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Configuration options for the HCL-eXceed/W PC X11 server

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Abstract

The X Window System, Version 11 (usually referred to as X11 or X11 Windows) is a hardware and operating system independent graphics environment developed by the Massachussetts Institute of Technology. X11 is particularly effective when it is used over a network (such as BMRnet) because it allows applications running on different host computers on the network to be accessed locally even if the hosts concerned are of different types and use widely different operating systems. Both the ER Mapper image processing package and ArcInfo Rev. 6 operate under X11 and it is therefore possible to network these applications throughout BMR using X11.

There are currently a number of software packages available for IBM-compatible PCs which effectively turn these machines into "smart" X11 terminals. Chopra (1991a) has reviewed three of these X11 servers and has concluded that one stands out as being best for BMR's applications. This product, HCL-eXceed/W provides the kind of save-under and restore-from-icon functionality that is needed in order to painlessly run UNIX applications such as ER Mapper and ArcInfo Rev. 6 on remote PC workstations.

The installation procedures and configuration options for HCL-eXceed/W are however quite complicated. This is partly because of the advanced features HCL-eXceed/W supports and partly because its configuration procedures are not always as intuitive as they might be. These shortcomings should be improved in future releases of HCL-eXceed/W (the current version is 1.0) but in the meantime, they can be circumvented by following the instructions set out in this Record.

Introduction

Access to BMR's major information technology systems over the corporate Ethernet network (BMRnet) is becoming an important issue. Network users need access to much if not all of the functionality that is provided to users working on the principal workstations associated with each system (Chopra, 1991b). For example, the ER Mapper image processing package which can be run in the Image Processing Centre on a SUN Microsystems workstation needs also to be available over BMRnet to PC users. Similarly, network access to the ArcInfo geographic information system (GIS) is needed if the system is to be widely used.

Fortunately network access of this kind can be implemented using the X11 Windows system developed by the Massachussetts Institute of Technology.

The X Window System, Version 11 (often referred to as X11 or X11 Windows) is a hardware and operating system independent graphics environment. Central to X11 is the concept of the **X display server** and the **X client**. The X display server is a special application which runs on a computer or terminal and controls its display screen. This X server manages windows opened on the screen and manipulates the graphics and text displayed within them. These windows can be initiated either by the actions of the user or by applications running on remote host computers connected via a network. An X client is an application program (e.g. a spreadsheet or an image processing program such as ER Mapper) that communicates with an X server in order to display its outputs. Communications between the X server and its X clients is accomplished through X11 commands.

X11 is particularly effective when it is used over a network (such as BMRnet) because it allows applications running on different host computers on the network to be accessed locally even if the hosts concerned are of different types and use widely different operating systems.

The HCL-eXceed/W X11 server recommended by Chopra (1991) represents a relatively inexpensive way in which to effectively turn existing BMR IBM-compatible PCs into "smart" X11 terminals. This software provides a fairly robust X11 server which runs under Microsoft Windows 3 and permits cut and paste procedures between UNIX and the PC using the Windows clipboard.

X11 emulators running under Microsoft Windows 3 offer two major benefits for BMR. Firstly, Microsoft Windows 3 provides a device independent graphic interface which is supported by most graphics card manufacturers. Hence almost any existing graphics card can be used on a PC to run X11. Secondly, the remote UNIX host is not responsible for management of the X Windows opened on the PC. This screen management function is handled by Microsoft Windows 3 itself. This has three benefits: it cuts down dramatically on network traffic, it reduces the load on the remote UNIX CPU and it makes for rapid screen repainting.

Installation of HCL-eXceed/W

An evaluation copy of HCL-eXceed/W (version 1.0) was provided by Information Network Solutions Pty Ltd of Artarmon, NSW. The software is a product of Hummingbird Communications Ltd. of Markham, Ontario, Canada.

System Requirements

Minimum hardware and software requirements for HCL-eXceed/W version 1.0, as specified in the manual, are:

. an IBM PC 80286, 80386 or 80486 or compatible
. Microsoft Windows version 3 in either Standard or 386 Enhanced mode
. 2 Mbyte of RAM
. an EGA, VGA, super VGA or 8514A display adapter
. a colour monitor (essential for image processing applications) or an analog monochrome monitor
. a mouse (preferably 3 button) and a mouse driver compatible with Microsoft Windows 3
. a hard disc
. an Ethernet network card
. TCP/IP software compatible with an network card from the following list:
- 3Com 3+Open TCP
- Beame & Whiteside NFS or Telnet
- Excelan LAN WorkPlace
- FTP PC/TCP
- HP ARPA Services
- Novell LAN WorkPlace
- SUN PC-NFS
- Ungermann-Bass TCP BNS/PC
- Wollongong PathWay for DOS
- Wollongong WIN/TCP for DOS

With these requirements in mind, HCL-eXceed/W was installed on 2 Osborne IBM-compatible PCs. The first was an 80386 PC which operated at a clock speed of 25 MHz and had an 80387 maths co-processor, 8 Mbyte of RAM, a Tseng Labs Mega Eva/1024 super VGA display adapter and a Logitech 3 button bus mouse. The second PC was an 80486 with 4 Mbyte of RAM, a Tseng Labs MegaEva/1024 super VGA card, a NEC 3D 14 inch multisynch monitor, a 3C503 Ethernet card and a Microsoft 2 button serial mouse. Both PCs used MS-DOS 4.01 as the operating system, Microsoft Windows 3.0 as the local window manager and TCP/IP Ethernet protocols provided by SUN Microsystems PC-NFS version 3.01.

Installing the HCL-eXceed/W files

Installation of the software is unnecessarily complex. The user must run an MS-DOS program called INSTALL which is provided on the distribution disc from the MS-DOS prompt. Because INSTALL is not a Microsoft Windows program it is

unable to build the necessary new program group for HCL-eXceed/W in Windows, nor is it able to add the HCL-eXceed/W program items to this group. The user therefore has to manually perform these tasks. Other X11 servers for Microsoft Windows adopt a much more user-friendly approach by handling all aspects of installation (Chopra, 1991a).

The opening screen of INSTALL is shown in Figure 1. In this screen the user must indicate where the program files for HCL-eXceed/W are to be stored.

```
                HCL-eXceed/W Install Utility  Version 4.2
          Copyright (C) Hummingbird Communications Ltd. 1989-1991

          The installation may be cancelled at any time by CTRL+C

You must specify a root directory.  The following directories will be created
if they do not already exist:

   ROOT                 applications
   ROOT\work            run time files
   ROOT\source          source files
   ROOT\info            information files such as README

If the following directory is not your desired ROOT directory, edit the field.
Note that a drive specification must be included.  When the field describes
the directory you wish to use, enter Return.

   C:\EXCEEDW\
```

Figure 1 The opening screen of the INSTALL program for HCL-eXceed/W. Choosing the drive and directory in which the X11 files will be stored.

INSTALL assumes that the files for the X11 server will be stored in the default directory EXCEEDW on the C drive of the computer. The user can however specify some other drive and directory name. The most important requirement is that at least 4.69 Mbyte of disc space must be available for the HCL-eXceed/W files. This figure does not include the storage requirements of the TCP/IP transport software (e.g. PC-NFS which uses 1.49 Mbyte).

Once the destination directory for the HCL-eXceed/W files has been typed and the RETURN key pressed, the user will then see the screen shown in Figure 2.

```
                HCL-eXceed/W Install Utility  Version 4.2
          Copyright (C) Hummingbird Communications Ltd. 1989-1991

          The installation may be cancelled at any time by CTRL+C

You must specify the type of installation to be performed:

   C   complete installation.

   S   partial installation.  Only use this setting if you have already
       installed, and you are switching to a different server in the
       same release. For example:  8514A <-> EGA/VGA

   T   partial installation.  Only use this setting if you have already
       installed, and you are changing transports.

   P   partial installation.  This is equivalent to 'S' and 'T'.

   U   update installation.  If you are updating to a new release, this
       setting will only copy files which are newer than those already
       installed.

Enter a selection:
```

Figure 2 The second screen of the INSTALL program for HCL-eXceed/W. Choosing the type of installation needed.

For a new installation of HCL-eXceed/W enter a C at this screen. Option S is unlikely to be used in BMR since there are no plans to purchase alternative HCL-eXceed products (e.g. HCL-eXceed 8514). Option T would only be used if a PC which already had HCL-eXceed/W running using one TCP/IP program was being converted to use a different program (e.g. SUN's PC-NFS to Novell's Lan Workplace). Option U would be used to upgrade HCL-eXceed/W to a new version in the event that the installation procedures continue to use this INSTALL program with future releases.

The third screen of INSTALL is shown in Figure 3. In this screen the user must specify which TCP/IP transport package is to be used to provide the Ethernet communications link between the PC X11 server and the remote UNIX hosts that are going to be accessed (e.g. the ZIRCON SUN 4/470). If you are unsure, ask your system administrator.

```
                HCL-eXceed/W Install Utility  Version 4.2
          Copyright (C) Hummingbird Communications Ltd. 1989-1991

          The installation may be cancelled at any time by CTRL+C


You must specify the TCP/IP transport which you will be using:

   3   3Com Corporation                  3+Open TCP
   D   Beame & Whiteside Software Ltd.   NFS or Telnet Package
   F   FTP Software Inc.                 PC/TCP Network Software for DOS
   H   Hewlett Packard                   HP ARPA Services/MS-DOS
   N   Novell Inc.                       Lan WorkPlace for DOS
   S   Sun Microsystems                  PC/NFS
   U   Ungermann-Bass                    TCP BNS/PC
   W   The Wollongong Group              PathWay for DOS

Enter a selection:
```

Figure 3 The third screen of the INSTALL program for HCL-eXceed/W. Defining the TCP/IP network protocol program.

In the fourth screen of INSTALL, the user must decide which X11 fonts are to be used. Experience with HCL-eXceed/W suggests that PCs driving display screens at resolutions of 1024 by 768 are best served by the 100 dpi fonts. These fonts are equally serviceable on 14" and 20" screens. For lower screen resolutions (particularly the standard VGA resolution of 640 by 480) the 75 dpi fonts would be more appropriate. The fourth screen is shown in Figure 4.

The X11 fonts that are copied from the HCL-eXceed/W distribution discs are very extensive and take up a considerable amount of disc space on the hard disc that is used to install HCL-eXceed/W (e.g. the 100 dpi fonts take up 2.02 Mbyte of disc space). For this reason it is usually not advisable to choose the A option in Figure 4 unless it is expected that the PC will be used with different size monitors from time to time.

