows files are present on the first BACNAT diskette:

INST32I.EX	Component required by SETUP.EXE;
_ISDEL.EXE	Component required by SETUP.EXE;
_SETUP.DLL	Component required by SETUP.EXE;
_SETUP.LIB	Component required by SETUP.EXE;
SETUP.EXE	Setup/installation utility;
DISK1.ID	BACNAT part-1 identifier file;
SETUP.INS	Setup/installation rules file;
GLCOMP.1	Compressed Global files part-1;
SETUP.PKG	Component required by SETUP.EXE;
UNINST.EXE	Uninstall utility.

D.1.2 Windows Files on BACNAT Diskette-2

The following Windows files are present on the second BACNAT diskette:

DISK2.ID	BACNAT part-2 identifier file;
GLCOMP.2	Compressed Global files part-2.

D.2 Windows Files Installed by SETUP.EXE

This section describes the various files installed on the hard-disk when the Setup utility is used to install a Global Client and/or Global Server.

D.2.1 Windows Files Installed during a Global Client Installation

The following Windows files and directories are installed during a Global Client installation:

DeIsL1.isu	Component required by the Uninstall utility;
------------	--

THIS FILE;	GLMACH.TLT	Registry template file. DO NOT ATTEMPT TO EDIT
EDIT THIS FILE;	GLUSER.TLT	Registry template file. DO NOT ATTEMPT TO
	GLDFMAIN.EXE	Data File maintenance utility (see section 6.6);
	GLREGED.EXE	Global Registry Editor (see Chapter 7);
	GLOBAL.EXE	Global Client executable (see section 6.3);
	GLSSTART.EXE	Start Global Servers (not strictly required);
	GRAPHS\	Directory for template files for the Graph Viewer (see section 5.3.8).

The following files are installed in the GRAPHS directory:

	GSMCONV.TLT	Default graph template file;
	GSMCONV.EXE	Screen dump to graph file conversion utility;
	GSMCRTLT.EXE	Template file creation utility;
	GSMGRAPH.EXE	Graph Viewer utility;

The following files are optional and depend on the type of Client installation:

	GSM200\	Local DDF directory (only present if either the "Local SYSRES" or "Local DDF" options were selected during the Client installation);
	GLInsCli.BAT	Global Client installation batch file (only present if the "Local SYSRES" option was selected during the Client installation).

Important note: The Global Client SYSIPL.DLV (default name GL-IPL.DLV), which is produced during the Global Server (sic) installation, is NOT created during the Global Client installation. This file **MUST** be copied to the Global Client directory from the Global "Master Server" directory after Global System Manager has been installed on the "Master Server".

D.2.2 Windows Files Installed during a Global Server Installation

The following Windows files and directories are installed during a Global Server installation:

	DeIsL1.isu	Component required by the Uninstall utility;
THIS FILE;	GLMACH.TLT	Registry template file. DO NOT ATTEMPT TO EDIT
EDIT THIS FILE;	GLUSER.TLT	Registry template file. DO NOT ATTEMPT TO
	GLDFMAIN.EXE	Data File maintenance utility (see section 6.6);

GLREGED.EXE	Global Registry Editor (see Chapter 7);
GLSERVER.EXE	Global Server executable (see section 6.4);
GLSSTART.EXE	Start Global Servers (see section 6.5);
GSMx00\	Server DDF directory (only present if either the "Local SYSRES" or "Local DDF" options were selected during the Client installation);
GL-x-IPL.DLV	Pre-initialised Global Server SYSIPL DLV.

The following files are optional and are only installed for a "Master Server" installation:

GL-IPL.DLV	Empty Global Client SYSIPL DLV. This file is updated during the "Master Server" (sic) installation. It should only be copied to the Global Client directories AFTER the Global System Manager installation on the Master Server installation has been completed;
GLInsSrv.BAT	Global Server installation batch file;
GLOBAL.EXE	Global Client executable (see section 6.3). This program is only required to allow Global System Manager to be installed on the Master Server.

D.2.3 Windows Files Installed during a Dual Installation

If both a Global Server and a Global Client are installed into the same directory on the same computer, the resultant Global directory will contain all the components listed in both sections D.2.1 and D.2.2.

Appendix E - Global Registry Definition

This appendix describes the Global sections of the Windows Registry.

Important note: The information in this appendix is accurate at the time of writing although it is subject to change as more functionality is added to Global System Manager (Windows NT).

E.1 Global Registry entries below the HKEY_CURRENT_USER Hive

This section describes the structure of the Global entries within the "Current User" Registry Hive. All "Current User" Global entries are under the HKEY_CURRENT_USER\Software\Global key. In this appendix, and within other sections of this manual, this parent key is abbreviated to "\$GLUSER".

The template for this Registry structure is defined in the GLUSER.TLT file. **DO NOT, UNDER ANY CIRCUMSTANCES, ATTEMPT TO MODIFY THE GLUSER.TLT FILE.**

The numbers in the left margin refer to an arbitrary level and have no meaning in the context of the Windows Registry.

	Registry key name	Value name
	HKEY_CURRENT_USER	
0)	Software	
1)	Global	
		Version
2)	Client	
		OperatorID
		TerminalType

E.2 Global Registry entries below the HKEY_LOCAL_MACHINE Hive

This section describes the structure of the Global entries within the "Local Machine" Registry Hive. All "Local Machine" Global entries are under the HKEY_LOCAL_MACHINE\Software\Global key. In this appendix, and within other sections of this manual, this parent key is abbreviated to "\$GLMACH".

The template for this Registry structure is defined in the GLMACH.TLT file. **DO NOT, UNDER ANY CIRCUMSTANCES, ATTEMPT TO MODIFY THE GLMACH.TLT FILE.**

The numbers in the left margin refer to an arbitrary level and have no meaning in the context of the Windows Registry.

	Registry key name	Value name
	HKEY_LOCAL_MACHINE	
0)	Software	
1)	Global	
		Version
2)	Client	
		DiagnosticDisplays
		InstallDirectory
		NodeID

Appendix E - Global Registry Definition

		StatusLinePoll
		MaximumMemory
		DisableHibernation
3)	Data	
		Diskette
4)	DiscreteDataFiles	
		DDF0
		DDF1
		DDF2
		DDF3
		DDF4
		DDF5
		DDF6
		DDF7
		DDF8
		DDF9
		HANDLES
		InactivityTimeout
4)	IntegratedDataFiles	
		IDF0
		IDF1
		IDF2
		IDF3
		IDF4
		IDF5
		IDF6
		IDF7
		IDF8
		IDF9
		InactivityTimeout
3)	Install	
		DDF0
		DDF1
		DDF2
		DDF3
		DDF4
		DDF5
		DDF6
		DDF7
		DDF8
		DDF9
		IDF0
		NodeID
3)	Printers	
4)	DOSPrint	
5)	5nn [500 - 599]	

(up to 100 subkeys, from "500" to "599", may be defined under the "\$GLMACH\Client\Printers\DOSPrint" parent-key)

		Name
		CreateNewFile
		LFToLFCR
4)	WinPrint	
5)	5nn [500 - 599]	

(up to 100 subkeys, from "500" to "599", may be defined under the "\$GLMACH\Client\Printers\WinPrint" parent-key)

Name

3) 4)	Screens GUI	DisableValidation Timeout
5)	Colour	DisplayBufferSize KeyboardBufferSize ReceivePollDivisor TransmitPollDivisor EnableStartAccept Combination01 Combination02 Combination03 Combination04 Combination05 Combination06 Combination07 Combination08 Combination09 Combination10 Combination11 Combination12 Combination13 Combination14 Combination15 Combination16 Combination17 Combination18 Combination19 Combination20 Combination21 Combination22 Combination23 Combination24 Combination25 Combination26 Combination27 Combination28 Combination29 Combination30 Combination31 Combination32 GSMBackground MenuHandlerBackground MenuHandlerHighlightBackground MenuHandlerHighlightText MenuHandlerProtectedText MenuHandlerText PopMenuProtectedText SpeedbaseA14Background SpeedbaseA14Text SpeedbaseAcceptBackground SpeedbaseAcceptText SpeedbaseBackground SpeedbaseHighlightBackground SpeedbaseHighlightText SpeedbaseNonScrolledDataBackgr ound SpeedbaseNonScrolledDataText

		SpeedbaseScrolledAcceptBackground
		SpeedbaseScrolledAcceptText
		SpeedbaseScrolledBackground
		SpeedbaseScrolledLineSeparator
		SpeedbaseScrolledText
		SpeedbaseText
		SubstituteMenuColours
		SystemRequestBackground
		Type01
		Type02
		Type03
		Type04
		Type05
		Type06
		Type07
		Type08
		Type09
		Type10
		Type11
		Type12
		Type13
		Type14
		Type15
		Type16
		Type17
		Type18
5)	Miscellaneous	DefaultFileName
		DisableButtons
		DisableProportionalFont
		ExtendedCommandBox
		FixedFont
		HelpKeySwap
		IgnoreDisplayOnlySequence
		IgnoreEscape
		IgnoreGUISequences
		LockFocus
		LogDisplays
		LogKeystrokes
		MainFrameCaption
		MainFramePosition
		MenuItemNumbering
		MenuWidthReduction
		MiddleMouseButton
		NarrowModeFont
		RefreshTimeout
		RightMouseButton
		ScrollBarRange
		ScrolledAreaSequence
		SingleClickMenuSelection
		SpeedbaseErrorBox
		StatusBar
		SYSREQKey
		Toolbar
		VariableFont
		VGACompatibility
		WideModeFont
4)	Serial	ReceivePollDivisor

Appendix E - Global Registry Definition

		MaxCalls
		ProtocolSequence
4)	Data	
		Diskette
5)	DiscreteDataFiles	
		DDF0
		DDF1
		DDF2
		DDF3
		DDF4
		DDF5
		DDF6
		DDF7
		DDF8
		DDF9
		HANDLES
		InactivityTimeout
5)	IntegratedDataFiles	
		IDF0
		IDF1
		IDF2
		IDF3
		IDF4
		IDF5
		IDF6
		IDF7
		IDF8
		IDF9
		InactivityTimeout
2)	Speedbase	
		DiagnosticDisplays
		Endpoint
		MaxCalls
		ProtocolSequence

Appendix F - GUI Registry Options

As illustrated in Appendix E a large number of Registry ValueNames parameterise the operation of the Global System Manager (Windows NT) Graphical User Interface (GUI) sub-system.

F.1 Registry Values under the \$GLMACH\Client\GUI\Colour Key

This section of the Registry defines the 18 Speedbase colours that are used when running Speedbase applications, up to 32 Global System Manager colour combination mappings and the various colours used for Speedbase frames and Menus.

Users of the Global Windows Workstation, who are familiar with the format of the GSMWIN.INI file, will recognise that this section of the Registry corresponds to the [colour] section of the GSMWIN.INI file.

F.1.1 Type1 - Type18

The Speedbase TAP for the GUI sub-system, T>711, uses special colour combinations for the 18 Speedbase colour types. Most of these combinations are unreadable so these customisations allow them to be translated back to give an acceptable display. The colour combinations are specified in the same way as the Speedbase customisation program (i.e. via a string which specifies the ink colour, paper colour and attributes).

If a Typenn combination is not specified it defaults to the standard T>519 value:

```
Type1=81B
Type2=81
Type3=41B
Type4=41B
Type5=18B
Type6=24
Type7=58
Type8=35B
Type9=51B
Type10=81B
Type11=51B
Type12=85B
Type13=81
Type14=81
Type15=81B
Type16=85B
Type17=41B
Type18=41B
```

F.1.2 Combination1 - Combination32

Most Global Cobol applications make use of the 8 colour combinations for their displays (e.g. combination 2 is used for boxes). The default colour combinations are set up using a non-Windows colour style. These mapping options allow the GUI sub-system to present a Windows style screen whilst preserving the standard colour combinations for other user's on the Global system. The mappings are set up using a similar notation as \$CUS as follows:

```
Combinationn=CP/CI-MP/MI
```

where: n in the range 1 to 32
CP Combination paper colour
CI Combination ink colour
MP Mapped paper colour
MI Mapped ink colour

Each "Combination Colour" must be a digit in the range 1 to 8 that refers to one of the 8 Global System Manager colours (as defined in the Colour Customisation option of \$CUS):

1 = Black
2 = Blue
3 = Green
4 = Cyan
5 = Red
6 = Magenta
7 = Yellow
8 = White

Each "Mapped Colour" must be a digit in the range 1 to 9 that refers to one of the following colours:

1 = Black
2 = Blue
3 = Green
4 = Cyan
5 = Red
6 = Magenta
7 = Yellow
8 = White
9 = Grey

Note that the first 8 "Mapped Colours" are identical to the 8 "\$CUS Colours".

If no Combinationn settings are specified then no colour mapping is performed.

F.1.3 SpeedbaseBackground

This setting specifies the paper colour which will be used to display Speedbase windows and Global-3000 pop-menus. Valid string values for the colour are:

Black
Blue
Red
Magenta
Green
Cyan
Yellow
White
Grey

If a colour is not specified the Windows Background Colour, as specified in the Windows Control Panel, will be used.

F.1.4 SpeedbaseText

This setting specifies the ink colour which will be used to display Speedbase windows and Global-3000 pop-menus. The valid colours are defined in section F.1.3.

If a colour is not specified the Windows Text Colour, as specified in the Windows Control Panel, will be used.

F.1.5 SpeedbaseScrolledBackground

This setting specifies the paper colour which will be used to display a scrolled area in a Speedbase window. The valid colours are defined in section F.1.3.

If a colour is not specified a default of White will be used.

F.1.6 SpeedbaseScrolledText

This setting specifies the ink colour which will be used to display a scrolled area in a Speedbase window. The valid colours are defined in section F.1.3.

If a colour is not specified a default of Black will be used.

F.1.7 SpeedbaseHighlightBackground

This setting specifies the paper colour which will be used to display a current record in a Speedbase window or Global-3000 pop-menu. The valid colours are defined in section F.1.3.

If a colour is not specified a default of Blue will be used.

F.1.8 SpeedbaseHighlightText

This setting specifies the ink colour which will be used to display a current record in a Speedbase window or Global-3000 pop-menu. The valid colours are defined in section F.1.3.

If a colour is not specified a default of White will be used.

F.1.9 PopMenuProtectedText

This setting specifies the ink colour which will be used to display a protected line in a Global 3000 pop menu window. The valid colours are defined in F.1.3.

If a colour is not specified a default of White will be used.

F.1.10 MenuHandlerBackground

This setting specifies the paper colour which will be used to display a menu handler window. The valid colours are defined in F.1.3.

If a colour is not specified the Windows Background Colour, as specified in the Windows Control Panel, will be used.

F.1.11 MenuHandlerText

This setting specifies the ink colour which will be used to display a menu handler window. The valid colours are defined in F.1.3.

If a colour is not specified the Windows Text Colour, as specified in the Windows Control Panel, will be used.

F.1.12 MenuHandlerHighlightBackground

This setting specifies the paper colour which will be used to display a selected menu line in a menu handler window. The valid colours are defined in F.1.3.

If a colour is not specified a default of Blue will be used.

F.1.13 MenuHandlerHighlightText

This setting specifies the ink colour which will be used to display a selected menu line in a menu handler window. The valid colours are defined in F.1.3.

If a colour is not specified a default of White will be used.

F.1.14 MenuHandlerProtectedText

This setting specifies the ink colour which will be used to display a protected line in a menu handler window. The valid colours are defined in F.1.3.

If a colour not specified a default of Grey will be used.

F.1.15 GSMBackground

This setting specifies the initial paper colour of a Global System Manager window. Note that it does not affect the Global System Manager colour combinations but is used to stop the window from flickering. For example, the standard Global System Manager colour combinations predominantly use a black background and if the window first appears with a white background then it will appear to flicker. The valid colours are defined in F.1.3.

If a colour is not specified a default of Black will be used.

F.1.16 SystemRequestBackground

This setting specifies the initial paper colour of a system request window. Note that it does not affect the Global System Manager colour combinations but is used to stop the window from flickering. For example, the standard Global System Manager colour combination used for system requests uses a cyan background and if the window first appears with a white background then it will appear to flicker. The valid colours are defined in F.1.3.

If a colour is not specified a default of Cyan will be used.

F.1.17 SpeedbaseAcceptBackground

This setting specifies the paper colour which will be used to display the current accept field in a non-scrolled area of a Speedbase window. The valid colours are defined in section F.1.3.

If a colour is not specified the Windows Background Colour, as specified in the Windows Control Panel, will be used.

F.1.18 SpeedbaseAcceptText

This setting specifies the ink colour which will be used to display the current accept field in a non-scrolled area of a Speedbase window. The valid colours are defined in section F.1.3.

If a colour is not specified the Windows Text Colour, as specified in the Windows Control Panel, will be used.

F.1.19 SpeedbaseScrolledAcceptBackground

This setting specifies the paper colour which will be used to display the current accept field in a scrolled area of a Speedbase window. The valid colours are defined in section F.1.3.

If a colour is not specified a default of White will be used.

F.1.20 SpeedbaseScrolledAcceptText

This setting specifies the ink colour which will be used to display the current accept field in a scrolled area of a Speedbase window. The valid colours are defined in section F.1.3.

If a colour is not specified a default of Black will be used.

F.2 Registry Values under \$GLMACH\Client\GUI\Miscellaneous

This section of the Registry defines a number of general-purpose customisable properties of the GUI.

Users of the Global Windows Workstation, who are familiar with the format of the GSMWIN.INI file, will recognise that this section of the Registry corresponds to the [miscellaneous] section of the GSMWIN.INI file.

F.2.1 RefreshTimeout

The GUI sub-system refreshes the screen when an accept is in progress. However, some operations do not require an accept (e.g. verifying a diskette) so this timeout is used to refresh the screen whilst an accept is not in progress. This setting allows the timeout (in seconds) to be customised (minimum 1, maximum 10).

If the RefreshTimeout setting is not specified then it defaults to a value of 5 seconds. Note that a refresh timeout of 1 second is NOT recommended because a value that is too low can result in the fleeting appearance of menu screens displayed in normal text mode.

F.2.2 RightMouseButton

This setting allows the right mouse button to be used to generate a string of characters. Any string value can be specified, but <CR>, <ESCAPE> and <HELP> are treated specially. Also, any strings beginning with a # are treated as hexadecimal numbers. Note that a <CR> is automatically appended to a standard string.

If a RightMouseButton string is not specified this facility is disabled.

F.2.3 MiddleMouseButton

This setting allows the middle mouse button to be used to generate a string of characters. Any string value can be specified, but <CR> and <ESCAPE> are treated specially. Also, any strings beginning with a # are treated as hexadecimal numbers. Note that a <CR> is automatically appended to a standard string.

If a MiddleMouseButton string is not specified this facility is disabled.

F.2.4 ExtendedCommandBox

This setting specifies the initial setting of the extended command box option. Any of the enable/disable strings defined in section 7.2.1 are valid.

If a `ExtendedCommandBox` string is not specified this setting defaults to No.

F.2.5 Toolbar

This setting specifies the initial setting of the toolbar display option. Any of the enable/disable strings defined in section 7.2.1 are valid.

If a `ToolBar` string is not specified this setting defaults to Yes.

F.2.6 StatusBar

This setting specifies the initial setting of the status bar display option. Any of the enable/disable strings defined in section 7.2.1 are valid.

If a `StatusBar` string is not specified this setting defaults to Yes.

F.2.7 LogDisplays

This setting specifies whether characters sent to the GUI sub-system (i.e. characters to be displayed) should be written to a log file, `DISPLOG.BIN`. This file is opened when the first character arrives and closed when the Global Client is terminated (i.e. it records every character displayed and hence can become very large). Note that an existing `DISPLOG.BIN` file will be automatically overwritten every time the Global Client is started. Any of the enable/disable strings defined in section 7.2.1 are valid.

If a `LogDisplays` string is not specified this setting defaults to No.

F.2.8 SpeedbaseErrorBox

This setting specifies whether a Speedbase error should be displayed in a Windows message box or on the status bar. Any of the enable/disable strings defined in section 7.2.1 are valid.

If a `SpeedbaseErrorBox` string is not specified this setting defaults to No.

Note that if this option is enabled the Windows message box must be cleared before continuing with the application (i.e. it will not be possible to swap partitions in Global System Manager in order to clear the condition). If a Speedbase application is run via the GUI sub-system and is likely to produce an error which requires corrective action in another partition then this option should be disabled.

F.2.9 HelpKeySwap

This setting specifies whether the key values sent to the host on clicking the Speedbase help, normally F8, and UF1, normally F1, toolbar entries should be swapped. Note that this change requires the Speedbase `TAP, T>711`, to be modified to accept these function key values. Any of the enable/disable strings defined in section 7.2.1 are valid.

The default is Off

F.2.10 IgnoreEscape

This setting forces the emulator to ignore all escape characters sent from the host system. **THIS OPTION IS RESERVED FOR INTERNAL USE AND IS DOCUMENTED FOR COMPLETENESS ONLY.** Any of the enable/disable strings defined in section 7.2.1 are valid.

The default is Off.

F.2.11 IgnoreGUISequences

This setting forces the emulator to ignore all GUI specific sequences sent from the host system. **THIS OPTION IS RESERVED FOR INTERNAL USE AND IS DOCUMENTED FOR COMPLETENESS ONLY.** Any of the enable/disable strings defined in section 7.2.1 are valid.

The default is Off.

F.2.12 MainFrameCaption

This setting specifies the string to be used as the main frame caption when a non-Speedbase program is running.

The default is Global Windows Workstation.

F.2.13 MainFramePosition

This setting specifies the initial position of the main frame window. The position is expressed as the co-ordinates of the top left hand corner and the size of the frame as a string of the form L,T,W,H where L is the top left corner x co-ordinate, T is the top left corner y co-ordinate, W is the frame width and H is the frame height. Note that all co-ordinate and size values are in pixels. If the width and/or height parameters are set to 0 then the frame will be expanded to fill the screen horizontally and/or vertically.

The default is 0,0,0,0.

F.2.14 MenuWidthReduction

By default each menu handler window is sized to match the menu handler frame width but this is almost always too large when displayed using the GUI sub-system because a proportional font is used to display the menu lines. This setting allows the menu handler window's width to be reduced by a fixed amount and must be in the range 0 to 15. Note that this width reduction applies to all menu windows.

The default is 0.

F.2.15 NarrowModeFont

This setting specifies the narrow mode font size for the Global System Manager window (i.e. the 80 x 24 text image). This is specified as a string of the form WxH, where W is the character width (in pixels) and H is the character height (in pixels). Note that the window used to display the image is sized to show an entire line of 80 characters and if the screen resolution is not sufficiently high then the extra characters will be clipped. Note also that if the specified font size does not exist then Windows will select the nearest match.

The default is 8x12.

F.2.16 ScrollBarRange

This setting specifies the range of values generated when moving the thumb on the scroll bar which are converted to a related number of page-up or page-down characters and sent to the application. For example, if the range is set to 10 the thumb will be positioned at the middle of the scroll bar at position 5 and from this position up to 5 page-up or page-down characters can be generated depending on how far the thumb is moved.

The default is 2.

F.2.17 SingleClickMenuSelection

This setting specifies whether a single or double click is necessary to select an entry from a menu handler window. In single click mode the highlighted line moves with the mouse cursor and a single click selects the highlighted entry. In double click mode a single click highlights the line pointed at by the mouse cursor and a double click selects that line. Any of the enable/disable strings defined in section 7.2.1 are valid.

The default is On.

F.2.18 SYSREQKey

This setting allows the function key used as the SYSREQ key by the menu and toolbar entries which require the SYSREQ key. This setting is specified as a string of the form Fn where n is the function key number, e.g. F12. Valid strings are those in the range F1 to F12.

The default is F10.

F.2.19 WideModeFont

This setting specifies the wide mode font size for the GSM window, i.e. the 132 x 24 text image. This is specified as a string of the form WxH, where W is the character width (in pixels) and H is the character height (in pixels). Note that the window used to display the image is sized to show an entire line of 132 characters and if the screen resolution is not sufficiently high then the extra characters will be clipped. Note also that if the specified font size does not exist then Windows will select the nearest match.

The default is 5x12.

F.2.20 IgnoreDisplayOnlySequence

This setting specifies whether the Display Only escape sequence (generated by Speedbase Presentation Manager V8.1 revision 8.1g, and later) should be ignored. Any of the enable/disable string defined in section 7.2.1 are valid.

If a IgnoreDisplayOnlySequence value is not specified this setting default to No.

Important note: You are strongly advised to enable this option.

F.2.21 LockFocus

This setting specifies whether the focus should be locked on the currently used window (i.e. it ensures that a user cannot put the focus on an incorrect window). Any of the enable/disable strings defined in section 7.2.1 are valid.

If a LockFocus value is not specified this setting default to No.

Important note: You are strongly advised to enable this option.

F.2.22 ScrolledAreaSequence

This setting specifies whether the Scrolled Area Identification escape sequence (generated by Speedbase Presentation Manager V8.1 revision 8.1g, and later) should be ignored. Any of the enable/disable string defined in section 7.2.1 are valid.

If a ScrolledAreaSequence value is not specified this setting defaults to No.

Important note: You are strongly advised to enable this option.

F.2.23 LogKeystrokes

This setting specifies whether characters sent from the GUI sub-system (i.e. characters keyed) should be written to a log file, KEYLOG.BIN. Note that an existing KEYLOG.BIN file will be automatically overwritten every time the Global Client is started. Any of the enable/disable strings defined in section 7.2.1 are valid.

If a LogKeystrokes string is not specified this setting defaults to No.

F.3 GUI Parameters Not in the Registry

Users of the Global Windows Workstation, who are familiar with the contents of the [miscellaneous] section of the GSMWIN.INI file will recognise that the following options are not available in the Global System Manager (Windows NT) Registry:

ExitOn\$BYE

ExitOn\$E

SendInitialEscape

SignOn

PollRestartTimer

ButtonToDispLog

ButtonWidth

ButtonHeight

ButtonOffset

ButtonSpacing

The above options are listed for completeness only.

Appendix G - Troubleshooting Guide

This appendix contains a list of commonly encountered problems and misunderstandings that have been experienced with Global System Manager (Windows NT) together with the recommended solutions.

- G.1 What is the BACNAT variant number and why is it so important?
- G.2 Global System Manager (Windows NT) and Other Configurations
- G.3 Enabling API Error messages
- G.4 The Default GUI Sub-System Requires Customisation
- G.5 Loading Global Servers Too Quickly after Windows NT Bootstrap
- G.6 Captured Printers
- G.7 Serial Consoles not supported on Windows 95
- G.8 The DOSPRINT Printer Controller and serial characteristics
- G.9 Enabling the diskette drive on a Global Server
- G.10 Long volume descriptions are persistent
- G.11 Non-alphanumeric characters in Windows NT data file names (\$FCHA)
- G.12 Data file directories do not have to be in the Global directory
- G.13 Registry DDFn, IDFn, Screen\n numbers start from 0 & 1
- G.14 No Discrete Data File Reorganisation Utility
- G.15 Advanced SETUP Options
- G.16 Advanced UNINSTALL Options
- G.17 File Server Performance Issues
- G.18 \$TAPE and Global System Manager (Windows NT)
- G.19 \$REMOTE and Global System Manager (Windows NT)
- G.20 SPD and Global System Manager (Windows NT)
- G.21 PCWS File Transfer and Global System Manager (Windows NT)
- G.22 Disk Cacheing and Global System Manager (Windows NT)
- G.23 RAM Disk and Global System Manager (Windows NT)
- G.24 No =.NNNN supplied with Global System Manager (Windows NT)
- G.25 \$COBOL and Global System Manager (Windows NT)
- G.26 Various problems with Discrete Data Files
- G.27 Files per sub-volume and Discrete Data Files
- G.28 GSM (Windows NT) loader uses the installed sub-volume number
- G.29 Capacity reported by \$U
- G.30 Spare space reported by \$F
- G.31 GSM and Windows NT filing systems 2Gb, and larger
- G.32 Using GLSSTART to Restart Global Servers
- G.33 Installing a SYSRES on a non-Master Server (Wide-Area Networks)
- G.34 Issues with the HKEY_CURRENT_USER Hive
- G.35 Don't use DHCP for Global Servers
- G.36 Unique Endpoints only apply to one computer
- G.37 Shared SYSIPL volume, GL-IPL.DLV, forbidden
- G.38 Global Server Front-End
- G.39 Installing "mature" applications
- G.40 Changing the Master Server Node-id
- G.41 Changes to the Registry are not Recognised Immediately
- G.42 Copying Data while Global System Manager is running

G.1 What is the BACNAT variant number and why is it so important?

On other implementations of Global System Manager (e.g. Global System Manager (MS-DOS and Windows) and Global System Manager (Novell)) the "nucleus" components are distributed in a collection of libraries and stand-alone files on the Global format BACRES volume.

With Global System Manager (Windows NT), the situation is different. The libraries (i.e. +.W0 and +.W1) and stand-alone files (e.g. %.W1D) on the Global format BACRES volume are dummy components present on the volume so that standard generation and installation jobs may be used for **all** versions of Global System Manager. Those users who are familiar with Global System Manager (Unix) will be aware of this software architecture.

The various executable, binary files that comprise the "nucleus" are distributed on the Windows BACNAT media (currently a series of diskettes). Thus, in general, it is not possible to provide zaps to fix problems with the Global System Manager (Windows NT) nucleus. The only mechanism to distribute upgraded software is to provide a new BACNAT volume(s). An option in the Setup utility is available to update the "BACNAT components" (see section 2.7.3).

The packaging process that creates the BACNAT volume generates a unique "variant number". Thus, given a BACNAT variant number TIS Software support staff can immediately identify which sources, and which versions of those sources, were compiled to produce the BACNAT components.

The BACNAT variant number is displayed by the About/Global Client option from the Help menu on the main Global Client window. This variant number consists of 2 parts:

Global Client Vn.n
Global Windows Workstation Vm.m

The first variant number (i.e. n.n) refers to the version of the base Global System Manager (Windows NT) nucleus. The second variant number (i.e. m.m) refers to the version of the Graphical User Interface (GUI) sub-system. **BOTH NUMBERS SHOULD BE SUPPLIED WHEN LOGGING PROBLEMS WITH THE SERVICE CENTRE.**

The BACNAT variant of the base Global System Manager (Windows NT) nucleus is also displayed by the About option from the Help menu on the Global Server window; and by the \$S utility.

G.2 Global System Manager (Windows NT) and Other Configurations

This section describes some differences between the Global System Manager (Windows NT) software architecture and other Global System Manager configurations.

G.2.1 GSM (Windows NT) and GSM (Unix)

In some aspects, the Global System Manager (Windows NT) software architecture most closely resembles that of Global System Manager (Unix). Both architectures include a nucleus that is written in C (for Unix) or a mixture of C and C++ (for Windows NT). The Global System Manager nucleus executes on a virtual memory operating system and requires the appropriate driver software for the host operating system to be available in order to access peripheral devices (e.g. tapes, printers, serial screens). However, there are several important differences:

- Global System Manager (Windows NT) supports true Client-Server networking (true networking is not currently supported on Global System Manager (Unix));
- Although both architectures support multiple domains on the same computer so that, for example, domains A00 and B00 can both be established on a particular computer, the internal architecture is radically different.