The screen output of INSTALL during the font copying phase of the program is illustrated in Figure 5. Each font is stored on the distribution discs in a compressed format and INSTALL expands them and copies them to the hard disc in the \EXCEEDW\WORK\100DPI or \EXCEEDW\WORK\75DPI directory respectively. The former directory contains 198 font files once installation is complete and all of these can be used in X11 Windows. HCL-eXceed/W is also able to use any of the fonts available to Microsoft Windows 3 and is able to import other X11 fonts. Details on these additional font capabilities are given in the README file in the /EXCCEDW/INFO directory for version 1.0 of HCL-eXceed/W.

```
                HCL-eXceed/W Install Utility  Version 4.2
          Copyright (C) Hummingbird Communications Ltd. 1989-1991

          The installation may be cancelled at any time by CTRL+C

Many general purpose fonts are automatically loaded during the installation
process.  These general purpose fonts may be used by any server.  Additional
fonts are available in two different sizes: 75 dots per inch and 100 dots per
inch.  Typically the 100dpi fonts will only be required if you are using
a display resolution of 1024x768 or greater.

The LFP.SRC file must contain the names and search order of the font
directories to be included in the font database.  If you are doing a complete
installation, this file will be automatically created.  The contents of the
created file and which fonts are available, depends on which set of fonts you
install.

   1   Only load the 75dpi fonts.  (placed in ...\WORK\75dpi)

   2   Only load the 100dpi fonts. (placed in ...\WORK\100dpi)

   A   Load 75dpi and 100dpi fonts.

Enter a selection:
```

Figure 4 The fourth screen of the INSTALL program for HCL-eXceed/W. Choosing the appropriate X11 font set for the PC screen resolution.

```
                HCL-eXceed/W Install Utility  Version 4.2
          Copyright (C) Hummingbird Communications Ltd. 1989-1991

          The installation may be cancelled at any time by CTRL+C


Expanded \DB\rgb.xdb to c:\exceed1\work\rgb.xdb
Expanded \DB\lfp.xdb to c:\exceed1\work\lfp.xdb
Expanded \DB\us.kbi to c:\exceed1\work\us.kbi
Expanded \DB\rgb.src to c:\exceed1\source\rgb.src
Expanded \DB\belgian.src to c:\exceed1\source\belgian.src
Expanded \DB\danish.src to c:\exceed1\source\danish.src
Expanded \DB\dutch.src to c:\exceed1\source\dutch.src
Expanded \DB\frencan.src to c:\exceed1\source\frencan.src
Expanded \DB\french.src to c:\exceed1\source\french.src
Expanded \DB\german.src to c:\exceed1\source\german.src
Expanded \DB\italian.src to c:\exceed1\source\italian.src
Expanded \DB\latinam.src to c:\exceed1\source\latinam.src
Expanded \DB\norwegia.src to c:\exceed1\source\norwegia.src
Expanded \DB\portugue.src to c:\exceed1\source\portugue.src
Expanded \DB\swiss.src to c:\exceed1\source\swiss.src
Reading \DB\spanish.src
```

Figure 5 The fifth screen of the INSTALL program for HCL-eXceed/W. Expanding and copying the chosen font set to the hard disc.

Changing AUTOEXEC.BAT

The final screen of INSTALL is shown in Figure 6. This screen is concerned with **some** of the necessary changes that must be made to the AUTOEXEC.BAT file used to start the PC prior to running X11 sessions with HCL-eXceed/W. These changes can be made automatically by INSTALL by choosing the first option (RETURN) or they may be made later by the user (ESC). The first change:

set EXCEEDW=C:\EXCEEDW

establishes a variable in the MS-DOS environment table which directs HCL-eXceed/W to its own files. The second change:

path = %path%;C:\EXCEEDW

appends the name of the drive and directory which contain the HCL-eXceed/W files to the existing path variable in the MS-DOS environment table.

```
                HCL-eXceed/W Install Utility  Version 4.2
          Copyright (C) Hummingbird Communications Ltd. 1989-1991

          The installation may be cancelled at any time by CTRL+C


The following lines should be placed into your AUTOEXEC.BAT file:

   set EXCEEDW=C:\EXCEED1

   path=%path%;C:\EXCEED1

You must decide if INSTALL is to modify the AUTOEXEC.BAT file

   Return  if you want to modify the AUTOEXEC.BAT file

   Esc     if you DO NOT want to modify the AUTOEXEC.BAT file

Enter a selection:
```

Figure 6 The sixth screen of the INSTALL program for HCL-eXceed/W. Making the first set of modifications to AUTOEXEC.BAT.

In addition to these changes to AUTOEXEC.BAT, another set of changes must be made before HCL-eXceed/W can be used. These changes must be made manually and are:

1) the appropriate application program interface (API) must be run before Microsoft Windows loads. The identity of the API depends upon the TCP/IP transport being used (e.g. for SUN Microsystems' PC-NFS, the API is loaded with the program NFSAPI.EXE). More details on the API for particular TCP/IP transports can

be found in the README file in the \EXCEEDW\INFO directory for version 1.0 of HCL-eXceed/W. There are two ways to load the API:

a) The API program can be run prior to starting Microsoft Windows.
The procedure in this case is usually to include a line in the AUTOEXEC.BAT file immediately before the call to Microsoft Windows. For PC-NFS, the appropriate line to add is:

```
C:\EXCEEDW\NFSAPI
```

The disadvantage of this technique is that the API consumes random access memory (RAM) and reduces the amount of memory available to all processes subsequently spawned by Microsoft Windows. Thus for example, MS-DOS shells run from Microsoft Windows will have less RAM available than they would otherwise have had (with the PC-NFS API available RAM is reduced by 110 Kbyte).

b) The API program can be run from a special Microsoft Windows batch file called WINSTART.BAT. By placing the command line required to load the memory resident API in the WINSTART.BAT batch file, Windows will make it available to Windows applications only and prevent it from taking memory away from non-Windows applications.
For example, in the case of the FTP PC/TCP transport you might want to create a WINSTART.BAT batch file in your Windows 3.0 directory containing the command lines needed to invoke your network kernel and HCL's FTPAPI utility. When Windows 3.0 loads in 386 enhanced mode you will be able to run HCL-eXceed/W and all its utilities, but when you go to a DOS prompt or run a DOS application the utilities contained in WINSTART.BAT will not occupy memory in the DOS box. The downside to this technique is you will not be able to access the network from the DOS prompt or application.
For more information regarding WINSTART.BAT and other Windows' optimization techniques consult Chapter 13 of the "Microsoft Windows User's Guide, Version 3.0" (WINSTART.BAT is discussed on page 519).

2) A special utility named XPORT.EXE must be run after the API has been loaded and prior to running HCL-eXceed/W. This utility only needs to be run once per Microsoft Windows session. This utility may be run in any one of the three following ways, as illustrated for PC-NFS:

a) WIN xport
This starts Microsoft Windows and XPORT.EXE. Note that if NFSAPI was loaded with the -a option, and a value other than 61 was specified, you must specify: WIN xport nn where nn represents the -a value (see the \EXCEEDW\INFO\README file).

b) WIN.INI file
Use the load statement in the WIN.INI file to automatically start XPORT.EXE.

c) Program Manager
Run XPORT.EXE from the Program Manager.

Changing WIN.INI

The Microsoft Windows WIN.INI file must also have some entries added to it using an ASCII editor (e.g. the Microsoft Windows Notepad editor) in order for HCL-eXceed/W to function properly. The details of the changes to this file vary with the type of TCP/IP transport being used as is described in the EXCEEDW\INFO\README file. For PC-NFS the following entries must be added to WIN.INI under the heading [386Enh].

```
[386Enh]
InDOSPolling=on
UniqueDOSPSP=true
PSPIncrement=5
TimerCriticalSection=1000
```

If the [386Enh] heading doesn't already exist in WIN.INI then it must be created. Its position within the file is not critical but it should be preceded and followed by a blank line.

Note: The WIN.INI file is a very important part of the Microsoft Windows installation and its integrity must be protected. The best policy when making changes to this file is to always make a back-up copy first so that it can be recovered in the event of inadvertent damage.

Installing HCL-eXceed/W in Microsoft Windows

Once all the files have been copied on to the hard disc of the PC that is going to be used to run HCL-eXceed/W, the programs that make up the HCL-eXceed/W package must be installed in Microsoft Windows. The following figures illustrate the steps that should be taken to do this. More details can be found in the Microsoft Windows User's Guide.

The first step is to create a new Program Group on the Microsoft Windows desktop into which the HCL-eXceed/W programs will be put. Figures 7-9 illustrate the procedures.

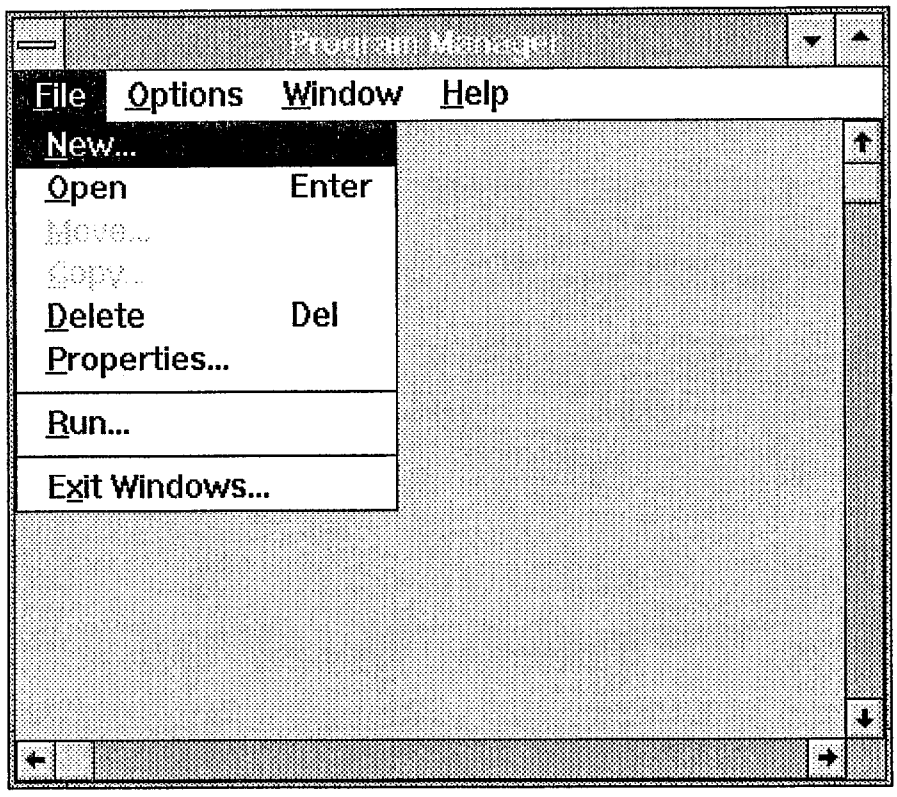

Figure 7 Select New from the Program Manager FILE menu.