For GSM (Windows NT), two separate Server processes are initiated which function as independent Global Servers (i.e. two instances of GLSERVER.EXE are executing concurrently). These Global Servers respond to Remote Procedure Calls (RPC) from the various intra-computer and inter-computer Global Clients.

For GSM (Unix) the multiple servers are emulated by multiple entries (i.e. one for SYSTEM-A and another for SYSTEM-B) in Unix Shared Memory. The various "Global Client" processes (i.e. glintd) "attach" to either SYSTEM-A or SYSTEM-B by accessing the relevant section of Shared Memory;

- **By default**, multi-user GSM (Unix) configurations consist of a number of single-user Global Client processes (i.e. 1 per user). Users connected to "dumb screens" are presented with a Unix login prompt. When they are logged in to Unix they initiate Global System Manager by running the "global" Unix command. Users on serial screens are effectively independent of the user on the integral screen

Windows NT is not, by default, a true multi-user operation system. Users connected to "dumb screens" are not presented with a Windows NT login. In order for a Global System Manager user to login on a serial screen, a multi-user Global Client must be running (initiated from another user on the integral screen).

- On Global System Manager (Unix) configurations, the Global configuration file is augmented by the Unix Systems file. For Global System Manager (Windows NT) configurations, the Registry is (roughly) equivalent to the Systems file;
- Global System Manager (Windows NT) uses a more sophisticated sizing algorithm than Global System Manager (Unix) when the capacity of the filing system is 2Gb, or higher (see section G.31).

G.2.2 GSM (Windows NT) and GSM (NetWare Novell)

Many users of Global System Manager (Novell NetWare) are expected to migrate to Global System Manager (Windows NT) to take advantage of more powerful multi-processor platforms and future enhancements to Global System Manager. There are several important differences between Global System Manager (Windows NT) and Global System Manager (Novell NetWare) that should be considered before a migration is attempted. These differences affect both the basic architecture and the networking sub-system. This section just describes the differences in the network sub-systems (section G.2.3 describes the important differences in the non-networking modules):

- On Global System Manager (Novell NetWare) configurations each dedicated Global file-server runs as a NetWare Loadable Module

(i.e. NLM) on a Novell NetWare server. No client application software can run on the Novell server, so all Global System Manager (Novell NetWare) clients run on NetWare workstations. Although the GSM.NLM includes a menu-driven front-end allowing user dialogue, the menus only allow diagnostics and house-keeping chores to be performed on the server. Global applications can't be run on the Novell server.

On Global System Manager (Windows NT), although each Global Server process operates as dedicated file-server, it is possible to run Global applications on the computer hosting the Global Server by configuring a Global Client on that computer;

- As mentioned above, the Global System Manager (Novell NetWare) GSM.NLM front-end allows a wide variety of "house-keeping" chores to be performed on the file-server (e.g. listing and closing open files, listing and releasing Global locks). The current version of the Global System Manager (Windows NT) Global Server process contains a very primitive front-end;
- The Client-Server interface on Global System Manager (Novell NetWare) uses the relatively low-level SPX protocol. The Client-Server interface on Global System Manager (Windows NT) uses the high-level RPC mechanism;
- Currently, it is only possible to run a single GSM.NLM on a NetWare server (although it is possible to run multiple GSM.NLM's on multiple Novell servers - one GSM.NLM per server). Any number, up to 26, Global System Manager (Windows NT) Servers can be run on a Windows NT computer (i.e. server or workstation);
- Although not recommended, it is possible to run a non-dedicated Global System Manager (Novell NetWare) server (i.e. GSMLOAD.EXE rather than GSM.NLM) on a Novell workstation. Such a hybrid process is not possible on a Global System Manager (Windows NT) configuration. If a workstation is to function as both a file-server and an application client then both a Global Server (e.g. node-id "B") **AND** a Global Client (e.g. node-id 27) must be running on the same computer.

G.2.3 GSM (Windows NT) and GSM (MS-DOS and Windows)

Many users of Global System Manager (MS-DOS and Windows) who are running on Windows 3.1, 3.11 and Windows 95 are expected to migrate to Global System Manager (Windows NT) to take advantage of more powerful multi-processor platforms and future enhancements to Global System Manager. There are several important differences between Global System Manager (Windows NT) and Global System Manager (MS-DOS and Windows):

- Global System Manager (MS-DOS and Windows) operates as a "real-mode, DOS application". Even when running on Windows 3.1, 3.11 and Windows 95, Global System Manager (MS-DOS and Windows) is running as a 16-bit DOS application. This implementation provides some advantages (e.g. in general, peripheral devices and hardware can be accessed directly) but also incurs several disadvantages (e.g. dedicated Windows printers can't be accessed). Global System Manager (Windows NT) operates as a full 32-bit Windows application (making extensive use of the Win-32 API);

- The Global System Manager (MS-DOS and Windows) nucleus is written in 80x86 assembler (with a few "assist functions" written in C). The Global System Manager (Windows NT) nucleus is written entirely in C and C++;
- The Graphical User Interface (GUI) on a Global System Manager (MS-DOS and Windows) configuration runs as a separate process (i.e. the Windows application GSMWIN.EXE) which communicates with the Global System Manager kernel (i.e. GSMLOAD.EXE, and derived modules) via a highly-specialised Shared Buffer interface.

The GUI sub-system on a Global System Manager (Windows NT) configuration is an integral part of the Global System Manager (Windows NT) nucleus (i.e. GLOBAL.EXE);

- On Global System Manager (MS-DOS and Windows) configurations, the Global configuration file is augmented by the GSM.INI file (a simple DOS text-file). For Global System Manager (Windows NT) configurations, the Registry is (approximately) equivalent to the GSM.INI file;
- Global System Manager (Windows NT) uses a more sophisticated sizing algorithm than Global System Manager (MS-DOS and Windows) when the capacity of the filing system is 2Gb, or higher (see section G.31).

G.2.4 GSM (Windows NT) and GSM (BOS)

Many users of Global System Manager (BOS) are expected to migrate to Global System Manager (Windows NT) to take advantage of more powerful multi-processor platforms and future enhancements to Global System Manager. There are several important differences between Global System Manager (Windows NT) and Global System Manager (BOS):

- The Global System Manager (BOS) nucleus is written entirely in 80x86 assembler. The Global System Manager (Windows NT) nucleus is written entirely in C and C++;
- On Global System Manager (BOS) the limited range of peripheral device and hardware supported are accessed via specialised "BOS device drivers". A new BOS device driver must be written for each new hardware device supported.

Global System Manager (Windows NT) operates as a standard Windows application. In general, any peripheral device supported by Windows should be accessible by Global System Manager (Windows NT). However, there are some important exceptions to this general rule: Please consult the Global Configuration Notes for details of peripheral devices supported by Global System Manager (Windows NT);

- Global System Manager (BOS) does not include a directly-connected Graphical User Interface (GUI) - although the Global Windows Workstation can be used to run terminal emulation sessions on serially connected PC's.

The GUI sub-system on a Global System Manager (Windows NT) configuration is an integral part of the Global System Manager (Windows NT) nucleus (i.e. GLOBAL.EXE);

- On Global System Manager (BOS) configurations, the Global configuration file defines the computer configuration completely. For Global System Manager (Windows NT) configurations, the Registry augments (and in some areas, replaces) the Global configuration file;
- Although Global System Manager (BOS) networking may appear to be more powerful than Global System Manager (Windows NT) networking (i.e. non dedicated, multi-user Global file-servers can be configured), the same effect can be achieved by running a Global Server/Global Client pair on every non-dedicated file-server. Note that Global System Manager (BOS) only supports the Arcnet hardware layer, Global System Manager (Windows NT) should support any network environment supported by the RPC interface (e.g. SPX on Ethernet, TCP/IP on Ethernet etc.).

G.3 Enabling API Error messages

The API error box (as documented in sections C.1.4 and C.2.3 for the Global Client and Global Server, respectively) is a useful technique for trouble-shooting problems when the Global System Manager error message provides insufficient information to resolve the issue. For example, the \$TAPE controller returns an error "Z" when a Windows API call returns an unrecognised result code. The error "Z" will be displayed as "ERROR Z ON TAPE..." by \$TAPE. The actual result code, returned by Windows, will not be displayed by \$TAPE so the fundamental cause of the failure cannot be determined. This "loss of information" will obviously make problem diagnosis and correction more difficult. The API Error Box includes the crucial Windows result code together with a descriptive error message. These extra details should normally provide enough information to resolve the problem.

Important note: API error messages should NOT be enabled permanently. This is particularly important for all Global Servers; and any Global Clients with multi-user configurations because the API Error Box will freeze the Global process (i.e. hang all other users or attached Global Clients) until the OK button is clicked.

G.4 The Default GUI Sub-System Requires Customisation

As explained in Chapter 5 and Appendix F, the GUI sub-system is heavily customisable. The default customisation is compatible with early releases of the Global Windows Workstation (GUI) product and will almost certainly require considerable customisation to provide a true Windows "look-and-feel".

Important note: Future releases of Global System Manager (Windows NT) may include default GUI sub-system customisations that provide a vastly different (and more Windows compatible) GUI look-and-feel.

NEVER RELY ON THE DEFAULT GUI SUB-SYSTEM LOOK-AND-FEEL BUT ALWAYS BE PREPARED TO TAILOR ACCORDING TO YOUR SPECIFIC REQUIREMENTS.

G.5 Loading Global Servers Too Quickly after Windows NT Bootstrap

A problem was encountered during development when a Global Server was loaded immediately after logging on to Windows NT. The error implied the network protocol wasn't available at that stage, although all subsequent attempts to load the Global Server were successful. This

restriction could cause a problem if a Global Server is initiated as a Windows startup program.

G.6 Captured Printers

Windows 95 includes a facility to capture print output directed to a device (e.g. LPT1:) and redirects it to a Windows printer (which could be connected to another computer on a network). **This facility MUST not be used with the DOSPRINT controller (see section 8.5.1).** The DOSPRINT controller should only be used with printers connected directly to the local computer. Only the WINPRINT controller (see section 8.5.2) should be used to print to Windows and network printers.

G.7 Serial Consoles not supported on Windows 95

The various serial port parameters (e.g. baud rate, number of data bits, etc.) for Global System Manager (BOS), Global System Manager (MS-DOS and Windows) and Global System Manager (Novell NetWare) configurations are specified in the Global configuration file. These parameters are used by the relevant serial screen controller (e.g. TTY) when Global System Manager is loaded (i.e. at bootstrap time) to initialise the serial hardware.

This behaviour contrasts with the Global System Manager (Unix) serial screen controller which leaves the configuration and setting of all serial port parameters to the Unix operating system.

Global System Manager (Windows NT) uses a mixture of these two methods. The serial port parameters, which are configured by Windows using Control Panel, are applied to the port by the serial console controller, SERIAL, when a multi-user Global Client is initiated. Note that although these parameters are configured by Windows NT the new settings are not applied to the port. It is the responsibility of the application which makes use of the port to apply them. The port configuration details, which are stored in the Registry, should be read by the application and then applied using an API call. The following fixed Registry key:

```
HKEY_LOCAL_MACHINE\Software\Microsoft\Windows
NT\CurrentVersion\Ports
```

is used on both Windows NT 3.51 and V4.0. However, there is no fixed key for serial port characteristics in Windows 95. Consequently, **serial consoles are not supported on Windows 95.**

G.8 The DOSPRINT Printer Controller and serial characteristics

The various serial port parameters (e.g. baud rate, number of data bits, etc.) for Global System Manager (BOS), Global System Manager (MS-DOS and Windows) and Global System Manager (Novell NetWare) configurations are specified in the Global configuration file. These parameters are used by the relevant serial printer controller (e.g. S.PRINT) when Global System Manager is loaded (i.e. at bootstrap time) to initialise the serial hardware.

This behaviour contrasts with the Global System Manager (Unix) DIRECT printer controller which leaves the configuration and setting of all serial port parameters to the Unix operating system.

Global System Manager (Windows NT) uses a mixture of these two methods. The serial port parameters, which are configured by Windows using Control Panel, are applied to the port by the DOS printer controller, DOSPRINT, when a Global Client is initiated. Note that although these parameters are configured by Windows NT the new settings are not applied to the port. It is the responsibility of the application which makes use of the port to apply them. The port configuration details, which are stored in the Registry, should be read by the application and then applied using an API call.

The following fixed Registry key:

```
HKEY_LOCAL_MACHINE\Software\Microsoft\Windows
NT\CurrentVersion\Ports
```

is used on both Windows NT 3.51 and V4.0. However, there is no fixed key for serial port characteristics in Windows 95. Consequently, although serial printers are supported on Windows 95, the serial port characteristics are not modified.

Important note: The DOSPRINT printer controller only attempts to initialise the port for "serial" Windows devices "COMn".

G.9 Enabling the diskette drive on a Global Server

The default configuration file supplied for use by Global Servers includes a diskette entry (see section 9.2.3) which is reported as a missing device (i.e. the units do not appear in a \$U listing). The use of the diskette is controlled by the Diskette value in the Registry (see sections 8.2.3.2 and 9.2.3.2). This value is used to enable/disable the diskette for Global Clients and Global Servers. The diskette drive on a computer cannot be shared by the Global Client and Global Servers configured on that computer. The SETUP utility (see section 2.2) only enables the diskette for the Global Client. If the diskette drive is considered to be more useful as a resource attached to a Global Server then the following changes must be applied to the Registry:

- If a Global Client is installed then either remove the Diskette value from the following Registry key (or set its value to 0):

```
HKEY_LOCAL_MACHINE\Software\Global\Client\Data
```

- Add the Diskette value name with a value of 1 to the following Registry key:

```
HKEY_LOCAL_MACHINE\Software\Global\Servers\x\Data
```

(where x is the node id of the chosen Global Server).

G.10 Long volume descriptions are persistent

All the 50 character Long Volume Descriptions for a data directory are held in the 00dddddd.SVL domain file rather than being associated with individual data files (e.g. nnvvvvvv.SVL). If a data file is copied to a data directory using a Windows NT command (e.g. Explorer) it will automatically inherit the Long Volume Description associated with the corresponding sub-volume number.

G.11 Non-alphanumeric characters in Windows NT data file names (\$F CHA)

As explained in section 8.2.1 any non-alphanumeric characters that would be expected to be present in the name of a Windows sub-volume file are filtered out by the DDF controller. Thus, there are never any problems when using the \$F CHA command to change the name of a sub-volume that would involve creating a Windows file with an illegal name. For example, renaming sub-volume 210 to "AB*\CD" will result in a corresponding Windows SVL file rename to file 10ABCD.SVL (rather than the illegal 10AB*\CD.SVL file name).

G.12 Data file directories do not have to be in the Global directory

Although the recommended default directory for all data file directories (e.g. GSMA00, GSMB00 etc.) is within the Global directory, this default may be over-ridden by specifying an absolute directory path in the Registry (see sections 8.2.1.2 and 9.2.1.2).

G.13 Registry DDFn, IDFn, Screen\n numbers start from 0 & 1

The DDFn and IDFn numbers in the Registry (that correspond to DRIVE NUMBER's in the configuration file - see sections 8.2.1.1, 8.2.2.1, 9.2.1.1 and 9.2.2.1) are numbered from 0. However, the Serial\n numbers in the Registry (that correspond to "Screen numbers" in the configuration file - see section 8.3.2.1) are numbered from 1. A serial\n number of 0 is invalid. A configuration file Screen Number of 0 has a special meaning (see section 8.3.2.1).

G.14 No Discrete Data File Reorganisation Utility

Users who are familiar with Global System Manager (MS-DOS and Windows) or Global System Manager (Novell NetWare) may be surprised that an equivalent of the GLENDDF.EXE utility is not available with Global System Manager (Windows NT) configurations.

Similarly, users who are familiar with Global System Manager (Unix) may be surprised that an equivalent of the glreorg utility is not available with Global System Manager (Windows NT) configurations.

A facility to allow Discrete Data File domains to be reorganised, without recourse to \$REORG (see section 4.5) MAY be available in future revisions of Global System Manager (Windows NT).

G.15 Advanced SETUP Options

The SETUP utility (see section 2.2) can be run in a diagnostics mode by specifying the following command line:

```
setup -ad
```

When run in this mode it offers the same choices as in non-diagnostics mode but displays the state of all its internal variables before copying files.

DO NOT USE THIS OPTION UNLESS ADVISED TO DO SO BY THE SERVICE CENTRE.

G.16 Advanced UNINSTALL Options

The Uninstall option should always be run from its icon (Windows NT V3.51) or from the Add/Remove software option in Control Panel (Windows NT V4.0 and Windows 95) - see section 2.10. If it is ever necessary to run UNINST.EXE (supplied on the BACNAT media) from the command line then a single parameter must be supplied. The mandatory single parameter must be the name of the "Install Log File" that was created when Global System Manager was installed. The file-name **MUST** be prefixed by "-f". For example:

```
UNINST.EXE -fC:\GSM\DELS1.ISU
```

G.17 File Server Performance Issues

It is not advisable to run a processor-intensive Screen Saver on any computer that is running a Global Server process. Running a Screen Saver on a file server computer can seriously impair the performance and response time of the Global Server.

Similarly, to avoid performance issues, you are **STRONGLY ADVISED** to never run a Global Server on a Windows NT Primary Domain Controller (PDC) or Backup Domain Controller (BDC). In general, a Windows NT Server configured as either a PDC or BDC should be dedicated solely for that use.

G.18 \$TAPE and Global System Manager (Windows NT)

\$TAPE V7.1, and later, includes support for Global System Manager (Windows NT) computers. This section describes some special factors that must be considered when using \$TAPE on Global System Manager (Windows NT).

For Global System Manager (BOS) computers, the "\$TAPE software" consists of three components:

\$TAPE	\$TAPE Cobol front-end;
TAPEnn	Various Cobol overlays in P.\$TAPE library;
AmCTnn hardware):	Assembler tape controllers (interface to
	am = Machine-code (e.g. J5 for the IBM PC)
	nn = Tape controller number (e.g. 03 = AHA SCSI)

For Global System Manager (Windows NT) computers, the "\$TAPE software" consists of four components:

\$TAPE	\$TAPE Cobol front-end (as above);
TAPEnn above);	Various Cobol overlays in P.\$TAPE library (as
W1CT01	Dummy tape controller;
GLOBAL.EXE	Real tape controller (uses Windows API calls) within the GLOBAL.EXE module. Note that GLOBAL.EXE is distributed on the BACNAT media.

\$TAPE loads the relevant tape controller onto the Global Cobol User Stack within the Cobol User Area. On Global System Manager (BOS) it is

perfectly permissible to execute assembler code loaded within a Cobol User Area (i.e. on the Cobol stack). However, on Global System Manager (Windows NT) the Windows NT kernel treats the Cobol User Area as a "data segment" so that it is not possible for \$TAPE to invoke a C tape controller on the Cobol User Stack. To circumvent this problem, the dummy W1CT01 module supplied with \$TAPE V7.1 contains a Cobol ESCAPE instruction followed by a data area that redirects the C version of the Commercial Code Interpreter (CCI) to the real tape controller within GLOBAL.EXE (via a jump-table, also in GLOBAL.EXE). This technique is used for the other C "assembler assist modules" (e.g. %.W1D etc.).

If the entry-point to the real tape controller is missing from the jump-table the CCI will return a "STOP with 772". This error (which should never occur on released software) will be displayed as:

```
$91 TERMINATED - STOP CODE 772
```

Note that versions of \$TAPE earlier than V7.1 (i.e. V7.0A, V7.0, V6.0A and V6.0) did not include the W1CT01 module in P.\$TAPE so will fail with the following error message if run on a Global System Manager (Windows NT) configuration:

```
ERROR LOADING CONTROLLER W1CT01,
```

When \$TAPE is used with Global System Manager (BOS), a tape controller entry must be present in the configuration file (e.g. ADAPTEC, AHA-TAPE). This entry creates a TA-block within the configuration data which is used to pass configuration parameters (e.g. port address) and \$TAPE operations to the tape controller. When \$TAPE is used with Global System Manager (Windows NT) the TA-block, which does not contain any configuration parameters, is part of the DATA DIVISION of \$TAPE itself. Consequently, an entry within the TAPE CONTROLLER section of the configuration file is not strictly necessary for Global System Manager (Windows NT) configurations.

G.18.1 Specifying the Tape Device

Section 8.4.1.2 describes how the name of the Windows Tape device must be specified in the Registry.

If this Registry value is not established then an error D (missing device error) will be reported when attempting to run \$TAPE.

G.18.2 Options screen settings

Since most tape save and restore operations will be performed on a Global Client directly to a domain on a Global Server, the "Use Staging unit?" option should be disabled by setting the flag to "N" in the \$TAPE Options screen.

G.18.3 Data transfer between Windows NT and non-Windows NT configurations

The Global System Manager (Windows NT) \$TAPE tape controller supports both "file-mark" and "non-file-mark" mode (see section 8.4.1.2). Consequently, the portability issues that arise with the Global System Manager (Unix) \$TAPE tape controller do not occur on Global System Manager (Windows NT) configurations.

Similarly, the Global System Manager (Unix) "no rewind device" issue is not relevant for Global System Manager (Windows NT) configurations.

G.18.4 \$TAPE is Not Supported on Windows 95

A Global System Manager (Windows NT) \$TAPE tape controller makes extensive use of the tape backup functions provided in the Win32 API (Application Programming Interface). The major advantage of using these functions is that \$TAPE should function with all tape drives supported by Windows NT since the API functions provide a hardware independent interface to the tape drive. However, the various tape functions in the API are NOT supported on Windows 95, since the tape backup facilities are not as tightly integrated in the Windows 95 operating system as they are in Windows NT.

The corollary of this restriction is that \$TAPE is not supported on Windows 95. If \$TAPE is executed on a Global Client running on Windows 95 the following message will be displayed:

* ERROR 0 INITIALISING TAPE CONTROLLER

G.18.5 \$TAPE and Uninitialised Tapes

If \$TAPE is used to initialise a factory-fresh (i.e. completely blank) tape an "ERROR Z ON TAPE..." will be reported immediately. Although this error message is displayed \$TAPE will continue with the initialise operation which will complete successfully. If the ERROR Z is considered a problem then the "Read Tape Before Initialise?" option (see section 3.13 of the \$TAPE V7.0 Manual) must be set to "N" before attempting to initialise a blank tape.

G.19 \$REMOTE and Global System Manager (Windows NT)

\$REMOTE is NOT supported on Global System Manager (Windows NT).

G.20 SPD and Global System Manager (Windows NT)

The Serial Port Driver (SPD) is NOT supported on Global System Manager (Windows NT).

G.21 PCWS File Transfer and Global System Manager (Windows NT)

The PCWS FTRAN file transfer utility is NOT supported on Global System Manager (Windows NT).

G.22 Disk Cacheing and Global System Manager (Windows NT)

Disk cacheing is NOT supported on Global System Manager (Windows NT). There is no benefit supporting Global System Manager disk cacheing on a virtual memory operating system such as Windows NT. Firstly, the Windows NT cacheing algorithm is considerably more efficient than Global System Manager cacheing. Secondly, the virtual memory allocated by a Global System Manager disk cache may be swapped to hard-disk by the Windows NT virtual memory handler!

G.23 RAM Disk and Global System Manager (Windows NT)

A RAM Disk is NOT supported on Global System Manager (Windows NT). There is no benefit supporting a RAM Disk on a virtual memory operating system such as Windows NT: The virtual memory allocated by a

Global System Manager RAM Disk may be swapped to hard-disk by the Windows NT virtual memory handler!

G.24 No =.NNNN supplied with Global System Manager (Windows NT)

The =.NNNN customisation utility supplied with GSM (BOS), GSM (MS-DOS and Windows) and GSM (Novell NetWare) configurations is used mainly to update controller specific information in the Global configuration file without recourse to Global Configurator. The configuration file on Global System Manager (Windows NT) configurations contains considerably less controller specific information than in any of the various "real-mode" configurations listed above because most of these details are held in the Windows Registry (see Chapters 7, 8 and 9). This gradual move away from the Global configuration file to the Windows registry is likely to continue. The heavy use of the Windows Registry makes a =.NNNN customisation utility (i.e. =.5661) inappropriate for Global System Manager (Windows NT) configurations.

G.25 \$COBOL and Global System Manager (Windows NT)

The Global Cobol compiler, \$COBOL, is supported on all Global System Manager (Windows NT) configurations.

This section describes some special factors that must be considered when using \$COBOL on Global System Manager (Windows NT).

For Global System Manager (BOS) computers, the "\$COBOL software" consists of four sets of components:

\$COBOL	\$COBOL Cobol front-end;
\$COBnn	Various compiler overlays written in Cobol;
\$COBnn	Various compiler overlays written in the TRAMS language (The TRAMS language is a proprietary language designed for writing compilers);
\$aTRAM	TRAMS language interpreter (written in assembler), a = Architecture-code (e.g. J for 80x86-based computers);

For Global System Manager (Windows NT) computers, the "\$COBOL software" consists of five sets of components:

\$COBOL	\$COBOL Cobol front-end;
\$COBnn	Various compiler overlays written in Cobol;
\$COBnn	Various compiler overlays written in the TRAMS language (The TRAMS language is a proprietary language designed for writing compilers);
\$WTRAM	Dummy TRAMS language interpreter;
GLOBAL.EXE	Real TRAMS language interpreter (written in C) within the GLOBAL.EXE module. Note that GLOBAL.EXE is distributed on the BACNAT media.

\$COBOL loads the TRAMS interpreter onto the Global Cobol User Stack within the Cobol User Area. On Global System Manager (BOS) it is perfectly permissible to execute assembler code loaded within a Cobol User Area (i.e. on the Cobol stack). However, on Global System Manager (Windows NT) the Windows NT kernel treats the Cobol User Area as a "data segment" so that it is not permissible for \$COBOL to invoke the C version of the TRAMS interpreter on the Cobol User Stack. To circumvent this problem, the dummy \$WTRAM module, supplied with the V8.1 Global Development System, contains a Cobol ESCAPE instruction followed by a data area that redirects the C version of the Commercial Code Interpreter (CCI) to the real TRAMS interpreter within GLOBAL.EXE (via a jump-table, also in GLOBAL.EXE). This technique is used for the other C "assembler assist modules" (e.g. %.W1D etc.).

If the entry-point to the real TRAMS interpreter is missing from the jump-table the CCI will return a "STOP with 772". This will be displayed as either:

```
$91 TERMINATED - STOP 772
```

or:

```
SORRY - YOU ARE ATTEMPTING TO USE A SERVICE THAT IS NOT PART
OF YOUR OPERATING SYSTEM.
```

All released versions of the Global System Manager (Windows NT) BACNAT software include the TRAMS interpreter.

G.26 Various problems with Discrete Data Files

This section describes a number of problems that may occur when using Discrete Data Files (see sections 8.2.1 and 9.2.1).

G.26.1 Multiple Domain Header Files

When a Discrete Data file directory (e.g. GSMA00) is created by GLDFMAIN.EXE (see section 6.6) a 64Kb "domain header" file, OOSYSDOM.SVL, is created in that directory. The "domain header" file is renamed to 00xxxxxx.SVL (where xxxxxx is the domain volume name e.g. DOMAIN) when \$V is used to initialise the domain. The DDF directory (e.g. GSMA00, GSM200, etc.) MUST contain only one "header file" with the name 00*.SVL (where * is the Windows NT wildcard character). Any DDF directory that contains multiple header-files is considered invalid by Global System Manager. If the Windows NT utility (e.g. Explorer) is subsequently used to copy sub-volume files to a DDF directory be extremely careful not to copy the 00xxxxxx.SVL "header file".

If a DDF directory contains more than one file with a filename of 00*.SVL (where * is the Windows NT wildcard character), the Global Server will not recognise the Discrete Data File domain, reporting a "Missing Device" error (i.e. an error "D"). The following message will be displayed on the Server's diagnostic window:

```
Error D initialising domain
```

If the domain contains the Master SYSRES volume, the error "D" will prevent Global Clients configured to use the Shared SYSRES (i.e. Global Clients without a local SYSRES unit) from loading.

Similarly, a Global Client, configured with a Local DDF domain will not recognise the Discrete Data File, reporting a "Missing Device"

error (i.e. error "D"). If the local domain contains the local SYSRES directory, the Global Client will fail to load.

G.26.2 Multiple Domain Sub-Volume Files

The DDF directory (e.g. GSMA00, GSM200, etc.) MUST contain only one "sub-volume file" for each numeric sub-volume. For example, only one 01*.SVL file, only one 02*.SVL file etc. (where * is the Windows NT wildcard character). Any DDF directory that contains multiple sub-volume-files is considered invalid by Global System Manager.

If a DDF directory contains more than one sub-volume file with the same sub-volume number, the Global Server will not recognise the corresponding sub-volume. The following messages will be displayed on the Server's diagnostic window:

```
Sub-volume nnnvvvvv.SVL is multiply defined
Sub-volume nnnvvvvv.SVL is multiply defined
```

For example:

```
Sub-volume 02TEST1.SVL is multiply defined
Sub-volume 02TEST2.SVL is multiply defined
```

The sub-volume will be ignored and will be excluded from a \$F (or \$V) listing of the domain. Furthermore, an ERROR Z will be reported at the end of the domain directory listing. If the sub-volume is the Master SYSRES, its removal will prevent Global Clients configured to use the Shared SYSRES (i.e. Global Clients without a local SYSRES unit) from loading.

Similarly, a Global Client, configured with a Local DDF domain that contains more than one sub-volume file with the same sub-volume number, will not recognise the Discrete Data File sub-volume (but no diagnostic messages will appear). The sub-volume will be ignored and will be excluded from a \$F (or \$V) listing of the domain. Furthermore, an ERROR Z will be reported at the end of the domain directory listing. If the sub-volume is the Local SYSRES, its removal will prevent the Global Client from loading.

G.26.3 Sub-Volume File Sizes must be an exact Multiple of 32Kb

The size of every file in a DDF directory (e.g. GSMA00, GSM200, etc.) MUST be an exact multiple of the Global System Manager virtual track size (i.e. 32Kb for format T259Z). When a "sub-volume" file is created by \$V, the size specified by the operator is always rounded up to be a multiple of 32Kb. Any sub-volume files within a DDF directory that are not multiples of the track size are considered invalid.

If a DDF directory contains a sub-volume file with an invalid size, the Global Server will not recognise the corresponding sub-volume. The following messages will be displayed on the Server's diagnostic window:

```
Sub-volume nnnvvvvv.SVL is not a multiple of the track size
```

For example:

```
Sub-volume 03TEST3.SVL is not a multiple of the track size
```

The sub-volume will be ignored and will be excluded from a \$F (or \$V) listing of the domain. Furthermore, an ERROR Z will be reported at the end of the domain directory listing. If the sub-volume is the Master SYSRES, its removal will prevent Global Clients without Local SYSRES units, from loading.

Similarly, a Global Client, configured with a Local DDF that contains a sub-volume file with an invalid size, will not recognise the Discrete Data File sub-volume (but no diagnostic messages will appear). The sub-volume will be ignored and will be excluded from a \$F (or \$V) listing of the domain. Furthermore, an ERROR Z will be reported at the end of the domain directory listing. If the sub-volume is the Local SYSRES, its removal will prevent the Global Client from loading.