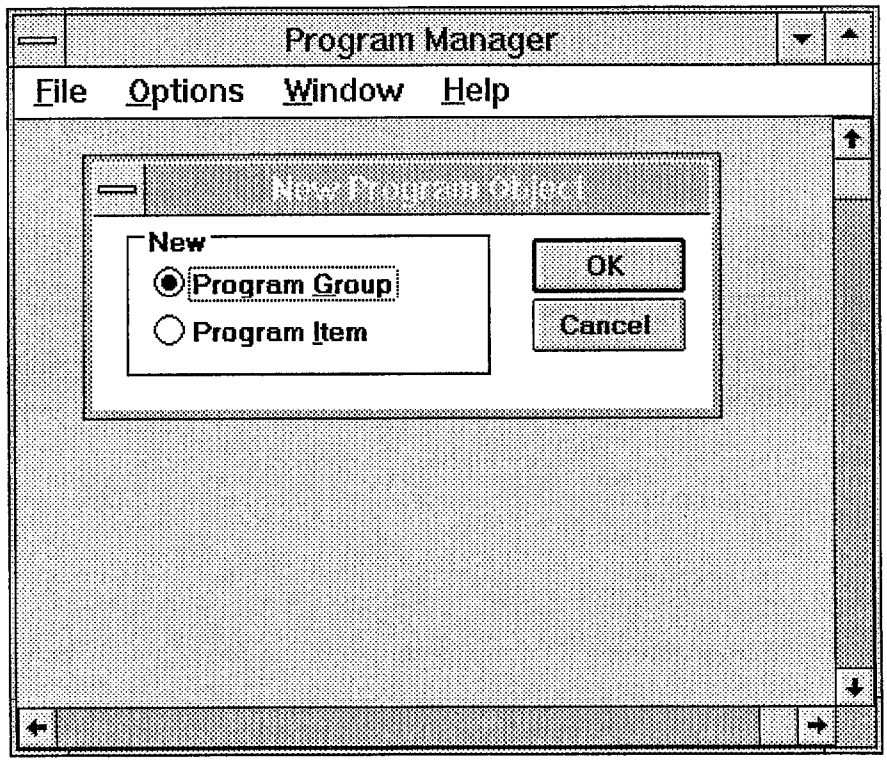

Figure 8 Choose new Program Group

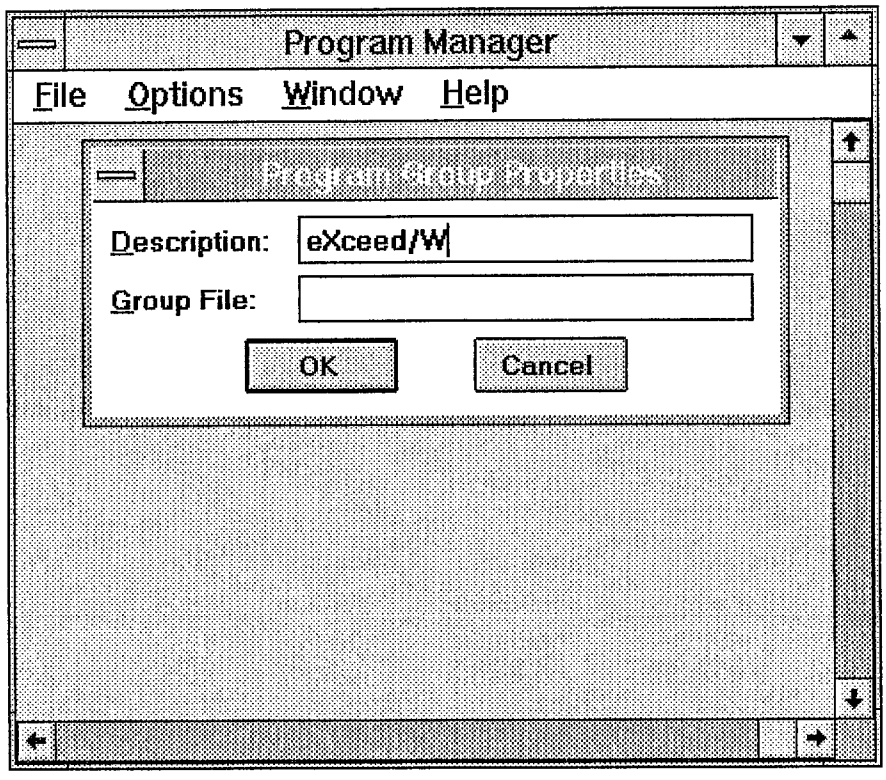

Figure 9 Give the new Program Group a meaningful name and click OK

The HCL-eXceed/W programs must now be added to the new Program Group. Initially the HCL-eXceed/W, XconfigP and Xstart programs should be added. Later, icons will be added to this Program Group for each of the UNIX hosts on which X11 sessions are to be run (e.g. GARNET, the SUN 4/280 UNIX mail server). The procedures to install the HCL-eXceed/W programs are illustrated in Figures 10 - 16.

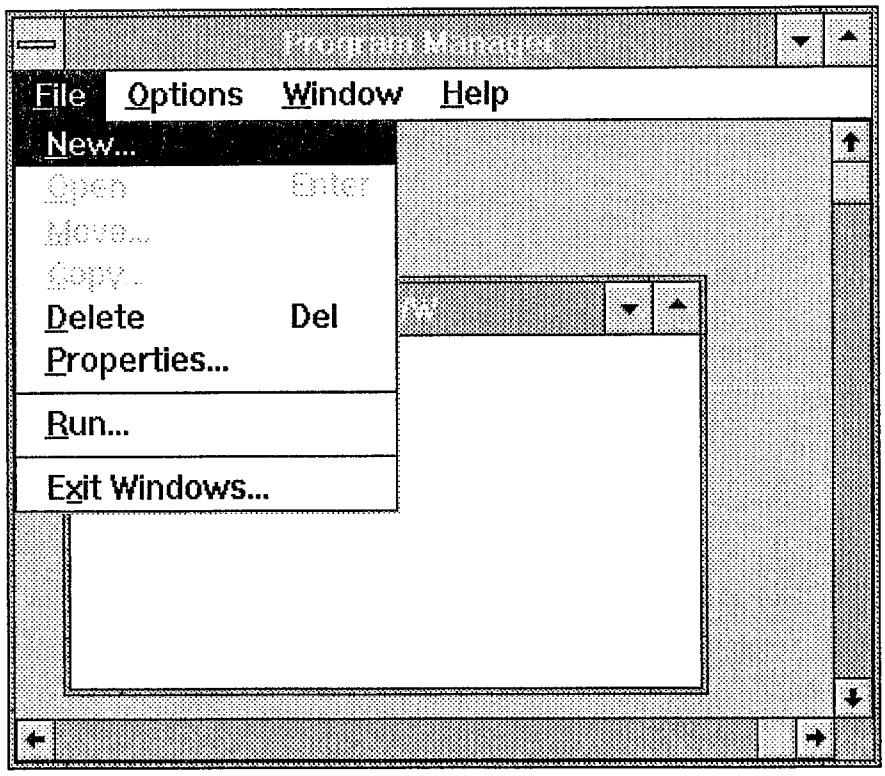

Figure 10 Select New from the Program Manager FILE menu.

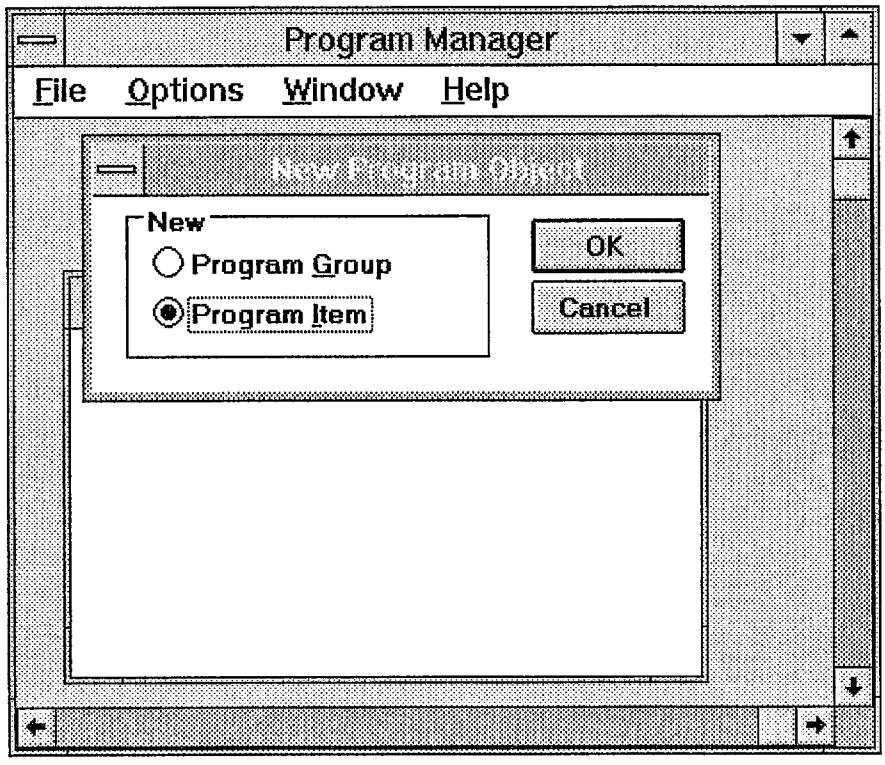

Figure 11 Choose Program Item and click OK

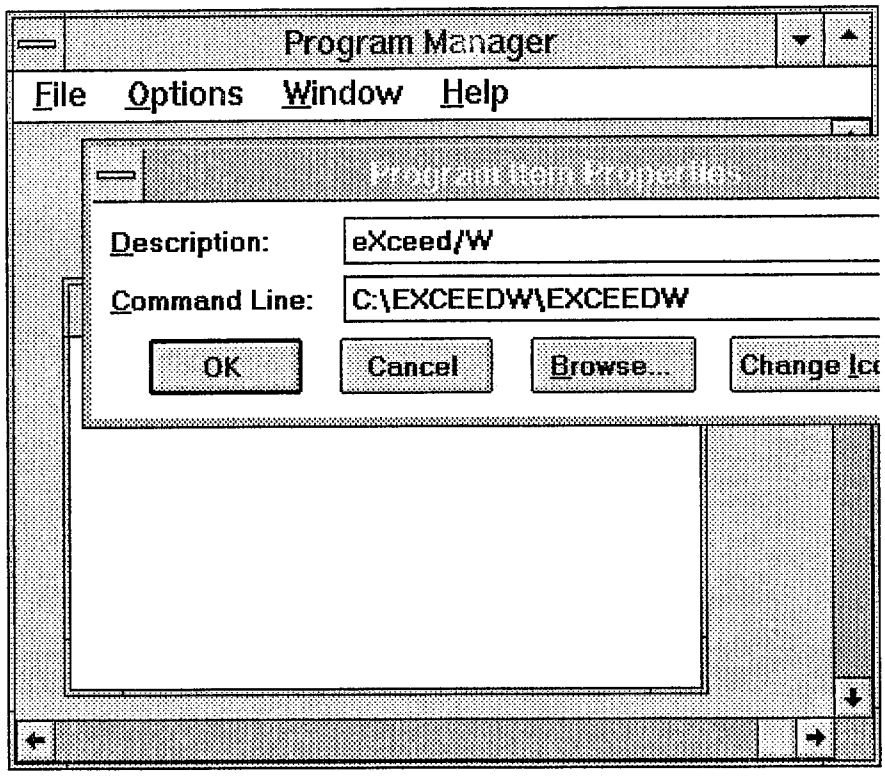

Figure 12 Enter the descriptive name and command as shown and click OK.