G.26.4 Sub-Volume Files Must be Writable (not Read-Only)

Every file in a DDF directory (e.g. GSMA00, GSM200, etc.) MUST be writable.

If a DDF directory contains a read-only sub-volume file, the Global Server will not recognise the Discrete Data File sub-volume. The following messages will be displayed on the Server's diagnostic window:

```
Sub-volume nrvvvvvv.SVL is read only
```

For example:

```
Sub-volume 04TEST4.SVL is read only
```

The sub-volume will be ignored and will be excluded from a \$F (or \$V) listing of the domain. Furthermore, an ERROR Z will be reported at the end of the domain directory listing. If the sub-volume is the Master SYSRES, its removal will prevent Global Clients without Local SYSRES units, from loading.

Similarly, a Global Client, configured with a Local DDF that contains a read-only sub-volume file, will not recognise the Discrete Data File sub-volume (but no diagnostic messages will appear). The sub-volume will be ignored and will be excluded from a \$F (or \$V) listing of the domain. Furthermore, an ERROR Z will be reported at the end of the domain directory listing. If the sub-volume is the Local SYSRES, its removal will prevent the Global Client from loading.

G.27 Files per sub-volume and Discrete Data Files

When the maximum number of files per directory was increased from 99 to 250 (with the introduction of Global System Manager V6.2) checking was included in the File Executive to ensure that the maximum number of files per sub-volume on the initialised domain(s) matches the value in the configuration file. If the value on disk differs from that in the configuration data, the File Executive will return an error "V" (WRONG VOLUME FORMAT) when an attempt is made to access the domain. This checking is necessary to prevent possible data corruption caused by the inconsistent directory sizes (the size of the domain directory is a function of the maximum number of sub-volumes).

The checking that applies to real domains (e.g. P88Z), Integrated Data File Domains (e.g. P224Z) and Integrated Data File DLV's (e.g. Z151Z) has always been included in Global System Manager. The equivalent

checking for discrete data volumes (e.g. T259Z) has only been included in Global System Manager V8.1. If a directory size mismatch is detected by the new checking algorithm an error "v" (i.e. NOT error "V") will be returned.

It should not normally be necessary to amend the DDF or IDF controller section of the Global configuration file (see sections 8.2.1 and 8.2.2) because extra Discrete Data File Domains (DDF's) should be added by installing extra Global Servers. **If the DDF or IDF controller section of the configuration file is changed be extremely careful to ensure that the number of files per sub-volume in the configuration file agrees with the number of files per sub-volume on the existing data volumes.**

Note that the default number of files per sub-volume for volume format T259Z has always been 250. This consistency does not apply to other DDF volume formats described in section 8.2.1.4 and 9.2.1.4.

G.28 GSM (Windows NT) loader uses the installed sub-volume number

When the \$F INS instruction is used during the installation of a Global System Manager (Windows NT) Client with a Local SYSRES the sub-volume number of the SYSRES volume (i.e. normally 201) is patched into the Domain Header File (e.g. 00SYSDOM.SVL). This sub-volume number is used by the Global System Manager (Windows NT) loader when initiating the installed system. Unlike some other implementations of Global System Manager (e.g. GSM (MS-DOS)) it is NOT possible to copy another SYSRES sub-volume to a DDF directory and load Global System Manager from it, normally for testing purposes, unless the sub-volume number matches the number that was patched into the 00SYSDOM.SVL file when Global System Manager was installed.

For example, assuming the following files in the GSM200 directory:

```
00SYSDOM.SVL * Domain Header File
01SYSRES.SVL * Installed SYSRES
02SYSRES.SVL * Test SYSRES
```

the following technique (involving just a single file rename), to attempt to load from the 02SYSRES.SVL volume, by renaming the "live bootstrap volume" 01SYSRES.SVL volume, will not work:

```
RENAME 01SYSRES.SVL XXX01SYSRES.SVL
```

Instead, the following additional rename must be performed:

```
RENAME 02SYSRES.SVL 01SYSRES.SVL
```

to rename the test volume to the "live bootstrap volume"

Important note: The behaviour of Global System Manager (Windows NT) in this respect is identical to that of Global System Manager (Unix) but different from that of Global System Manager (MS-DOS and Windows).

G.29 Capacity reported by \$U

The data file CAPACITY displayed by \$U (see section 4.9) is slightly misleading. The CAPACITY does not refer to the size of the particular domain, but rather, it refers to the maximum capacity of the volume

format (i.e. 2047.7Mb for format T259Z). Thus, if two T259Z Discrete Data directories (e.g. GSMA00 and GSMB00) are present on the same filing system, a \$U list of both will display the same capacity. Don't be misled into thinking that each domain can be increased in size to the amount displayed!

G.30 Spare space reported by \$F

The amount of spare space displayed by the \$F (or \$V) list of a T259Z domain directory is slightly misleading. The spare space does not refer to the amount of space reserved for the particular domain, but rather, it refers to the "virtual spare space" available for that domain. The "virtual spare space" is calculated by subtracting the "first unused logical track" from the volume size of the partition (i.e. 2047.7Mb for format T259Z). If the result of this calculation (i.e. the "virtual free space") is higher than the actual free space available on the Windows filing system, the actual free space will be returned as the "free space". This complicated algorithm, which is considerably more sophisticated than employed by the Global System Manager (Unix) and Global System Manager (MS-DOS and Windows) DDF (aka SSD) controllers, will prevent the STOP 6604 errors that can sometimes occur when a DDF Domain directory becomes logically fragmented.

Note also if two Discrete Data File directories (e.g. GSMA00 and GSMB00) are present on the same filing system, a \$F list of both may display the same amount of spare space. Don't be misled into thinking that each domain can be increased in size by the amount displayed!

G.31 GSM and Windows NT filing systems 2Gb, and larger

All Global System Manager file addresses use a signed 4-byte, 32-bit quantity (i.e. a PIC 9(9) COMP variable). This limitation applies to both addresses within domains (i.e. sub-volume addresses) and addresses within sub-volumes (i.e. file addresses). Thus, the size of each Global System Manager domain is limited to a size of 2^{31} bytes (i.e. 2Gb-1). This limitation applies to all Global System Manager volumes regardless of type or configuration.

The Global System Manager (Windows NT) Discrete Data File controller in both the Global Client and Global Server ensures that each domain has 65536 tracks (thus setting the 2Gb limit for volume format T259Z; and 512Mb for volume formats T151Z and T224Z). In practice the actual addressable part of the domain is less than 2Gb due to various reserved tracks. In the case of Discrete Data File volume format T259Z, the limit is 2Gb - 32Kb. **THIS FIXED CAPACITY VALUE IS USED REGARDLESS OF THE ACTUAL PARTITION SIZE.**

Even though the total logical domain size may be larger than the physical partition size, Global System Manager will never attempt to allocate subunits which exceed the partition size since the allocation of new volumes is limited to the amount of free space available on the partition. For example, a 1Gb partition with 100Mb of free space will be reported as a 2Gb domain, but \$V will not be able to allocate a unit greater than 100Mb in size.

Note that the Global System Manager (Unix) DDF controller uses the Windows NT volume size (provided it is less than 2Gb) to fix the size of the DDF domain which is a more accurate value to use but may cause the following problem when allocating a subunit: The domain size (in

tracks) is an absolute limit in \$V and a "TERMINATED - STOP 6604" error will be displayed once the limit is exceeded. On IDF domains this limit will never be exceeded because the available "allocatable" space is always contained within the domain (i.e. at track addresses less than the limit). On DDF domains the track limit can be exceeded if a unit is deallocated because the deleted file's free space will be returned to the underlying file system, but the deallocated tracks are not returned to the Global System Manager domain (i.e. de-allocated tracks are not re-used as they would be on an IDF domain). When Global System Manager is re-loaded the DDF controller re-initialises the logical domain (of course no physical disk re-organisation takes place!) such that all subunits are positioned contiguously within the domain, however on systems which remain in constant use for long periods of time the STOP 6604 problem is likely to occur.

The Global System Manager (Windows NT) DDF controller avoids this problem by modifying the free space value returned to Global System Manager to be the minimum of the free space reported by Windows NT and the space remaining at the end of the 2Gb "virtual domain" to ensure that \$V cannot exceed the track limit. This avoids the problem that can occur with the Global System Manager (Unix) DDF controller that results in a free space value of 0 to be returned if the actual free space on the filing system is 2Gb, or higher.

G.32 Using GLSSTART to Restart Global Servers

The GLSSTART.EXE utility has three modes of operation (see section 6.5) of which the /ALL mode is probably the most useful for normal day-to-day operations. However, the /RESTART mode is useful in situations where a Global Server needs to be reconfigured (e.g. to add an extra DDF, without disturbing the rest of the network). This technique can also be used to dynamically include extra DDF domain subunits (i.e. *.SVL files) onto a network as follows:

- Install an extra Global Server (e.g. node Z) which will be used specially for the purpose of importing *.SVL files;
- When a new DDF domain subunit is required unload Global Server Z. This may result in a warning message indicating that there are Global Clients connected (see section 6.4.1). This message can be ignored if there is no current network activity to the server;
- Copy the new SVL file to the appropriate directory (e.g. C:\GSM\GSMZ00) ensuring its "unit number" does not clash with an existing file (see section G.26.2);
- Use the "Restart Global Servers" icon/Start menu entry to execute GLSSTART /RESTART and reload Global Server Z;
- The new subunit will be visible to the entire Global System Manager network.

Important note: If a Global Client connection is broken by unloading a Global Server the client is not informed about the disconnection and assumes the connection is still valid. If the Global Server is reloaded the Global Client will be able to access it using the previous valid, connection information. However, this circumvents the standard Global Client to Global Server connection procedure. Consequently, the Global Server will not update its connection list to

add the newly connected Global Client. If the Global Server is subsequently unloaded then it will NOT display the usual "Global Clients still connected" warning message (see section 6.4.1).

G.33 Installing a SYSRES on a non-Master Server (Wide-Area Networks)

The standard Global System Manager (Windows NT) installation (see section 2.2) establishes a SYSRES unit on the Master Server which the various Global Clients (actually, only those Global Clients without a Local SYSRES) will use as their SYSRES. This configuration is suitable where all computers are members of a Local Area Network (i.e. where there is a high-bandwidth network between the Global Clients and the Master Server). However, a single centralised SYSRES configuration will not function efficiently if the computers are configured in a Wide-Area Network with a relatively low-bandwidth link between the Master Server and one, or more, of the Global Clients.

In a Wide-Area Network configuration, it is advisable to install a shared SYSRES on all sites in the Wide-Area Network so that all Global Clients have access to a "locally" available SYSRES. The SETUP utility (see section 2.2) will only establish the Install Server batch file (GLINSSRV.BAT) on the computer selected to operate as the Global System Manager Master Server. Consequently, the following non-standard installation will be necessary (see Appendix H for details of all the standard installations).

For the purposes of this example assume that a Global System Manager Master Server has already been installed as node-id "A" with a SYSRES on unit A01; and another SYSRES is required on server node-id "B" (which is situated at a remote location). Follow the normal Global Server installation procedure for Global Server "B" but specify the Master Server node-id as "B" (instead of the normal "A"). This non-standard installation will ensure the Install Server batch file (i.e. GLINSSRV.BAT) is copied to the Global directory and is parameterised correctly. Note that if the Master Server node-id is specified as "A" when Global Server "B" is installed the Install Server batch file will **not** be established.

After SETUP has been used to install the BACNAT components, install the Global System Manager components from BACRES, BEA, etc. onto the unit which will become B01, **specifying the master SYSRES unit as A01**. This will ensure the correct information is patched into \$MONITOR on the SYSIPL unit (i.e. the \$M unit will be A01 and the startup components will be loaded from B01). Finally, use the Global Registry Editor to modify the MasterNodeID value in the following Registry key:

HKEY_LOCAL_MACHINE\Software\Global\Servers key

This will re-establish node-id "A" as the Master Server node (see section 9.9.1).

Important note: If the last stage is not completed all Global Clients which attempt to access Global Server "B" will fail with the following configuration error:

Differing GSM master nodes

since the MasterNodeID value for Global Server "B" will be set to "B" whereas the Global Clients will be configured to use Master node "A".

G.34 Issues with the HKEY_CURRENT_USER Hive

When installing a Global Client, the Operator-id and Terminal Type parameters are established in the HKEY_CURRENT_USER Hive (see section E.1). All entries in this Hive apply only to the current user. When running the installed Global Client, you must be running as the same "current user" in order for the parameters, established during installation, to be recognised. If you run a Global Client using a different "current user" from that used when the Global Client was installed, you will be prompted for an OPERATOR-ID (see section 3.2.2) and TERMINAL TYPE (see section 3.2.3). To avoid these prompts, use GLREGED.EXE (see Chapter 7) to establish values for the 2 ValueNames described in section 8.3.1.2.2.

G.35 Don't use DHCP for Global Servers

Each Global Client must be configured with the Network Address of every Global Server (see section 8.6.1.2.2). If any of the network parameters that specify a Global Server are changed, the corresponding Registry entries for the various Global Clients must be modified accordingly.

Obviously, the network addresses of the various Global Servers must be fixed otherwise the Global Clients Registry parameters will be continuously changing. Although the Windows DHCP technique is potentially useful on large networks, and can be used to dynamically allocate IP addresses for Global Clients, this inherently non-deterministic technique should not be used to allocate the "fixed" network addresses of Global Servers.

G.36 Unique Endpoints only apply to one computer

Although section 2.2.3.4.2 stresses that network Endpoints must be unique for all Global Servers, this requirement is not strictly true. The Endpoint parameter need only be unique for multiple Global Servers on the same computer. Thus the following configuration is allowed:

Server Node-id	Network Address	Endpoint
A	192.32.64.200	3000
B	192.32.64.200	3001
C	192.32.64.201	3000

Note that Server "C" can use the same Endpoint as "A" because they will be running on different computers (i.e. with different Network Addresses).

Although duplicate Endpoints are not strictly forbidden you are **STRONGLY ADVISED** to adhere to the guidelines in section 2.2.3.4.2 and use unique Endpoints for two reasons. Firstly, there is normally no shortage of possible Endpoints. Secondly, if a Global Server is moved from computer to another, a network containing duplicate Endpoints on a single computer may be inadvertently configured.

G.37 Shared SYSIPL volume, GL-IPL.DLV, forbidden

The Global Client SYSIPL DLV (i.e. GL-IPL.DLV) is always opened in non-shared, exclusive mode by the first Global Client that uses it. Consequently, it is not possible for other Global Clients to share this IPL volume.

THE GL-IPL.DLV FILE MUST BE COPIED FROM THE MASTER SERVER DIRECTORY TO A LOCAL HARD-DISK AFTER GLOBAL SYSTEM MANAGER HAS BEEN INSTALLED ON THE MASTER SERVER (SEE SECTION 2.8.2.1).

G.38 Global Server Front-End

The current version of the Global Server does not allow any "house-keeping" operations and only a limited range of diagnostics operations to be performed directly (see section 6.4). For example, it is not currently possible to report on open files or outstanding locks without running \$STATUS on a Global Client.

G.39 Installing "mature" applications

As explained in section 2.6.1 some "mature" Global applications (e.g. Global Finder, Nominal Ledger) can only be installed on a Local sub-volume (i.e. a unit number in the range 201 - 299). The installation of a "mature" product onto a "network visible" sub-volume must be performed in several stages:

- Install a Global Client configured with a Local DDF;
- Install the application using the Global Client with a Local DDF, onto a local sub-unit (e.g. unit 210);
- Unload the Global Server that is intended to access the application program unit. This step may involve unloading any Global Clients that are connected to the Global Server;
- Move the corresponding Windows sub-volume file (e.g. 10BFPROG.SVL) from the Discrete Data File domain directory of the Global Client (e.g. C:\GSM\GSM200) to the domain directory of the Global Server (e.g. C:\GSM\GSMA00) being careful to avoid any sub-volume number clashes (see section G.26.2). It may be necessary to move the data volumes (if any) associated with the application;
- Reload the Global Server(s) and a Global Client to perform any Global System Manager customisation necessary to reflect the re-numbered volumes (e.g. modify the menu to change the \$P assignment from 210 to A10).

G.40 Changing the Master Server Node-id

The Master Server Node-id (i.e. normally "A") must be identical for all Global Server and Global Clients in a network. The Master Server Node-id used by all Global Clients is ultimately obtained from the address of the Master SYSRES unit that is specified when Global System Manager is installed (see section A.14). This applies to both the Master Server installation (i.e. using the GLINSSRV.BAT batch file) and a Local SYSRES installation (i.e. using the GLINSCLI.BAT batch file).

The Master Server Node-id used by all Global Servers is obtained directly from the \$GLMACH\Server\MasterNodeID registry value (see section 9.9.1).

If the Master Server Node-id is every changed, both the explicit value (in the Registry) used by the Global Servers and the implicit value (PAM'ed into \$MONITOR by the INSGSM installation job) used by the

Global Clients must be changed to avoid inconsistencies which will result in network errors (see Appendix C).

G.41 Changes to the Registry are not Recognised Immediately

Although changes to the Windows Registry, made using GLREGED.EXE (see Chapter 7) are applied immediately, in general the effect on Global Servers and Global Clients are not recognised until the process is restarted.

The only commonly encountered exceptions to this rule are those parameters that affect the Tape controller, including the NoFilemark flag (see section 8.4.1.2).

Under rare circumstances, the various "Server parameters" for a Global Client will be re-read from the Registry. Note that this will only occur if the previous parameters were invalid and caused a "binding handle error" (see section C.1.3).

G.42 Copying Data while Global System Manager is running

This section describes some difficulties that may occur when attempting to import data into a running Global System Manager (Windows NT) system. Obviously, if the computer supports a diskette drive, data may be copied using \$F etc. via diskette. Similarly, if \$TAPE is supported on the computer/hardware configuration \$TAPE may be used to import data.

If Global System Manager is unable to access any suitable peripheral devices (i.e. diskette drive or tape drive) then data, encapsulated within Global System Manager volumes, may be imported using Windows NT utilities either directly (e.g. Windows Backup Manager etc.) or remotely (e.g. ftp etc.). Note that "native" Windows NT data files may be imported into Global System Manager using Global File Converters. This section explains the precautions that must be taken when transferring Integrated Data File DLV's (see sections 8.2.2 and 9.2.2), Integrated Data Files (see sections 8.2.2 and 9.2.2) and Discrete Data Files (see sections 8.2.1 and 9.2.1).

Note that unlike other, related configurations (e.g. Global System Manager (Unix)) virtual diskettes are NOT supported on Global System Manager (Windows NT).

G.42.1 Copying Integrated Data Files (DLV's and Domains)

By default (i.e. if the InactivityTimeout is disabled - see below), if data is copied from one Windows NT computer to another via an Integrated Data File (e.g. Windows NT file C:\GSM\GSM200.VOL), overwriting an existing Integrated Data File of the same size, or a different size, Global System Manager MUST be reloaded completely for the new volume to be recognised. If Global System Manager is not reloaded after the transfer, any attempt to access the new volume may result in data corruption.

If the file copy did not involve an overwrite of an IDF file of the same name and size, Global System Manager will not recognise the corresponding unit, without a reload.

Important note: This situation is very unlikely to occur in practise because, if the InactivityTimeout option is disabled, any attempt to overwrite an existing "in use" IDF volume (either domain or DLV) will fail with a Windows Sharing Violation.

However, if the InactivityTimeout value (see section 8.2.2.2) is set to a low nonzero value (e.g. 1 minute) it is possible to overwrite an existing Integrated Data File DLV or Domain by a new file of **exactly the same size** after N minutes of inactivity (i.e. after the InactivityTimeout has expired and the corresponding Windows file has been closed). The Global Server or Global Client will automatically re-open the file when is next accessed by a Global utility (e.g. \$F) or application.

If the new file is not the same size as the original file, Global System Manager will report a INVALID VOLUME error message.

The use of the InactivityTimeout in conjunction with the IDF controller makes it unnecessary to produce a Global System Manager (Windows NT) "virtual diskette controller" for the express purpose of "on-the-fly" data input.

G.42.2 Copying Discrete Data Files

By default (i.e. if the InactivityTimeout is disabled - see below), if data is copied from one Windows NT computer to another via a Discrete Data File (e.g. Windows NT file C:\GSM\10G3DATA.VOL), Global System Manager **MUST** be reloaded completely for the new sub-volume to be recognised. If the freshly imported sub-volume file does not overwrite a file of the same name, the corresponding sub-volume won't be recognised until Global System Manager is completely reloaded. However, if the new sub-volume does overwrite an existing file of the same name and size, the new data may **appear** to be immediately accessible. If Global System Manager is not reloaded after the transfer, any attempt to access the new volume may result in data corruption.

The Discrete Data File controller (i.e. DDF controller), within the GLOBAL.EXE process, establishes a table of Windows NT sub-volume files when Global System Manager is initiated. The DDF controller is unaware that a new file has been imported into the DDF directory until Global System Manager is restarted.

Important note: This situation is unlikely to occur in practise because, if the InactivityTimeout option is disabled, any attempt to overwrite an existing "in use" DDF volume will fail with a Windows Sharing Violation. However, the DDF controller routinely closes and re-open sub-volume files (the exact number of open sub-volume files depends on the Handles Registry parameter - see sections 8.2.1.2 and 9.2.1.2) so it may still be possible to overwrite a nrvvvvvv.SVL file even when the InactivityTimeout option is disabled or set to a high value.

However, if the InactivityTimeout value (see section 8.2.1.2) is set to a low nonzero value (e.g. 1 minute) it is possible to overwrite an existing Sub-Volume file by a new file of **exactly the same size** after N minutes of inactivity (i.e. after the InactivityTimeout has expired and the corresponding Windows file has been closed). The Global Server or Global Client will automatically re-open the file when is next accessed by a Global utility (e.g. \$F) or application.

The use of the `InactivityTimeout` in conjunction with the DDF controller makes it unnecessary to produce a Global System Manager (Windows NT) "virtual diskette controller" for the express purpose of "on-the-fly" data input.

To summarise these rules:

Copy data into	Action needed to ensure data consistency
Virtual diskette	Not supported;
DLV	Wait until the <code>InactivityTimeout</code> expires. The new DLV file must be exactly the same size as the existing file;
Integrated Data File	Wait until the <code>InactivityTimeout</code> expires. The new IDF file must be exactly the same size as the existing file;
Discrete Data File	Wait until the <code>InactivityTimeout</code> expires (or the DDF file is closed by the LRU Handle algorithm). The new DDF Sub-Volume file must be exactly the same size as the existing file. If a new Sub-Volume number is to be introduced into a Discrete Data File Domain, the general-purpose technique described in this section cannot be used. Instead, the specialised technique described in section G.32 must be employed.

Appendix H - Standard Configurations

Chapter 2 describes the installation of a simple Global System Manager (Windows NT) network. This appendix extends the techniques described in Chapter 2 to describe all the common, standard configurations.

Section G.33 describes a potentially useful non-standard configuration which allows "clusters" of Global Clients to use a private Shared SYSRES.

H.1 Installing on the Master Server

As explained in Chapter 2, the installation of Global System Manager (Windows NT) **MUST** always start with the installation of a Server-Client pair on the Master Server using the steps described below.

H.1.1 Master Server with simple Client

This option represents the most basic, and most useful, configuration on the Master Server.

1. Use the Setup utility (i.e. SETUP.EXE - see section 2.2) to install the Master Server "A" and a Global Client (e.g. 27) without a local DDF. This "BACNAT installation" can be achieved in a single invocation of SETUP by performing a Global Server installation (see section 2.2.3) followed by a Global Client installation (see section 2.2.4).

The Master Server installation option of Setup will extract a pre-configured Global Server IPL DLV (i.e. GL-A-IPL.DLV equivalent to unit a10) from the BACNAT media; and create an uninitialised Global Client IPL DLV (i.e. GL-IPL.DLV equivalent to unit 110);

2. When the BACNAT installation has completed, run the GLINSSRV.BAT batch file to install Global System Manager from BACRES, BEA etc. on the Master Server. **Important note:** This crucial second stage will initialise the previously empty GL-IPL.DLV file.

The Master Server can be initiated using any of the techniques described in sections 6.2 to run the GLSSTART.EXE utility (see section 6.5). The Global Client (on the same computer as the Master Server) can be initiated using any of the techniques described in sections 6.2 to run the GLOBAL.EXE utility (see section 6.3).

H.1.2 Master Server, Extra Global Server(s) with simple Client

The first simple variation on the base configuration described in section H.1.1 involves installing one, or more, Global Servers on the computer running the Master Server.

1. Use the Setup utility (i.e. SETUP.EXE - see section 2.2) to install the Master Global Server "A"; followed by one, or more, (data-only) Global Servers (e.g. "B", "C", "D" etc.); finally followed by the Global Client (e.g. 27) without a local DDF.

This "BACNAT installation" can be achieved in a single invocation of SETUP by performing the various Global Server installations (e.g. for Servers "A", "B", "C" etc. - see section 2.2.3) followed by the Global Client installation (see section 2.2.4).

The Master Server installation option of Setup will extract a pre-configured Global Server IPL DLV (i.e. GL-A-IPL.DLV equivalent to unit a10) from the BACNAT media; and create an uninitialised Global Client IPL DLV (i.e. GL-IPL.DLV equivalent to unit 110). The other (i.e. non-Master) Global Server installation options of Setup will extract the relevant pre-configured Global Server IPL DLV's (e.g. GL-B-IPL.DLV, GL-C-IPL.DLV etc.) from the BACNAT media;

2. When the BACNAT installation has completed, run the GLINSSRV.BAT batch file to install Global System Manager from BACRES, BEA etc. on the Master Server. **Important note:** This crucial second stage will initialise the previously empty GL-IPL.DLV file.

The Master Server and the various data-only Servers can be initiated using any of the techniques described in sections 6.2 to run the GLSSTART.EXE utility (see section 6.5). The Global Client (on the same computer as the Master Server) can be initiated using any of the techniques described in sections 6.2 to run the GLOBAL.EXE utility (see section 6.3).

The DDF domain associated with a data-only Global Server is not initialised for use with Global System Manager - the \$V utility (see section 4.10) must be used to initialise the domain x00 (see section 9.2.1.3). Contrast this with the DDF domain associated with the Master Server which is automatically initialised by the Global System Manager installation process.

H.1.3 Simple Master Server with Client (local DDF)

The second simple variation on the base configuration described in section H.1.1, although not particularly useful in its own right, does illustrate another possible option: A Global Client can be configured with a local, network-invisible DDF domain (normally addressed as unit 200). This configuration is installed by specifying a "local DDF" during the Global Client phase of the Setup dialogue (see section 2.2.4.5).

The local DDF domain associated with a Global Client (shared SYSRES) is not initialised for use with Global System Manager - the \$V utility (see section 4.10) must be used to initialise the domain 200 (see section 8.2.1.3).

H.1.4 Master Server, Extra Global Servers(s), Client (local DDF)

This slightly esoteric Master Server configuration is merely a combination of the extensions to the simple installation described in sections H.1.2 and H.1.3.

H.1.5 Simple Master Server with Client (local SYSRES)

Although a Global Client with a local SYSRES is allowed for other computers (see section 2.2.4.4) the Global Client installed on the Master Server **MUST** be installed with a shared SYSRES (so that the subsequent Global System Manager installation initialises the GL-IPL.DLV volume for this, and other, Global Clients). Consequently, **THIS OPTION IS NOT ALLOWED AND IS ONLY DOCUMENTED FOR COMPLETENESS.**

H.2 Installing Extra Global Clients (without a local SYSRES)

Once a Server-Client pair have been successfully installed on the Master Server using the following obligatory steps (see section H.1):

- Install Global Server BACNAT components using SETUP;
- Install Global Client BACNAT components using SETUP;
- Install Global System Manager on Master SYSRES, initialising the Global Client IPL DLV (i.e. GL-IPL.DLV) in the process.

It is then possible to install the Global Client software on other computers on the network.

Note that all Global Clients without a local SYSRES will share the Master SYSRES accessed via the Master Server. The unit address of the Master SYSRES is normally A01.

To facilitate the network installations it is often convenient to copy the contents of the BACNAT diskettes to an "install directory" on a Windows NT file-server (see section 2.2.2.2).

H.2.1 Simple Extra Client (no local DDF, no local SYSRES)

Installing a Global Client on a computer other than the one hosting the Master Server is achieved using the following steps:

1. Use the Setup utility (i.e. SETUP.EXE - see section 2.2) to install a Global Client without either a local DDF (see section 2.2.4.5) or a local SYSRES (see section 2.2.4.4);
2. Once SETUP has completed, the GL-IPL.DLV file created during the Master Server installation (see section H.1.1) **MUST** be copied to the Global directory on the local workstation (i.e. a shared GL-IPL.DLV volume is NOT allowed - see section G.37).

These steps should be repeated for all the Global Clients (that are not configured with a local SYSRES) on the network.

The Global Client can be initiated using any of the techniques described in sections 6.2 to run the GLOBAL.EXE utility (see section 6.3).

H.2.2 Simple Extra Client (local DDF, no local SYSRES)

This simple variation of the standard Global Client configuration described in section H.2.1 allows a Global Client to be configured with a local, network-invisible DDF domain (normally addressed as unit 200). This configuration is installed by specifying a "local DDF" during the Global Client phase of the Setup dialogue (see section 2.2.4.5).

The local DDF domain associated with a Global Client (shared SYSRES) is not initialised for use with Global System Manager - the \$V utility (see section 4.10) must be used to initialise the domain 200 (see section 8.2.1.3). Contrast this with the DDF domain associated with a Global Client with a local SYSRES (see section H.3) which is automatically initialised by the Global System Manager installation process.

H.3 Installing Extra Global Clients (with a local SYSRES)

Although the installation of a Global Client with a local SYSRES may appear to be similar to the installation of a Global Client without a local SYSRES, the two configurations are fundamentally different.

Installing a Global Client with a local SYSRES is achieved using the following steps:

1. Use the Setup utility (i.e. SETUP.EXE - see section 2.2) to install a Global Client specifying a local SYSRES (see section 2.2.4.4);
2. Once SETUP has completed the BACNAT installation, run the GLINSLI.BAT batch file to install Global System Manager from BACRES, BEA etc. to the local SYSRES.

The Global Client can be initiated using any of the techniques described in sections 6.2 to run the GLOBAL.EXE utility (see section 6.3). Note that the command line argument for the GLOBAL.EXE utility is the name of the local DDF domain (that includes the SYSRES sub-volume (e.g. C:\GSM\GSM200) rather than the name of the SYSIPL DLV (i.e. C:\GSM\GL-IPL.DLV). Consequently, there is no requirement to copy the Master Server GL-IPL.DLV file to the local computer if the Global Server has been installed with a local SYSRES.

H.4 Installing Extra Global Servers

Additional Global Servers can be installed with or without a Global Client running on the same computer:

1. Use the Setup utility (i.e. SETUP.EXE - see section 2.2) to install one, or more, (data-only) Global Servers (e.g. "B", "C", "D" etc.);
2. No Global System Manager installation is required (i.e. the BACRES, BEA etc. diskettes are not required).

The DDF domain associated with a data-only Global Server is not initialised for use with Global System Manager - the \$V utility (see section 4.10) must be used to initialise the domain x00 (see section 9.2.1.3). Contrast this with the DDF domain associated with the Master Server which is automatically initialised by the Global System Manager installation process.