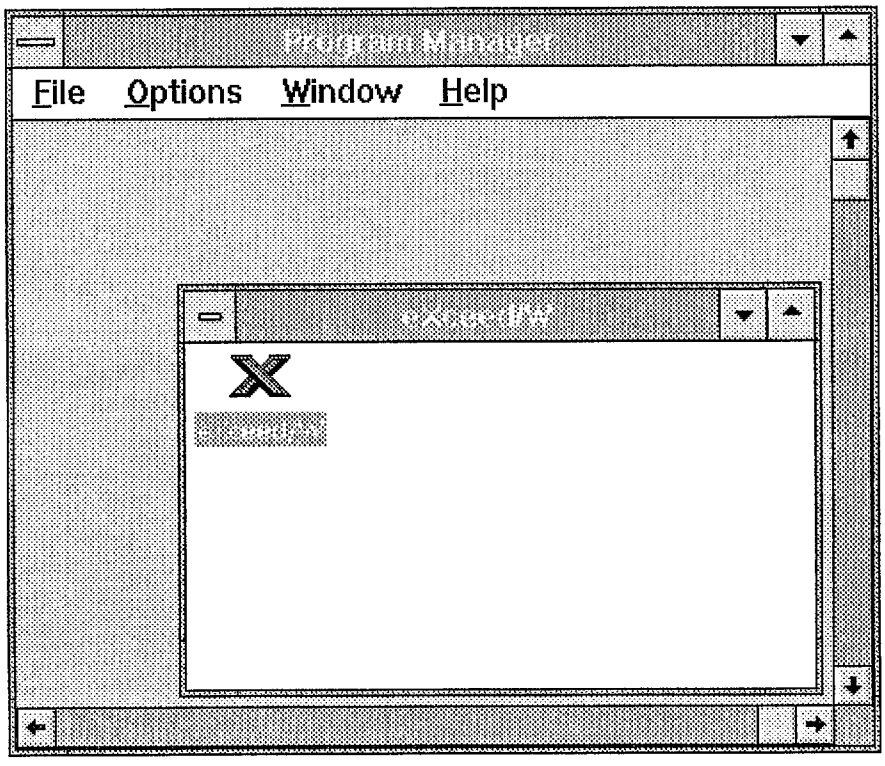

Figure 13 The new Program Group should now display the eXceed/W icon.

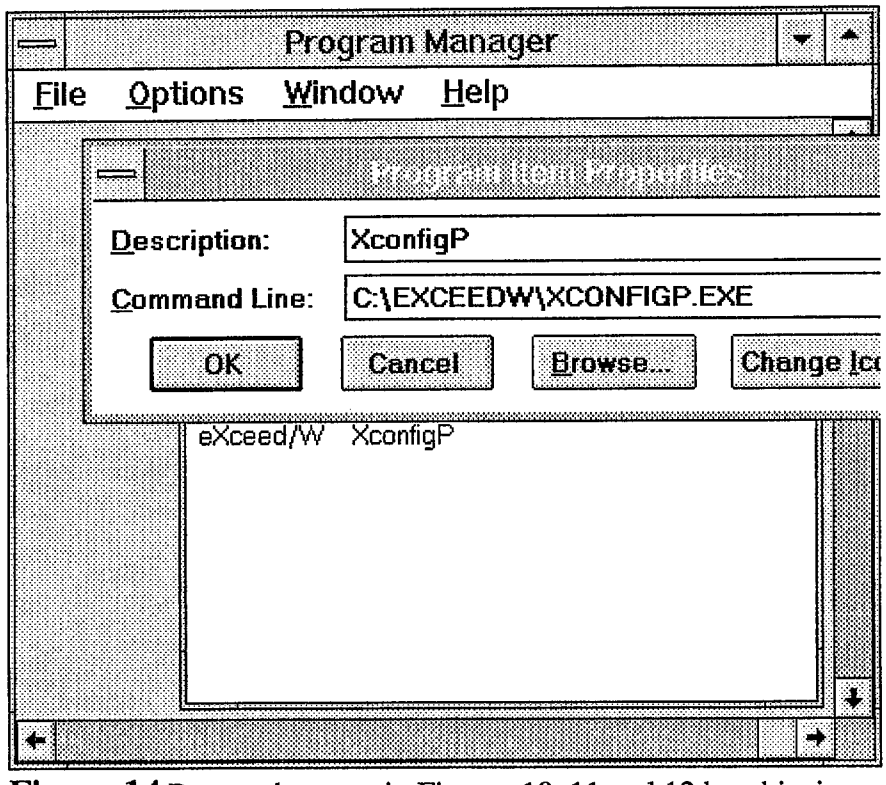

Figure 14 Repeat the steps in Figures 10, 11 and 12 but this time enter the details for the XconfigP program.

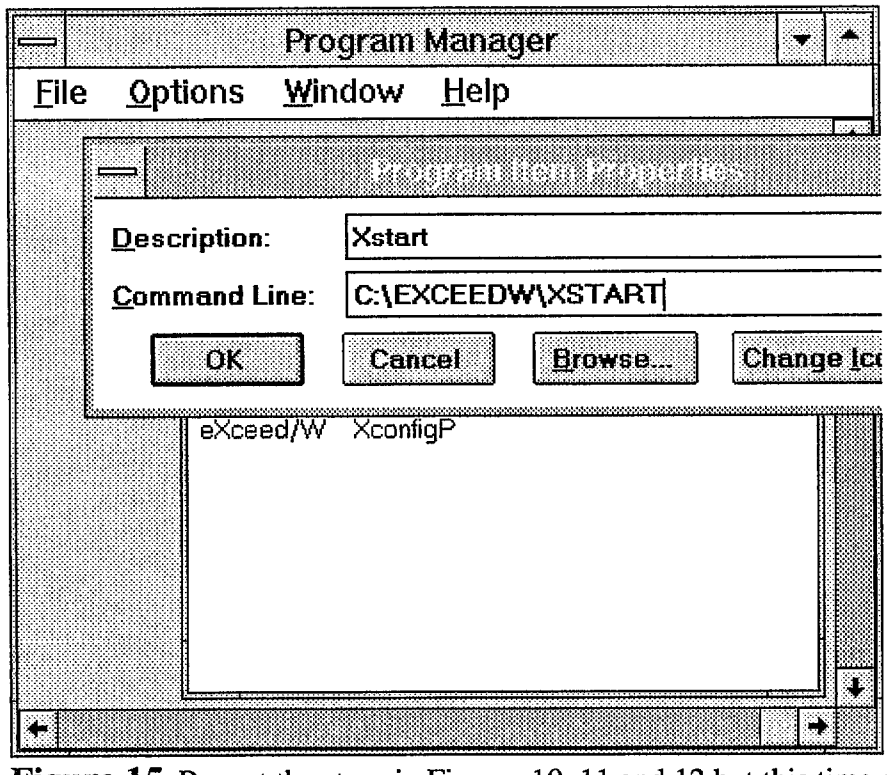

Figure 15 Repeat the steps in Figures 10, 11 and 12 but this time enter the details for the Xstart program.

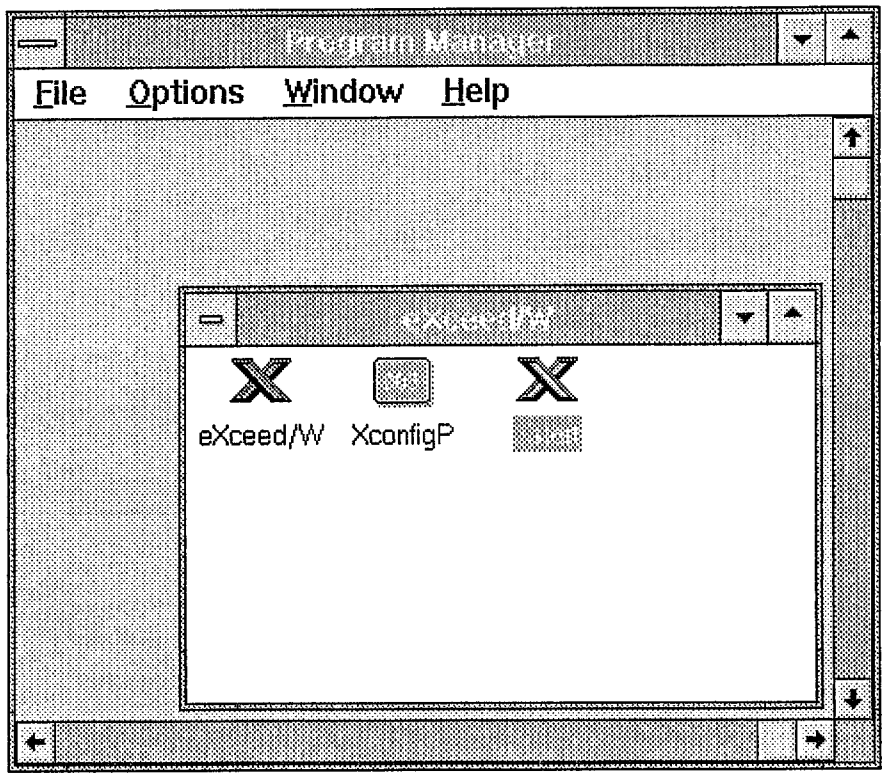

Figure 16 The new Program Group will now contain three icons as shown.

Configuration of HCL-eXceed/W

Using XconfigP

Configuration of the HCL-eXceed/W software is controlled through the XconfigP program. XconfigP is an MS-DOS program which can be run either from within Microsoft Windows in the usual ways (double clicking on the icon, using the RUN command from the Program Manager FILE menu or executing from File Manager) or from the MS-DOS command line. The XconfigP program is menu-driven but it does not support control with a mouse. Options are selected with the keyboard and entries must be typed into the appropriate fields as necessary. The configuration procedures are described in the following figures.

The main menu of XconfigP is shown in Figure 17. The various input screens of XconfigP are chosen either by stepping up and down the list with the arrow keys, or by pressing the key shown on the left hand side of the menu box (e.g. the F8 function key opens the Font Directory List screen). Context-sensitive help is available in most parts of XconfigP by pressing the F1 function key. This help facility is illustrated in Figure 18.

In order to configure HCL-eXceed/W to run successfully with BMRnet and the SUN fileservers attached to it, the user should duplicate the entries which appear in the following XconfigP screens (Figures 19 - 32).

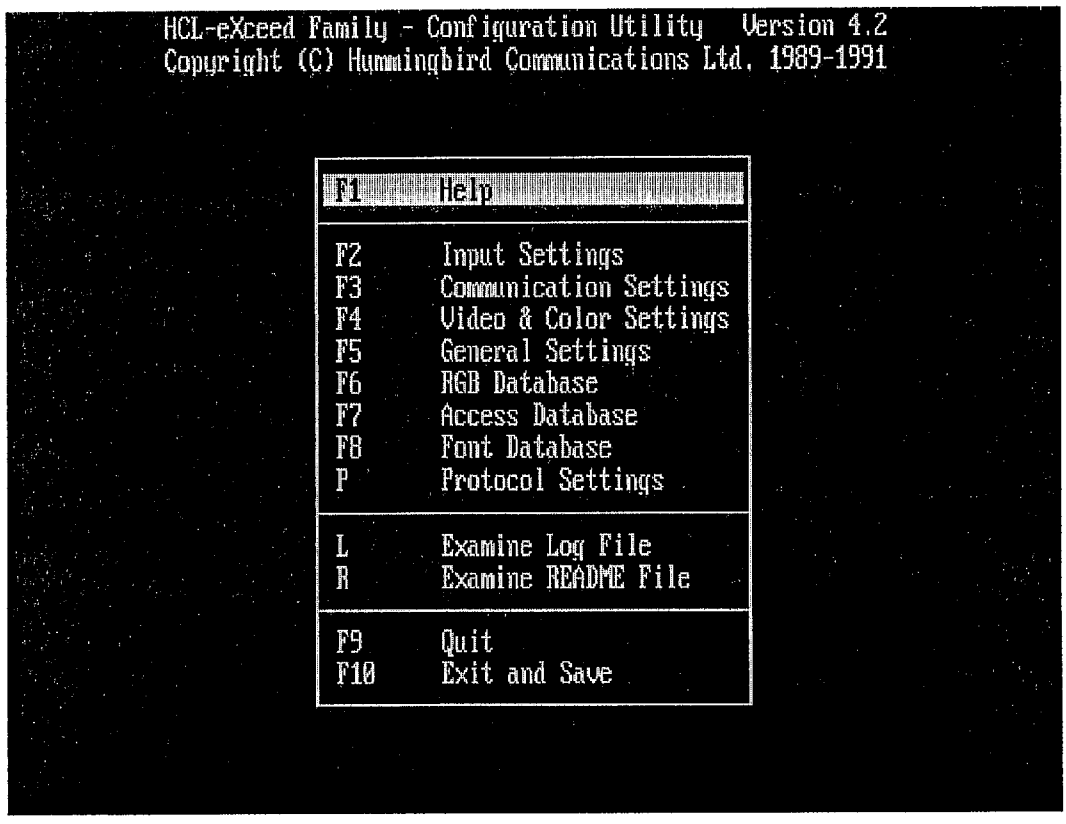

Figure 17 The main menu screen of the XconfigP.