Important note: If a Global Server is installed after the installation of a Global Client(s), the Network parameters for the new Global Server (i.e. Node-id, Network Protocol, Network Address and Endpoint) must be defined in the Registry (see section 8.6.1.2.2) for all computers hosting a Global Client that will connect to the new Global Server.

H.5 Summary of Standard Installations

This section lists some of the characteristics of the Global Servers and Global Clients installed using the various options described above:

Appendix H - Standard Configurations

Description command(s)	IPL Volume	Windows
Master Server /INDIVIDUAL=A	GL-A-IPL.DLV	GLSSTART GLSSTART /ALL
Global Server (data-only) /INDIVIDUAL=x	GL-x-IPL.DLV	GLSSTART GLSSTART /ALL
Global Client (no local DDF) IPL.DLV	GL-IPL.DLV	GLOBAL GL-
Global Client (local DDF only) IPL.DLV	GL-IPL.DLV	GLOBAL GL-
Global Client (local SYSRES)	GSM200	GLOBAL GSM200

The standard unit addresses for the IPL and SYSRES volumes for the various types of Global Clients are as follows:

Volume	Shared SYSRES	Local SYSRES
SYSIPL (local SYSRES)	110	None (loads from the
SYSRES	A01	201

The Global configuration file for a Global Client is on the SYSIPL volume (for a Global Client with a shared SYSRES) or the SYSRES volume (for a Global Client with a local SYSRES).

The Global configuration file for a Global Server is always on the Server IPL volume (i.e. unit a10 for Server "A", b10 for Server "B" etc.).

Appendix I - SVC-70 Interface

Global System Manager (Windows NT) contains a special interface, SVC 70, that may be used by application programmers to execute Windows programs from within Global System Manager.

The call to SVC 70 is coded as follows:

```
SVC 70 USING buff result [extn]
```

where: buff is a character buffer containing the command string **which must be terminated by a byte of binary-zero**;

result is a PIC 9(2) COMP variable which reflects the result of the Windows call that executes the command. Note that this is NOT the result of the command;

extn is an optional extension, coded as a group item consisting of the following variables:

```
01  EX
    02  EXSHOW      PIC 9(2) COMP * INITIAL SHOW STATE
    02  EXWAIT      PIC 9(2) COMP * WAIT OPTION
    02  EXEXIT      PIC 9(4) COMP * EXIT CODE
```

The EXSHOW flag is used to set the initial visible state of the Windows command. The following values are allowed:

```
0  Normal window
1  Maximised window
2  Minimised window
3  Minimised window in background
```

The EXWAIT flag indicates whether SVC 70 should wait until the Windows command completes. The following values are allowed:

```
0  Return control immediately
1  Wait for the Windows command to finish
```

The EXEXIT field contains the Exit Code from the Windows command if the "Wait for command to finish" option (see above) has been chosen.

Important note: This interface is significantly different from the superficially similar SVC-70 interface available on Global System Manager (Unix) configurations.

If SVC-70 returns an exception, \$\$COND must be tested to determine the result:

```
0  Success. The Windows call to execute the command completed
    successfully. The result of the command itself is unknown;
1  Wrong number of parameters;
2  Error returned from the Windows call to execute the command
    (e.g. file not found, insufficient resources etc.);
```

- 3 Unable to get exit code;
- 4 The command string was empty or too long;
- 5 The show window parameter was incorrect.

The 2 parameter call to SVC 70 should be coded as follows:

```

*
* Establish the Windows command string in buff
*
SVC 70 USING buff result
ON NO EXCEPTION
*
* The command has been initiated successfully
*
ELSE
    IF $$COND = 1
        *
        * Wrong number of parameters
        *
        END
    IF $$COND = 2
        *
        * Command could not be initiated
        *
        END
    IF $$COND = 3
        *
        * Unknown error
        *
        END
    IF $$COND = 4
        *
        * The Windows command string was too long
        *
        END
END

```

The 3 parameter call to SVC 70 should be coded as follows:

```

*
* Establish the Windows command string in buff
* Establish the Show option in EXSHOW
* Establish the Wait option in EXWAIT
*
SVC 70 USING buff result extn
ON NO EXCEPTION
*
* The command has been initiated successfully
*
    IF EXWAIT = 1          * IF WAITED FOR COMPLETE
        IF EXEXIT NOT ZERO * ERROR FROM WINDOWS PROG
        *
        * The Windows program has returned an error
        *
        END
    END
ELSE
    IF $$COND = 1

```

```
*
* Wrong number of parameters
*
  END
  IF $$COND = 2
*
* Command could not be initiated
*
  END
  IF $$COND = 3
*
* Unable to get exit code
*
  END
  IF $$COND = 4
*
* The Windows command string was too long
*
  END
  IF $$COND = 5
*
* The show parameter was incorrect
*
  END
END
```

Appendix J - Server Network Parameters Worksheet

This table should be completed during the Server installation phase of the SETUP installation (see section 2.2.3.4). It can be used subsequently during the Client installation(s) when the various Server Network Parameters will be required (see section 2.2.4.9).

Server	Protocol Sequence	Network Address	Endpoint
A			
B			
C			
D			
E			
F			
G			
H			
I			
J			
K			
L			
M			
N			
O			
P			
Q			
R			
S			
T			
U			
V			
W			
X			
Y			
Z			

Appendix K – GLOBAL.INI File Options

This appendix describes the optional Global Client initialisation file, GLOBAL.INI. This file, which must be in the Windows directory (e.g. C:\WINDOWS), conforms to standard Windows INI file format (i.e. it is split into sections each containing a group of related settings). Users of the Global Windows Workstation, who have examined the GSMWIN.INI file, will be familiar with the format of the GLOBAL.INI file.

K.1 GLOBAL.INI File Format

The section and settings are set up in the following way:

```
[section name]
keyname=value
```

The section name must be enclosed by square-brackets. The left square-bracket must be in the first column of the file.

The keyname is the name of a setting which can be formed by any combination of letters (case insensitive) and digits and must be followed immediately by an equal sign (i.e. "="). The value of a setting can be a string or an integer.

A comment line is denoted by a semicolon character which must be at the beginning of a line.

K.2 GLOBAL.INI Sections

Only one section in the GLOBAL.INI file is recognised:

```
[programs]           Specifies the associations between a number
                      of Global System Manager programs and Windows
                      applications;
```

Important note: The following sections, that are allowed in the Global Windows Workstation GSMWIN.INI file, are not recognised in the Global System Manager (Windows NT) GLOBAL.INI file:

```
[device]           In the GSMWIN.INI file, this section specifies the
                      interface to be used to connect to the host
                      system. The "device" concept is meaningless in the
                      context of the Global System Manager (Windows NT)
                      architecture;
```

```
[colour]           In the GSMWIN.INI file, this section specifies the
                      18 Speedbase and up to 32 Global System Manager
                      colour combination mappings and the various frame
                      background, text and highlighted colours. For
                      Global System Manager (Windows NT) configurations,
                      these parameters are held in the Registry (see
                      Appendix F);
```

```
[filetransfer]     In the GSMWIN.INI file, this section
                      specifies various parameters used during file
                      transfer. The "file transfer" concept is
                      meaningless in the context of the Global System
                      Manager (Windows NT) architecture;
```

[miscellaneous] In the GSMWIN.INI file, this section specifies other information (e.g. the refresh timeout, initial state of toolbar, etc.). For Global System Manager (Windows NT) configurations, these parameters are held in the Registry (see Appendix F).

K.3 GLOBAL.INI [programs] Section

This section defines the Global System Manager program to Windows application associations. The associations defined allow Windows applications to be started via the Program menu entry in the Functions menu (or the equivalent button on the toolbar).

Each setting in this section is specified as follows:

```
programn=global_program_name,windows_application_name
```

where n is a unique number in the range 1 to 999, global_program_name is a string of up to 8 characters (the empty string is a special case) and windows_application_name is a Windows program name including a pathname and parameter string if required. The Windows program name must be specified without an extension which is assumed to be .EXE. The .EXE file extension will be appended automatically. If the Global program name is an empty string the corresponding Windows application will be associated with any Global application not included in the [programs] section. For example:

```
[programs]
program1= GL410A,USERPROG\GL410A
program2= GL420A,\GSM\USERPROG\GL420A
program3= GL420A,\WINDOWS\notepad
program5= ,C:\WINDOWS\notepad GLOBAL.INI
```

In this example, if the Custom Exec Button (see section 5.3.7) is clicked when Speedbase frame GL410A is executing then the user written program GL410A.EXE will be initiated. If Speedbase frame GL420A is executing then a Dialogue Box will be displayed with the two options in a list box. For all other Global programs the Windows NOTEPAD text editor will be run which will automatically load the GLOBAL.INI file from the Windows system directory.

A special parameter string "[]" is used to represent a programmable parameter string. This string must be established by the associated Global program before the Windows application is initiated. See section M.2 for further details.

Note that more than one Windows application can be associated with a single Global program. In this case the user can select the required Windows application from a drop-down list.

Appendix L - Graph Template File Structure

This appendix describes how to add, or modify, a record in the graphics conversion template file, GSMCONV.TLT. Note that the GSMCRTLT.EXE utility, supplied with Global System Manager (Windows NT) can be used to create a prototype template file.

L.1 Template file structure

The template file is a free format text file divided into records which define how a particular screen image will be processed by the Graph Viewer sub-system. Each record is of the following structure:

```
* Comment line (any line starting with a "*" is a comment)
* The "*" MUST appear in the first column.

program/frame name:[Speedbase frame title]
SCREENID      x y "xxxxx..."
TEMPLATE      "xxxx..." (up to 30 characters)
VERSION       "xxx"
TYPE          2DPIE | 3DPIE | 2DBAR | 3DBAR | LINES
STYLE         n
TITLE         x y l | "xxxxx..." (up to 80 characters)
LOCATION        l t w h
SETS          n
POINTS        n
DATASET       n x y l [f] [t]
LEGEND        n "xxxxx..." (up to 30 characters)
COLOUR        DEFAULT | colour_list
LABEL         x1 y1 l1 ["xxx."] [x2 y2 l2] ["xxx."] [m]
GRAPHTITLE    x y l | "xxxxx..." (up to 80 characters)
```

L.1.1 Program/Frame_name

The program/frame_name is used as a label to identify the record in the template file. The conversion program, GSMCONV.EXE, searches for the label which corresponds to the program/frame name that is currently being executed by Global System Manager. Some Speedbase frames produce more than one screen which could be converted so an optional additional string is used to identify the frame. This identifier is the frame title which is written as the second line in the SCREEN.TXT intermediate file. If there is no frame title then "NO TITLE" appears on this line. Note that this line is blank if the screen image is dumped from a non-Speedbase program, and the SCREENID option (see section L.1.2) needs to be used to differentiate between screens. If the appropriate label is not found then the following error message will be displayed:

```
No template exists for this screen
```

If this error does occur then a new record must be added as described in section L.2.

L.1.2 SCREENID x y string

The SCREENID string provides a method for the conversion program to identify the screen where the program/frame name does not uniquely identify the screen's contents. If the string is found at the specified co-ordinates then this conversion template will be used.

L.1.3 TEMPLATE string

The **TEMPLATE** string provides a method for the user to select a particular template from a set of multiple templates defined for a single program. When the conversion program detects multiple templates it builds a list of the **TEMPLATE** strings which is presented to the user in a Windows drop-down list box. The user is then allowed to choose which template should be used for the conversion, so the **TEMPLATE** string should be made sufficiently descriptive to help the user make the choice. This technique is useful to view different sets of data without having to edit the template file. For example, if there are three data sets then it is possible to set up three templates to view each combination of two data sets. Note that the **SCREENID** keyword must be included in each multiple template record. Note also there is a maximum of 20 templates for a single program.

L.1.4 **VERSION** string

The 3 character version string indicates the version of the intermediate "_graph" file. There are three valid version strings:

"1.0"	Original format;
"1.1"	Original format plus LOCATION information;
"1.2"	Original format plus LOCATION and GRAPHTITLE information.

Note that the graph viewer will only interpret version "1.0", "1.1" or "1.2" files.

L.1.5 **TYPE** string

The **TYPE** must be set to one of the five graph types supported by the graphics program (i.e. one of 2DPIE, 3DPIE, 2DBAR, 3DBAR and LINES). Note that negative values can be produced by the conversion program which have no significance on pie charts. Please ensure that only positive data is passed when using pie charts.

L.1.6 **STYLE** number

The graph type can be modified by using the style parameter. Valid style values differ according to the graph type as shown in the following table:

TYPE	Valid style values	Result
2DPIE	0	Lines join labels to pie chart
3DPIE	0	Lines join labels to pie chart
2DBAR	0	Vertical bars
	1	Horizontal bars
	2	Vertical stacked
	3	Horizontal stacked
3DBAR	0	Vertical bars
	1	Horizontal bars
	2	Vertical stacked
	3	Horizontal stacked
	6	Vertical Z-clustered
	7	Horizontal Z-clustered
LINES	0	Lines
	1	Symbols

2	Sticks
3	Sticks and symbols
4	Lines
5	Lines and symbols

Note that the TYPE and STYLE attributes set the initial presentation of the data, but this is easily changed dynamically by the graph viewer.

L.1.7 TITLE x y l | string

The title is appended to "Global Graph Viewer" to form the graph program's caption. The title is specified either as a fixed string of up to 80 characters, or it can be extracted from the screen information by specifying its start location (x, y) and length l.

Note that the TITLE directive can be overridden by the escape sequence described in section M.3.

L.1.8 LOCATION l t w h

These values specify the initial window coordinates for the Global graph viewer. The parameters specify the following:

- l = Top left corner X coordinate;
- t = Top left corner Y coordinate;
- w = Width of window;
- h = Height of window.

where all quantities are expressed in pixels.

Note that it is safest to set LOCATION values specifying a window which will appear on VGA screens (i.e. within a 640 by 480 grid) to ensure compatibility on all systems.

Important note: The VERSION string must be set to "1.1", or later, otherwise the LOCATION parameters will be ignored by the conversion program.

L.1.9 SETS number

This value defines the number of data sets to be set up in the data files. In effect this is the number of columns of figures to be processed by the conversion program. Note that the conversion program assumes that all data sets are vertical columns of figures. Note that for pie chart graph types this value must be set to 1.

L.1.10 POINTS number

This values defines the maximum number of points in each data set (i.e. the number of figures to process in each column). This value can be reduced automatically by specifying a terminator in the DATASET entry (see section L.1.11). Note that each data set is assumed to contain the same number of points.

L.1.11 DATASET n x y l [f] [t]

The conversion program needs to know where each column of figures starts, at (x, y), and the maximum length of the figures in the column, l. The data set number, n, should lie in the range 1 to SETS. The field start position and length parameters must be specified accurately to encompass the entire field, otherwise corrupt data may be sent to the graph viewer program. The optional format modifier, f,

is used to assist the conversion program with the determination of negative numbers. There are two valid values for this field, "<" and ">", which mean bracketed numbers are treated as negative and positive respectively. The optional terminator, t, allows the number of POINTS to be modified automatically for variable length DATASET's. The only valid value for this field is " ", which means the conversion program will modify the POINTS value on detecting a blank field. Note that only one DATASET can have a terminator field (this is known as the master DATASET).

L.1.12 LEGEND string

The legend defines the label for each data set, which can be up to 30 characters in length.

L.1.13 COLOUR DEFAULT | colour_list

The number of colours required differs according to the graph type. For pie charts each sector requires a colour (i.e. POINTS colours must be defined in the data file) and for the other graph types each data set requires a colour (i.e. SETS colours must be defined in the data file). The colour is specified as a number in the range 0 to 15. DEFAULT uses the data set number for non-pie charts; and cycles from 1 to POINTS for pie charts. The colour_list allows the user to choose which colours are required, again cycling through them if insufficient are specified.