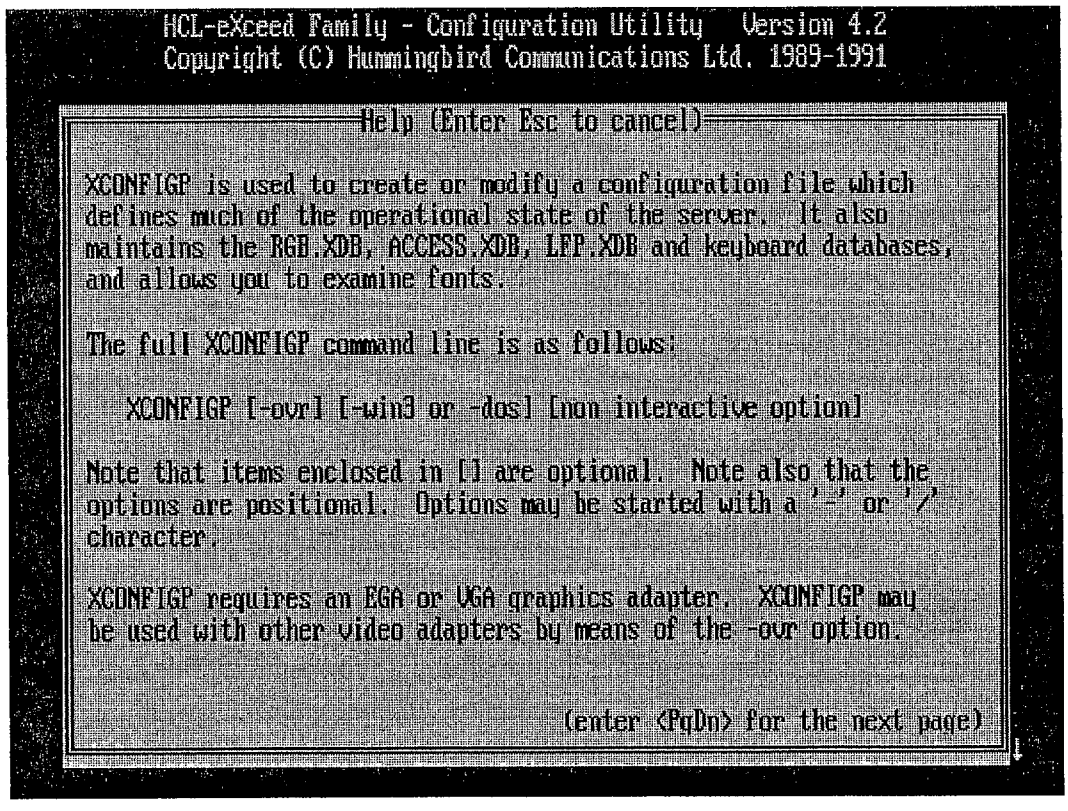

Figure 18 An example of context-sensitive help in XconfigP. Help screens like this are called up with the F1 function key.

PCs with a 3-button mouse should be configured with that option selected in the "Input Settings" input screen of XconfigP (Figure 20). Use the left or right arrow keys to cycle between the two permissible options (i.e. 2-button and 3-button mice). HCL-eXceed/W provides a 3-button emulation for 2-button mice. The user sends a middle-button click by clicking the left and right buttons simultaneously.

The "Communications Settings" input screen (Figure 22) requires some modifications from that shown to suit the particular PC being set up for HCL-eXceed/W. The screen as shown in the figure refers to a PC using PC-NFS as the TCP/IP transport and hence the hosts file is \NFS\HOSTS. PCs set up with other TCP/IP transports will have a different entry in this field. Similarly, the name of the new X11 server will be different from the "peridot" shown in Figure 22 as will the identity of the principal user. The latter entry determines the entry for the userid field and for the field which specifies the path of the **.xceed** command file (here /mnt/pramec). This command file will be discussed later. The other fields in Figure 22 will be the same for all HCL-eXceed/W users.

The "Video & Color Settings" input screen (Figure 24) will also contain entries which vary from PC to PC. In this case, the variation will be due to different screen resolutions. For the HCL-eXceed/W configuration shown in Figure 24, the PC has a screen size of 1024 by 768. For PCs with resolutions which differ from this, the Virtual X and Virtual Y fields should be changed appropriately.

The "General Settings" input screen will only differ for an HCL-eXceed/W installation from that shown in Figure 26 if the directory in which the files have been stored is something other than \EXCEEDW. In this case the first input field should be modified accordingly.

The "RGB Database" and "Access Database" input screens (see Figure 17) would normally not need to be used when configuring HCL-eXceed/W for PCs in BMR.

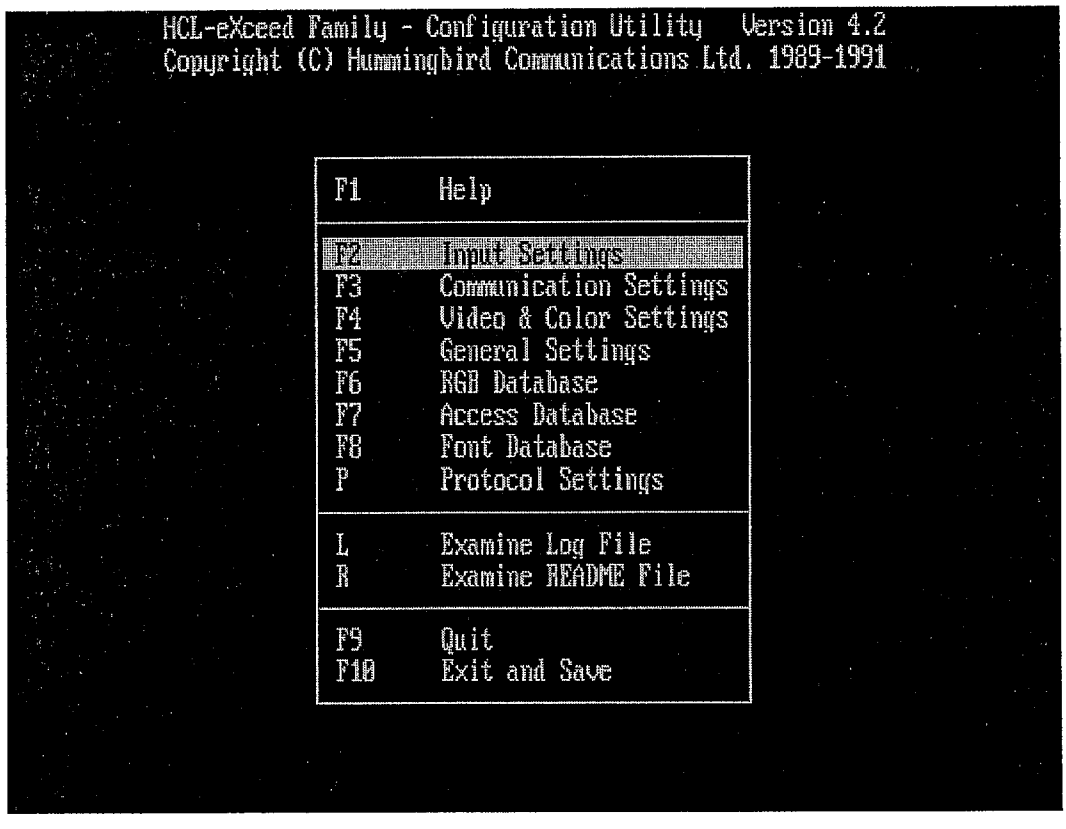

Figure 19 Choosing the "Input Settings" input screen in XconfigP.

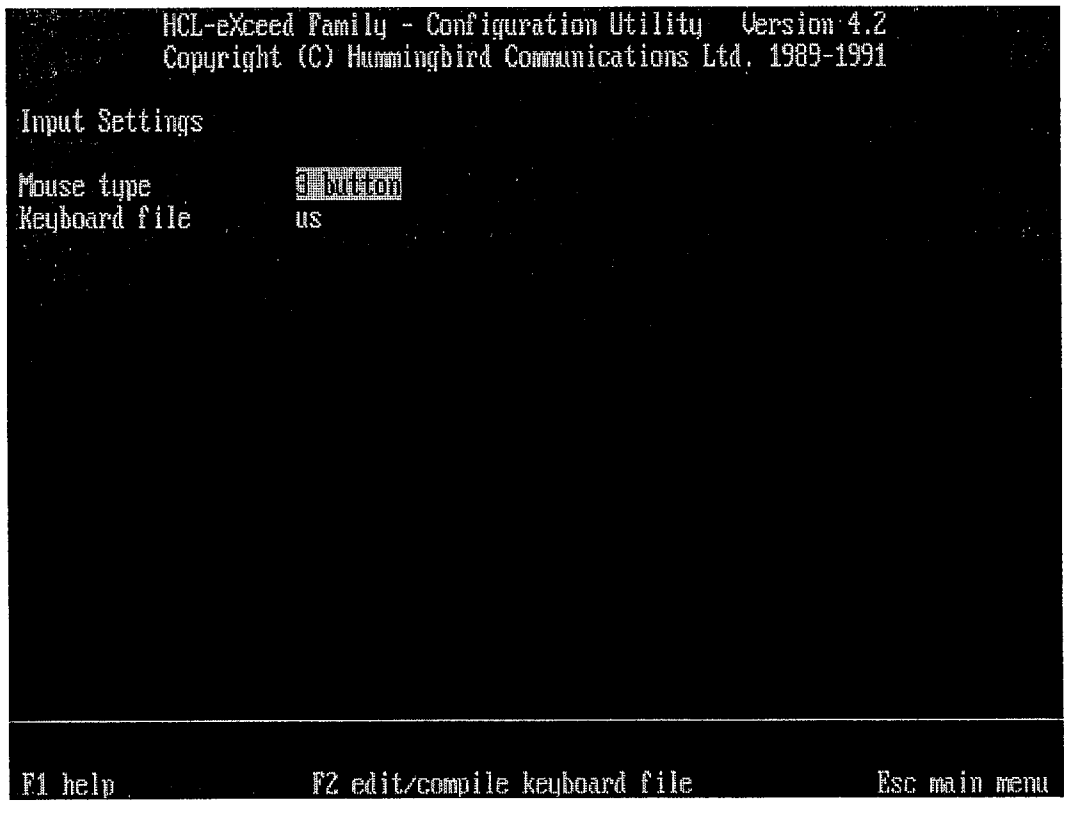

Figure 20 The "Input Settings" data input screen in XconfigP.

```
HCL-eXceed Family - Configuration Utility   Version 4.2
Copyright (C) Hummingbird Communications Ltd. 1989-1991

F1      Help

F2      Input Settings
F3      Communication Settings
F4      Video & Color Settings
F5      General Settings
F6      RGB Database
F7      Access Database
F8      Font Database
P       Protocol Settings

L       Examine Log File
R       Examine README File

F9      Quit
F10     Exit and Save
```

Figure 21 Choosing the "Communications Settings" input screen in XconfigP.

```
HCL-eXceed Family - Configuration Utility   Version 4.2
Copyright (C) Hummingbird Communications Ltd. 1989-1991

Communication Settings

Startup mode      RSH
Hosts file        c:\nfs\hosts
Connect host      garnet
Server name       peridot
Connect timeout   1 minute
Write timeout     5 seconds
Keep alives       Yes
Recv EOL          Both
Send EOL          CR
Newline           No
Backspace         EC
Keep stream       Yes
User id           pramec
Command 1         /mnt/pramec/.xceed peridot
Command 2

F1 help                    F2 edit hosts file                    Esc main menu
```

Figure 22 The "Communications Settings" input screen in XconfigP.

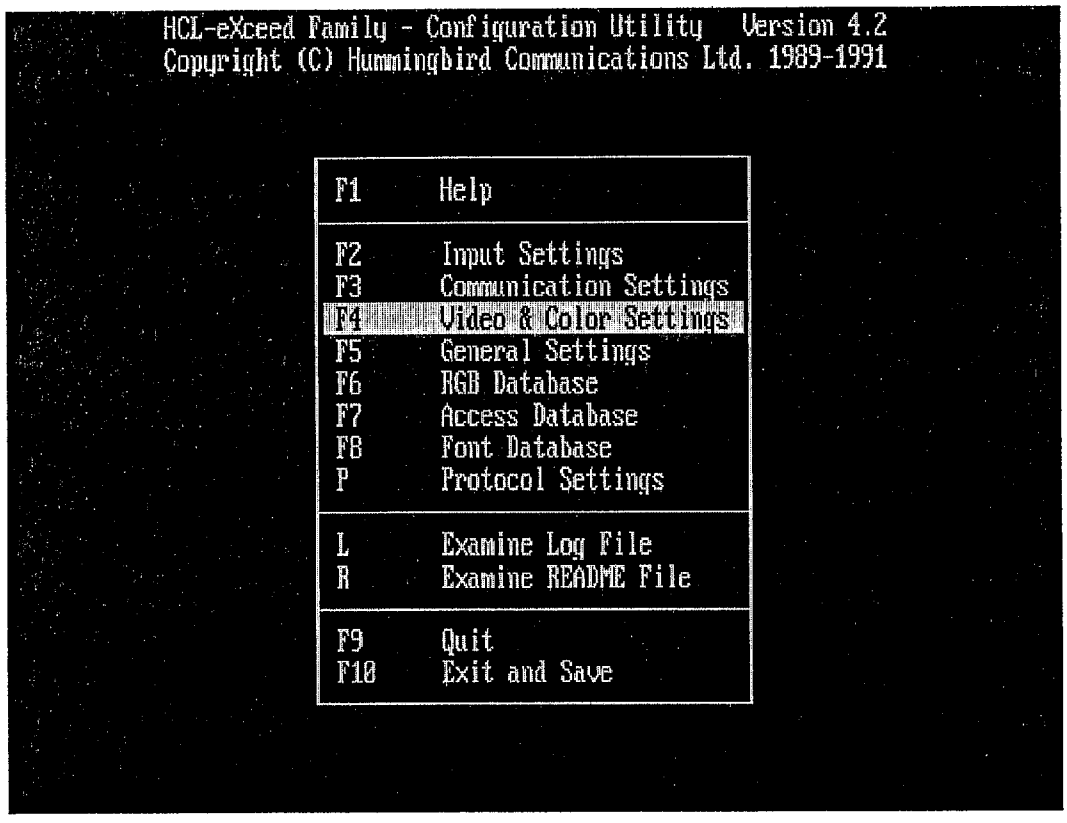

Figure 23 Choosing the "Video & Color Settings" input screen in XconfigP.

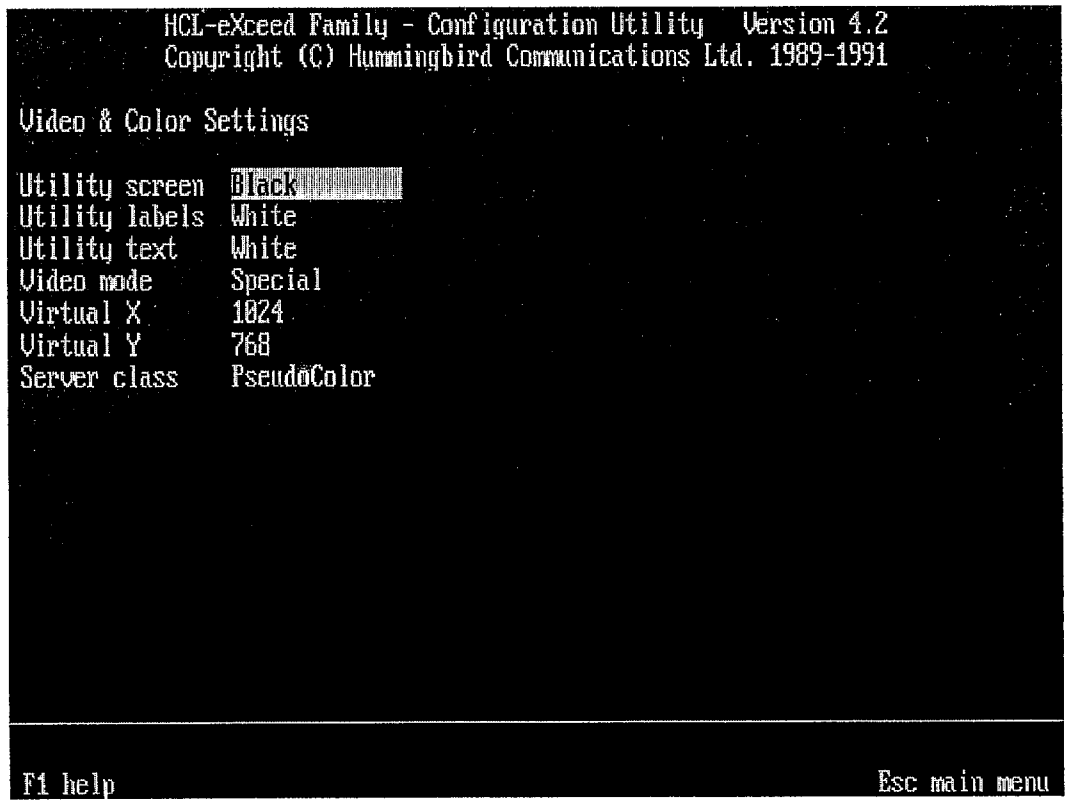

Figure 24 The "Video & Color Settings" input screen in XconfigP.

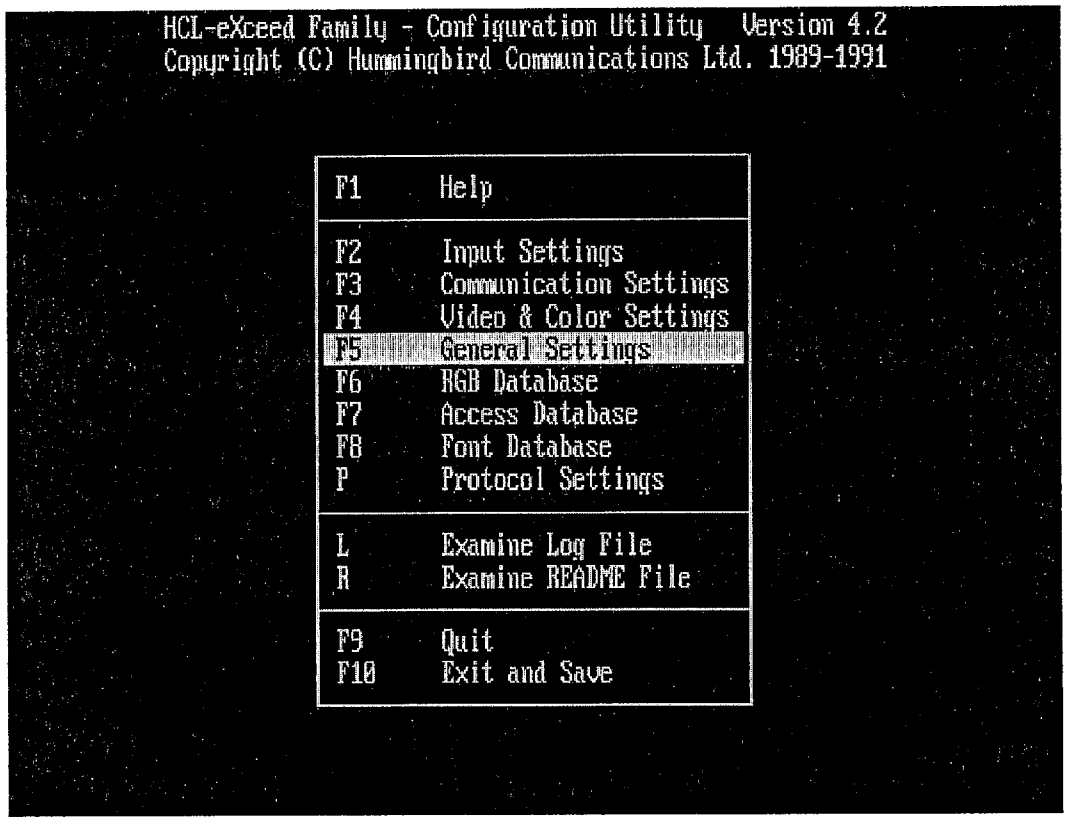

Figure 25 Choosing the "General Settings" input screen in XconfigP.