L.1.14 LABEL x1 y1 l1 [string] [x2 y2 l2] [string] [m]

Each point on the graph requires a label (e.g. Jan, Feb, etc. if the points represent a month). Up to POINTS number of labels will be generated from a column of data starting at (x1, y1) each with a length of (l1) characters. The basic label can be extended by concatenating a fixed string, another variable label and another fixed string after that. This facility allows labels to be built from different parts of the screen. Note that if the additional variable label is used then a fixed string must be inserted between them and this string must contain at least one character.

The modifier is used to convert a numeric date into a word date (e.g. 01/94 to Jan 1994) according to the following table:

Modifier	Numeric date	Word date
MMM/YY	01/94	Jan/94
MMM/YYYY	02 94	Feb 1994
MMMM/YY	03.94	March.94
MMMM/YYYY	04-94	April-1994

Note that the month and date separator can be a "/", " ", ".", or "-". The maximum label length is 30 characters (i.e. the combined length of all fields must be 30, or less).

L.1.15 GRAPHTITLE x y l | string

The GRAPHTITLE is used by "Global Graph Viewer" to establish a title for the Graph. The GRAPHTITLE string appears above the graph (and also in the optional print report). The GRAPHTITLE is specified either as a fixed string of up to 80 characters, or it can be extracted from the screen information by specifying its start location (x, y) and length l.

Important note: the VERSION string must be set to "1.2", or later, otherwise the GRAPHTITLE parameters will be ignored by the conversion program.

L.2 Creating a new template record

The first step in producing a template record for a new screen is to select the "Graph" option, either from the "Functions" menu or via the associated toolbar button, when the chosen screen is reached. This will generate a text file, SCREEN.TXT, in the GRAPHS sub-directory from which the template record parameters can be derived. For example, the following information is dumped in the SCREEN.TXT file from the Global 3000 General Ledger - Account Enquiries - Periodic Analysis screen:

```
GL220
Periodic Analysis Account A1000 (Sales - Projectors )

Period          Periodic Movement   Closing Balance
Units          End Date  Amount    Unit      Amount
1             31/01/93  105131.64C          105131.64C
2             28/02/93  90990.40C          196122.04C
3             31/03/93  10519.88C          206641.92C
4             30/04/93
5             31/05/93
6             30/06/93
7             31/07/93
8             31/08/93
9             30/09/93
10            31/10/93
11            30/11/93
12            31/12/93
```

The first line in the text file gives the program/frame name, GL220, so this must be used as the label in the template file (i.e. GL220: indicates the beginning of the record which deals with this screen). The GL220 frame can also generate other screens so the frame title "Periodic Analysis" can be used.

For this example there are two columns of figures which can be treated as data sets, the periodic movement and closing balance values, so the SETS value must be 2. Note that this restricts our choice of graph type to a 2DBAR, 3DBAR or LINES.

Each column represents up to twelve months worth of values, so the POINTS value must be 12.

Two DATASET statements are required (the SETS value is 2). The parameters can be determined by using the a Windows text editor to "edit" the SCREEN.TXT file. This editor displays the current cursor position (as a (y, x) co-ordinate) at the bottom right-hand corner of the screen, which equates to the x and y position parameters required by DATASET. The values of these parameters can be determined by moving the cursor to the start position and reading the supplied co-ordinates. The field length can be determined in a similar way by placing the cursor on the last character in the field, taking the x co-ordinate value and using the formula:

$$l = \text{"last x-coordinate"} - \text{"start x-coordinate"} + 1$$

Note that there are only three values in each column so this is a case where a terminator could be used.

Each column will usually have a heading which is suitable for use as a legend. Note that the LEGEND's are numbered in the same way as DATASET's to provide an association.

The LABEL parameters can be determined using a Windows editor in a similar way as described for the DATASET parameters.

The completed record for the GL220 screen is as follows:

```

GL220:PERIODIC ANALYSIS
VERSION "1.0"
TYPE 3DBAR
STYLE 6
TITLE "General Ledger"
SETS 2
POINTS 12
DATASET 1 24 7 12 " "
DATASET 2 52 7 12
LEGEND 1 "Periodic movement"
LEGEND 2 "Closing balance"
COLOUR DEFAULT
LABEL 11 7 8

```

Note that DATASET parameters seem to specify too large a field. However, this is required to ensure that all possible values in the columns will be converted correctly. Also note that the final "C" is not included in the field and so is taken to be positive (a technique which is useful for producing positive data for pie charts). If the DATASET length is increased to 13 (i.e. to include the "C" then each value would be taken to be negative).

The labels produced are of the form "dd/mm/yy" (i.e. identical to that displayed on the screen). If a "word date" is required then the LABEL line should be modified as follows:

```
LABEL 14 7 2 " " 17 7 2 MMM/YYYY
```

Note that even though the date appears in a recognised form for the modifier it still has to be constructed from two variable labels.

L.3 Modifying a template record

A template record will usually be modified to add/remove DATASET entries, which also requires the addition/removal of LEGEND entries. If the number of DATASET entries is modified then the SETS value must be updated to the appropriate value. For example, the GL220 record defined above could be modified so that only the "Periodic movement" data was converted by removing the DATASET 2 and LEGEND 2 lines and reducing the SETS value to 1.

L.4 Error and warning messages

The conversion program reports problems which lie in two general classes. An error is fatal and means that the conversion cannot continue (i.e. the graphics data file will not be created and the graph viewer will not be run). A warning is not fatal and the user is

given a choice of whether to continue or abandon the conversion. Warnings can be ignored but it is advisable to correct the mistake in the template file so that the warning is not generated again.

L.4.1 Error messages

The following error messages can be generated whilst processing the template file.

No template exists for this screen

The program/frame name label for the current screen cannot be found in the template file. Creating a new template record, as described in section L.2, solves this problem.

Invalid TYPE

The TYPE specified is not one of the five allowed. Amend the template file to use one of the five types listed in section L.1.5.

Invalid STYLE

The STYLE specified is not valid for use with the specified TYPE. Refer to the table in section L.1.6 and set one of the valid STYLE values.

Too few legends

Each DATASET requires a LEGEND. Increase the number of LEGEND statements to match the SETS value.

Duplicate data sets specified

Each DATASET must have a unique number in the range 1 to SETS. Either remove the duplicate DATASET or renumber it.

No template with the correct SCREENID exists for the screen

Several templates have been found for the particular program/frame but the SCREENID field in each template does not match. Either add another template with a valid SCREENID or modify an existing one.

More than one master set specified

The terminator field must be added to one DATASET only. Remove the extra terminator fields so that only one DATASET is modified.

Only blank fields exist in master set specified

The first field encountered in the master set is blank, which would result in 0 POINT's of data. This could be caused by setting the wrong start position for the DATASET.

Pie chart needs more than one data value

There is insufficient data to produce a graph.

Bar chart needs more than one data value

There is insufficient data to produce a graph.

This program will only run with version 1.0/1.1/1.2

The graph viewer has detected the VERSION string is not "1.0", "1.1" or "1.2". Change the VERSION string in the appropriate template to a supported value.

The LOCATION coordinates exceed screen bounds

The graph viewer has detected the initial window coordinates requested by the LOCATION entry in the template will cause all, or part, of the window to be "clipped" because the physical size of the screen is too

small to contain it. Modify the LOCATION values such that the window will appear in full on the screen. This problem could occur if a template is developed on a system with a larger screen than the target system.

TEMPLATE entry required

There are two or more templates for the current program/frame which cannot be distinguished and do not have a TEMPLATE entry. The GSMCONV.TLT must be edited either to remove the extra templates or to add TEMPLATE entries to them.

L.4.2 Warning messages

The following warning messages can be generated whilst processing the template file.

DATASET number out of range

The DATASET number must be in the range 1 to the SETS value. DATASET numbers that are out of range will be ignored if you choose to continue with the conversion.

COLOUR number out of range

The COLOUR number must be in the range 0 to 15.

VERSION string too long

The string specified in this statement is greater than maximum permissible string length for the particular field in the graph data file. The string will be truncated to the appropriate length if you choose to continue with the conversion.

TITLE string too long

The string specified in this statement is greater than maximum permissible string length for the particular field in the graph data file. The string will be truncated to the appropriate length if you choose to continue with the conversion.

GRAPHTITLE string too long

The string specified in this statement is greater than maximum permissible string length for the particular field in the graph data file. The string will be truncated to the appropriate length if you choose to continue with the conversion.

LEGEND too long

The string specified in this statement is greater than maximum permissible string length for the particular field in the graph data file. The string will be truncated to the appropriate length if you choose to continue with the conversion.

LABEL too long

The string length parameter is greater than 30. The string will be truncated if you choose to continue with the conversion.

Too many colours

The number of colours specified exceeds the SETS value. The extra values will be ignored if you choose to continue with the conversion.

Too many legends

The number of legends specified exceeds the SETS value. The extra values will be ignored if you choose to continue with the conversion.

Appendix M – GUI Program Control

This appendix describes those functions of the Global System Manager (Windows NT) Graphical User Interface (GUI) that can be controlled from a Global Cobol or Global Speedbase program. The interface is via a series of special Escape Sequences:

Escape sequence	Function
1B 73 string 0D	Initiate a Windows program
1B 74 30 string 0D	Set program function parameter
1B 74 40 string 0D	Set graph function title string
1B 75 xx yy xx' yy' dimensions	Specify End-User System Request window dimensions

M.1 Initiate a Windows program

A Windows program can be initiated by sending the following sequence to the GUI screen controller:

```
1B 73 string 0D
```

where string is the Windows program name and any parameter(s) it requires. The following program fragment illustrates how the Windows NOTEPAD editor can be initiated to operate on the GLOBAL.INI file from a Global Cobol program:

```
DATA DIVISION
*
77  WINPROG  PIC X(?)
   VALUE    #1B27      * Bypass on
   VALUE    #1B73      * Initiate program
*
* Program and parameter:
*
   VALUE    "C:\WINDOWS\notepad global.ini"
   VALUE    #0D
   VALUE    #1B1B      * Bypass off
*
PROCEDURE DIVISION
*
DISPLAY WINPROG SAMELINE * Send sequence to GUI
*
ENDPROG
```

The SVC-70 interface can also be used to initiate a Windows application from a Global Cobol or Global Speedbase program (see Appendix I for a complete description of SVC-70).

M.2 Set Program Function Parameter

The Program Function allows a Windows program to be initiated by a single click on its toolbar icon (see section 5.3.7). The program names are configured by a set of associations in the [programs] section of the GLOBAL.INI file (see Appendix K).

A special parameter "[]" can be set up in these entries (instead of a Windows program name - see section K.3) which will be replaced by the programmable parameter using the following sequence:

```
1B 74 30 string 0D
```

where string is a Windows program name and any optional parameters.

M.3 Set Graph Function Title String

The Graph Viewer title is normally set up by the TITLE entry in the conversion template file (see section L.1.7). This can be either a fixed string or a string obtained by reading specified locations on the screen. If neither of these methods is sufficiently flexible then the title can be set by program control using the following sequence:

```
1B 74 40 string 0D
```

where string is the required graph title. Note that the TITLE parameter is still required in the template record (see section L.1.7) but this user-defined string will override any such entry. For this reason it is imperative that the title string is sent at the start of a program or frame in order for it to be effective. Note that the title string is cleared when the current frame is closed.

M.4 Specify End-User System Request Window Dimensions

By default, a full 80 * 24 window is created when an End-User System Request is invoked by a call to the CMND\$ routine. It is possible for the System Request to specify the position and size of the window by displaying the following sequence:

```
1B 75 xx yy xx' yy'
```

where:

```
xx   X co-ordinate of the top left position of the window
yy   Y co-ordinate of the top left position of the window
xx'  X co-ordinate of the bottom right position of the window
yy'  Y co-ordinate of the bottom right position of the window
```

The top left position of the screen (i.e. Cobol co-ordinates (1,1) is given by xx = 0x20; yy = 0x20.

The GUI-specific sequence must be surrounded by the "by-pass on for 6 characters" sequence (i.e. 1B76) or the "by-pass on/by-pass off" sequence-pair (i.e. 1B27 and 1B1B).

Important note: The above escape sequence MUST be the first DISPLAY statement (or SVC 25 call) issued by the System Request. This escape sequence must also precede any ACCEPT statements in the System Request.

Appendix N - System Requests

A number of System Requests are inappropriate or function in a restricted manner when used with the GUI sub-system. The following table is a copy of the "System Requests" table in Chapter 4 of the Global System Manager Manual:

<SYSREQ>	Effect	Notes
1-9	Switch to the indicated concurrent partition. Equivalent to 1, 2, 3, 4 on the Toolbar and the Partition N entries in the "Window" menu.	
0	This System Request has no effect when used with the GUI sub-system.	
+	Switch to next higher concurrent partition. Equivalent to <RIGHT-ARROW> on the Toolbar and the Next Partition entry in the "Window" menu. For example, <SYSREQ> + in P1 will switch to P2.	
-	Switch to next lower concurrent partition. Equivalent to <LEFT-ARROW> on the Toolbar and the Previous Partition entry in the "Window" menu. For example, <SYSREQ> - in P2 will switch to P1.	
=	Switch to previous concurrent partition.	
.	Not supported on GSM (Windows) (i.e. <SYSREQ> . is ignored). DO NOT USE.	
<CR>	Equivalent to <ESCAPE>.	
<SPACE>	Display system request pop-up menu.	1
A	This System Request is not appropriate on GSM (Windows).	3
B	Used to establish key translation.	1,2
C	Invokes the calculator facility. Note that several features of the calculator are not available on GSM (Windows). The "w" command is not supported. The facility to read numbers from the screen is not supported.	1,2

Appendix N - System Requests

D	Invokes the calendar facility. Note that some features of the calendar are not available on GSM (Windows). The <F1> feature is not supported.	1,2
E	Invokes an end-user system request.	1,2
F	Activates a programmable function (0-9, A-Z).	
G	Equivalent to <CTRL G>.	
H	Invokes the Help facility.	1,2
I	Amends the unit assignment table.	1,2
J	Jot telephone message.	1,2
K	Used to set up the programmable functions.	1,2
L	Not supported on GSM (Windows).	3
M	Causes a temporary status line to be displayed on screens which lack a permanent one, so that you can check which partition you are in. Consequently, this System Request will have no effect when used with GUI sub-system (which includes a permanent status line).	
N	Read mail system request.	1,2
O	This System Request is not appropriate on GSM (Windows).	3
P	Prints current screen contents to unit \$PR.	1,2
Q	This System Request is not appropriate on GSM (Windows).	3
R	Not supported on GSM (Windows).	3
S	This System Request is not appropriate on GSM (Windows).	3

T	Talk to another operator system request. Important note: For Global System Manager V8.1 the functionality of <SYSREQ> T has changed. For versions of Global System Manager earlier than V8.1, <SYSREQ> T was the "Display current tasks" system request (see <SYSREQ> ?).	1,2
U	Equivalent to <CTRL U>.	
V	Not supported on GSM (Windows).	3
W	The break function - interrupts running program. Equivalent to <CTRL W>.	1
X	This System Request is not appropriate on GSM (Windows).	3
Y	List operator id's and full names.	1,2
Z	Blanks message area/removes message line display.	
"	This System Request is not appropriate on GSM (Windows).	3
*	This System Request is not appropriate on GSM (Windows).	3
?	Display current tasks.	1,2
:	Return diskette unit assignment.	1

Note-1 These system requests temporarily stop the program running in that partition.

Note-2 These system requests may be selected from the pop-up menu displayed by <SYSREQ> <SPACE>.

Note-3 This system request is not available on GSM (Windows).