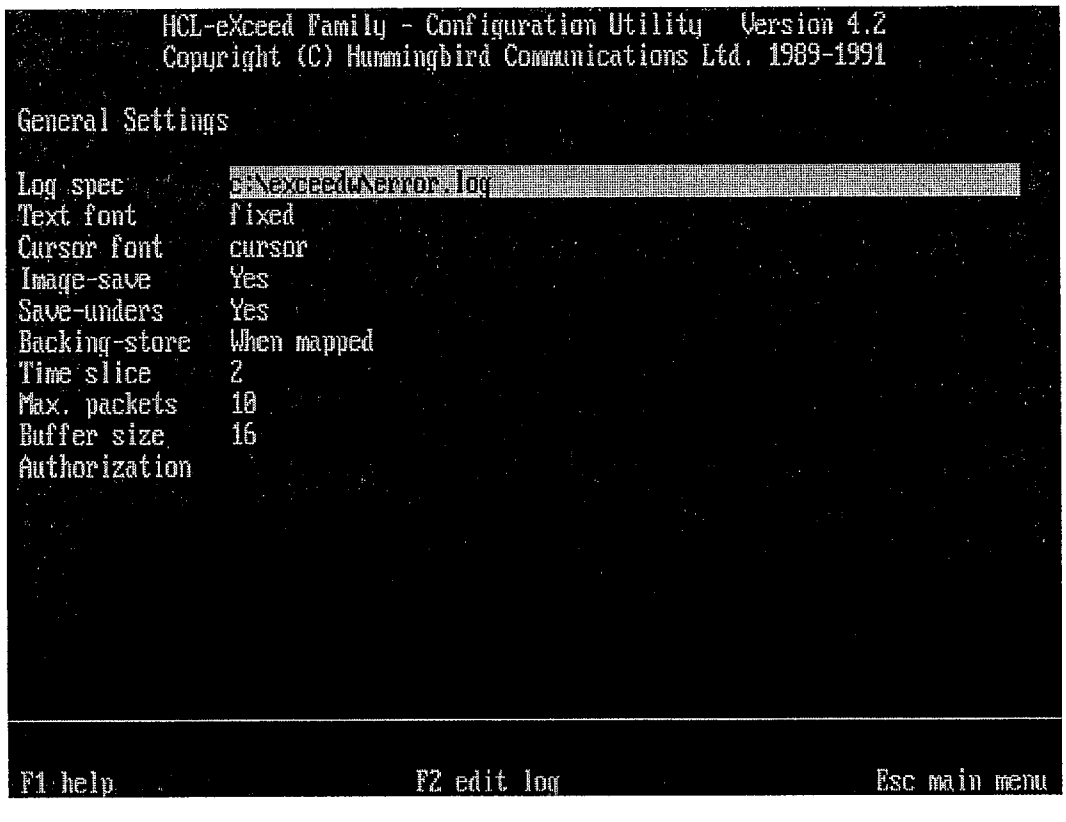

Figure 26 The "General Settings" input screen in XconfigP.

```
HCL-eXceed Family - Configuration Utility   Version 4.2
Copyright (C) Hummingbird Communications Ltd. 1989-1991

F1      Help

F2      Input Settings
F3      Communication Settings
F4      Video & Color Settings
F5      General Settings
F6      RGB Database
F7      Access Database
F8      Font Database
P       Protocol Settings

L       Examine Log File
R       Examine README File

F9      Quit
F10     Exit and Save
```

Figure 27 Choosing the "Font Database" screens in XconfigP.

```
#   This file defines which directories are to be included in the font
#   database.

#   each information line in this file has the following format:
#
#       directory-path  [P]
#
#   Note that a leading '$' in 'directory-path' implies '...\WORK\' where '...'
#   is replaced by the path specified in the server's environment variable.
#
#   'P' is optional and implies that physical font names are automatically
#   included in font searching, within the directory.

$  P            # include all fonts in ...\WORK
$100dpi  P      # include all fonts in ...\WORK\100dpi

F1=help         F2=del line     F3=cut lines    F4=paste lines  F5=cut chars
F6=paste chars  F7=search+      F8=search-      F9=quit         F10=compile/exit

lfp.src         size=15   line=0    col=0    len=70   top=0    bottom=15   Insert
```

Figure 28 The "Font Directory List" in XconfigP.

```
HCL-eXceed Family - Configuration Utility   Version 4.2
Copyright (C) Hummingbird Communications Ltd. 1989-1991

Physical     Logical    Dir=C:\EXCEEDW\WORK\

>0000        ∎/h:13/wi:8
>0000∎       fixed
>0000∎       vtsingle
>0000∎       variable
>0000∎       oldeng
>0000∎       8x13
>0001        ∎/h:13/wi:8/we:bold
>0001∎       8x13bold
>0002        ∎/h:12/wi:6
>0002∎       6x12
>0003        ∎/h:13/wi:6
>0003∎       6x13
>0004        ∎/h:15/wi:9
>0004∎       9x15

S   search forward     B   search backward     N   next        P  previous
F1  help               F2  edit logical field  Alt+F2 delete logical field
F3  make an alias      F4  delete an alias     F5  build logical name
Alt+F5 build all       F6  font info           Alt+F6 character info
F7  font properties    F8  view font           F9  cancel    F10 main menu
```

Figure 29 Modifying the "Font Database" in XconfigP.

ER Mapper Version 2.0 requires a particular X11 font called **d12lucida.snf** and HCL-eXceed/W does not directly support this font. It is therefore necessary to establish a font alias so that HCL-eXceed/W will substitute another suitable font when ER Mapper requests d12lucida. This font aliasing procedure is rather complex. The steps to follow to build a font alias are as follows:

1) Get into the font database by following the steps shown in Figures 27-29.
2) Step through the database file by pressing the down arrow key until the font name LUBBI12 is highlighted.
3) Press the F3 function key to make a new alias. The entry LUBBI12 followed by an open box symbol will be created in the font database and will be highlighted.
4) Press the F2 function key to edit the logical name. The cursor will drop to the bottom of the screen. Type the word lucid and then press the RETURN key. The font database will now contain the line:
   LUBBI12 lucid
5) Press the F10 function key to leave the font database and return to the XconfigP main menu (Figure 17).

Steps 1 - 5 above can be used to establish a font alias for any X11 font that might be required for a given software package. Users can also substitute preferred fonts for ones which they do not like (e.g. if a font being used is too small to be easily read, a larger font can be substituted) in software packages by using these steps.

```
HCL-eXceed Family - Configuration Utility   Version 4.2
Copyright (C) Hummingbird Communications Ltd. 1989-1991

F1      Help

F2      Input Settings
F3      Communication Settings
F4      Video & Color Settings
F5      General Settings
F6      RGB Database
F7      Access Database
F8      Font Database
P       Protocol Settings

L       Examine Log File
R       Examine README File

F9      Quit
F10     Exit and Save
```

Figure 30 Choosing the "Protocol Settings" input screen in XconfigP.

```
HCL-eXceed Family - Configuration Utility   Version 4.2
Copyright (C) Hummingbird Communications Ltd. 1989-1991

Protocol Settings

Access modification     No
Allow R3 bugs           Yes
Suppress color errors   No
XDMCP kill clients      Yes
Trace initially on      No
Slow trace              No

F1 help                                   Esc main menu
```

Figure 31 The "Protocol Settings" input screen in XconfigP.

Once the steps shown in Figures 17 to 31 have been followed, the configuration of HCL-eXceed/W is complete and it should be saved to disc. This final step is illustrated in Figure 32.

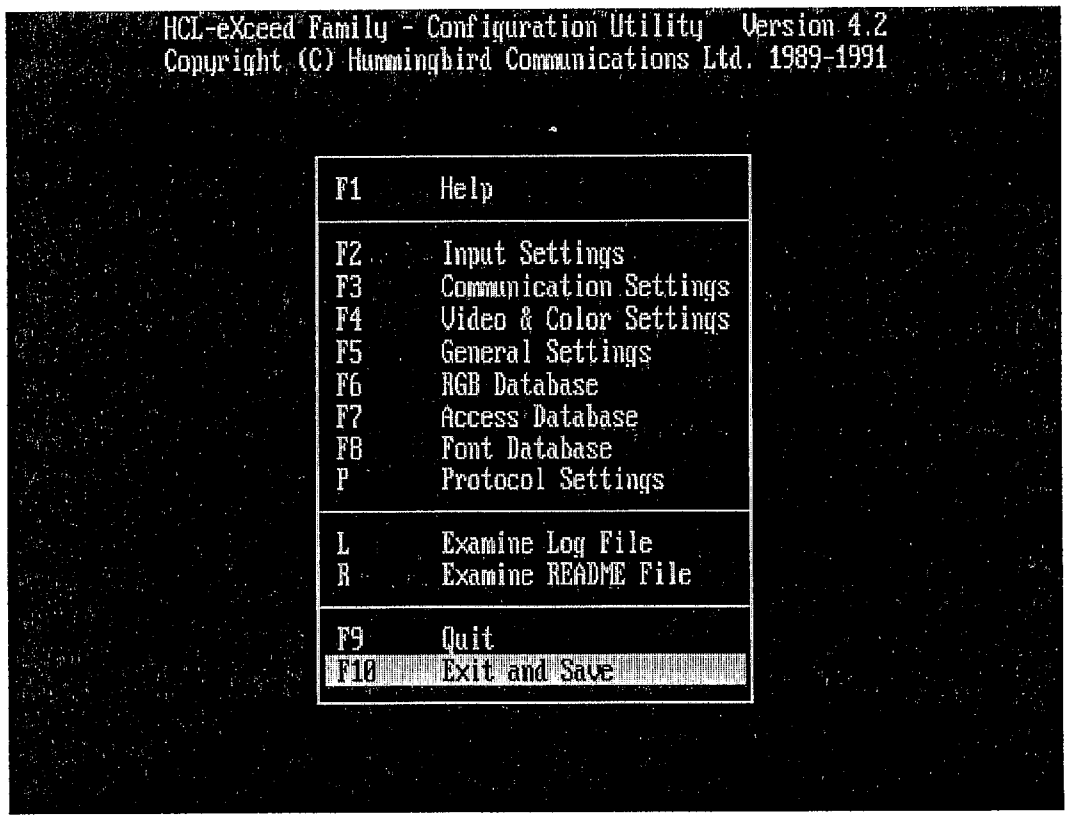

Figure 32 Saving the HCL-eXceed/W configuration and exiting XconfigP.

Using Xstart

Once the HCL-eXceed/W files have been installed and the program has been correctly configured, the next step is to create the necessary links to the remote UNIX hosts on BMRnet that are going to be accessed with X11 Windows. The Xstart program is provided for this purpose.

To run Xstart, double click on its icon in the HCL-eXceed/W Program Group (see Figure 16). The screen shown in Figure 33 will then appear. Fill in the entry fields as shown in the examples in Figure 33. The appropriate UNIX userid, user home directory and UNIX machine name should be substituted for the examples shown.

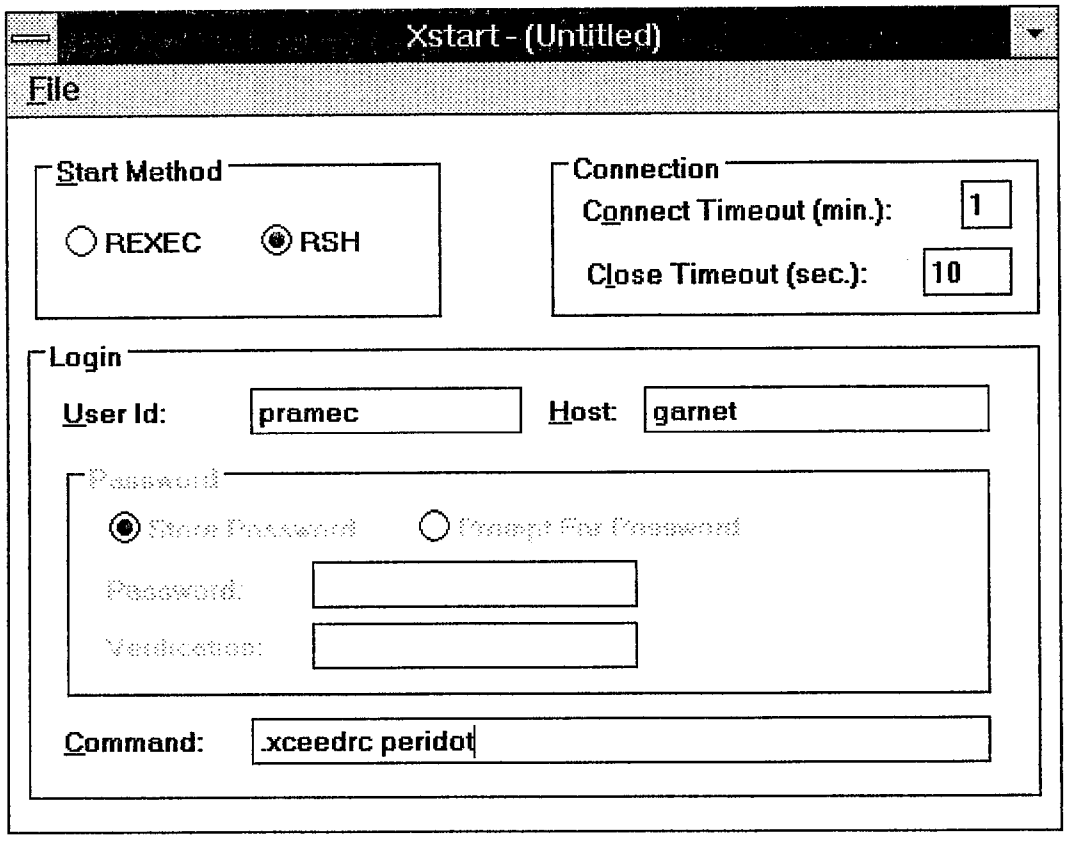

Figure 33 The opening screen of Xstart should have the entry fields filled in with equivalent entries to those shown here (see text).

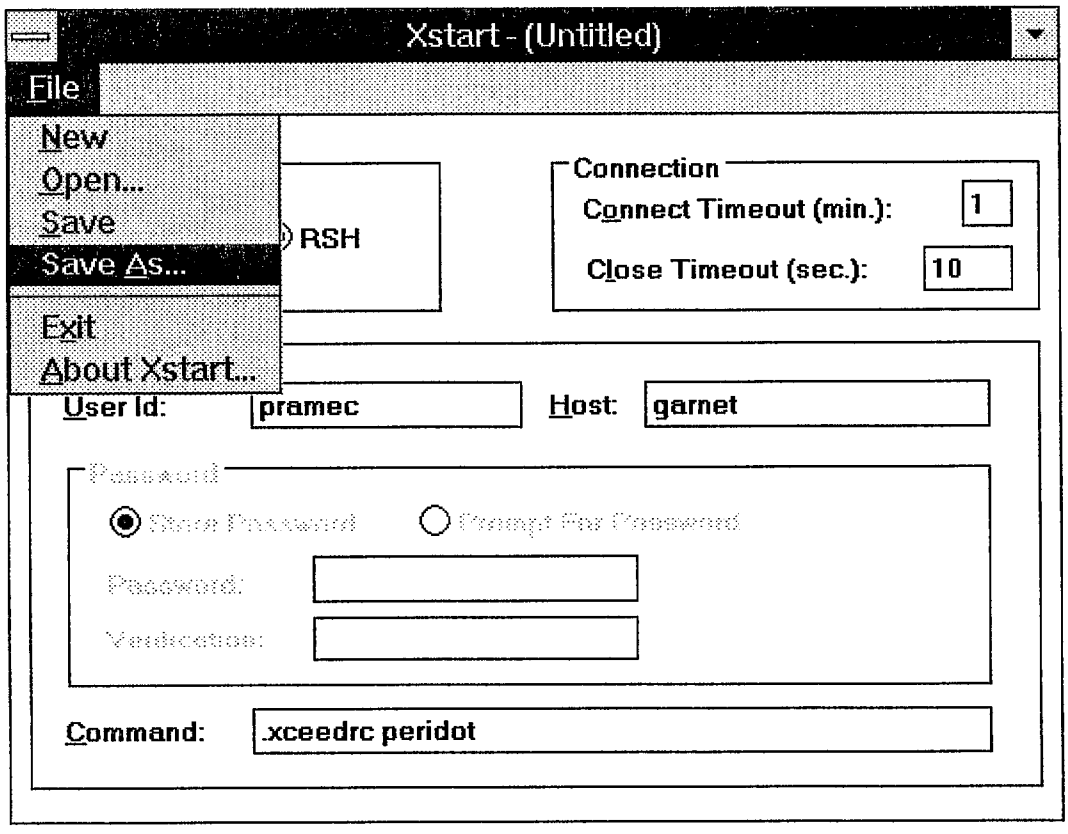

Figure 34 The completed Xstart screen should be saved using the SAVE AS option

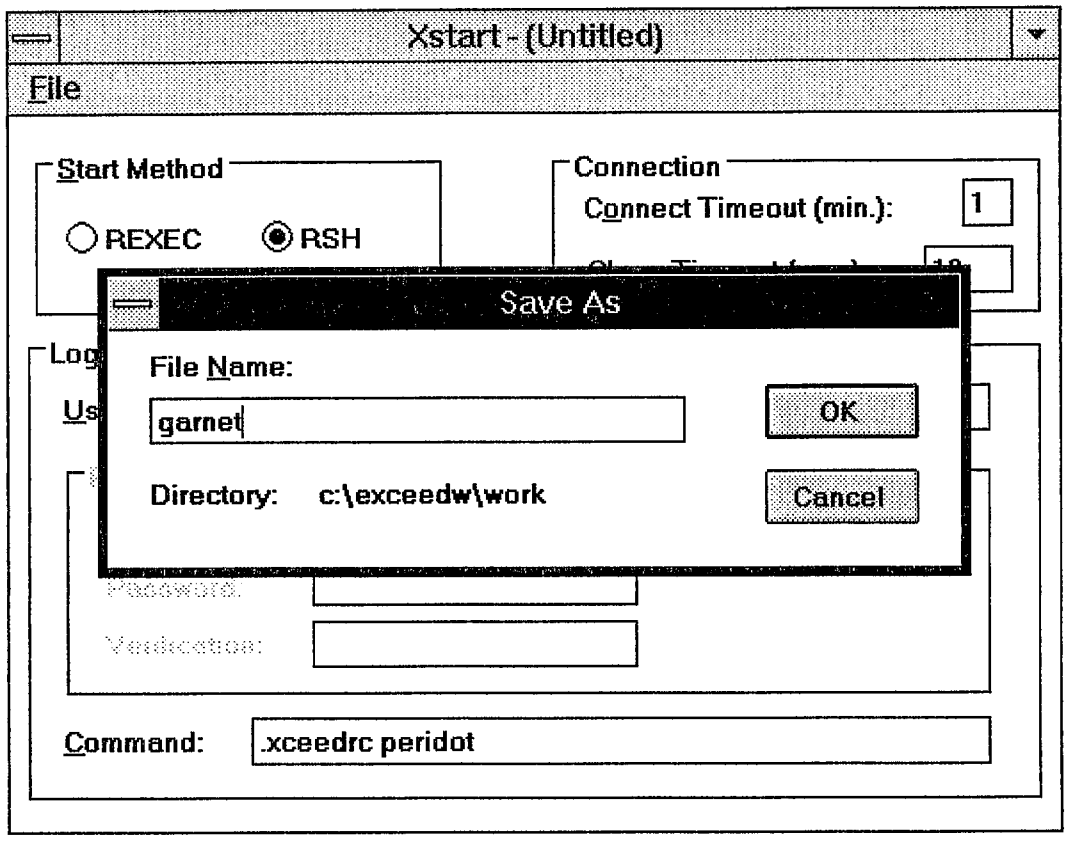

Figure 35 Save the Xstart data in a file named for the particular UNIX host.

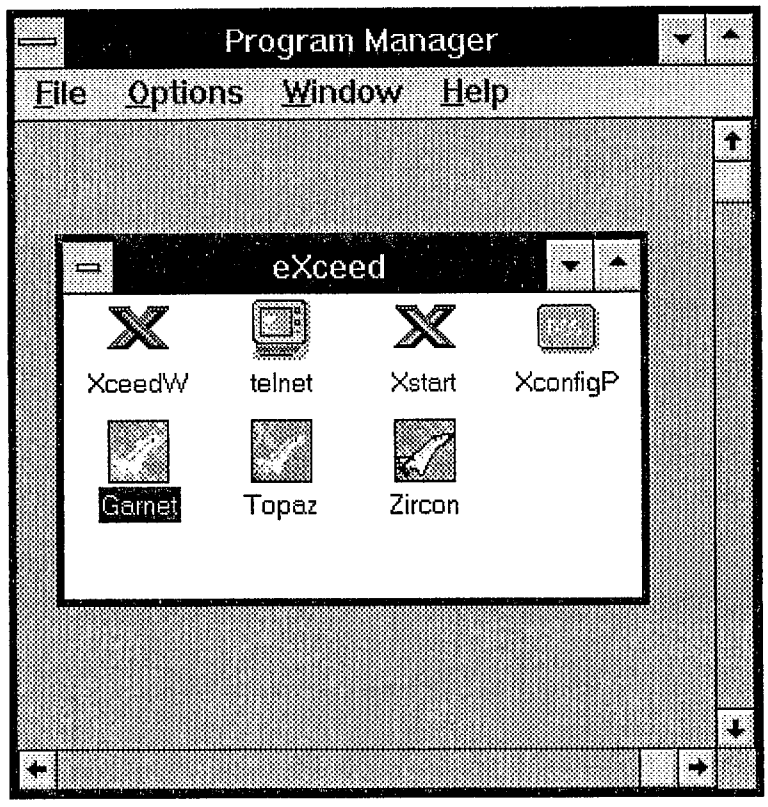

Figure 36 The completed HCL-eXceed/W Program Group with icons for three different UNIX hosts.

Setting up the UNIX Hosts

With the set up of the PC X11 server complete, the only remaining task is to set up the UNIX host or hosts that are going to be used with X11 Windows. Two files need to be added to the home directory (or made accessable from this directory) on each UNIX host. These files are called **.xceed** and **.xceedrc** and they should contain the following data:

.xceed

```
/mnt/pramec/.xceedrc $1 > /mnt/pramec/.xceed.errors 2>&1 < /dev/null &
```

The entry in **.xceed** should be changed from the example shown here so that it reflects the home directory of the userid that will be using X11 Windows.

.xceedrc

```
#
# the host name is the first argument
host=$1
DISPLAY=${host}:0
export DISPLAY

#
# set the resources
#
if [ -f $HOME/.Xdefaults ]; then
        xrdb $HOME/.Xdefaults
else
        xrdb $OPENWINHOME/lib/Xdefaults
fi
if [ -f $HOME/.Xresources ]; then
        xrdb $HOME/.Xresources
fi

#
# give all hosts access
#
xhost + > /dev/null

#
# create the login window
#
exec $OPENWINHOME/demo/xterm -geometry 80x24 -ls -name `hostname` -iconic &
```

Using HCL-eXceed/W

HCL-eXceed/W is now ready to be started. Reboot the PC in order to load the configuration and then from the eXceed/W Program Group, double click on one of the icons representing a UNIX host (e.g. garnet in Figure 36). As HCL-eXceed/W loads, firstly an X icon representing the program and then a second icon representing the X11 session on the chosen UNIX host, will appear at the bottom of the Microsoft Windows Program Manager screen. Double clicking on the latter icon will open the X11 session (e.g. see Figure 37).

Appendix A contains a detailed description of the HCL-eXceed/W X11 Windows server's specifications. A similar report can be generated for error checking purposes on new HCL-eXceed/W installations by using the UNIX **xdpyinfo** command (e.g. xdpyinfo -display peridot:0).

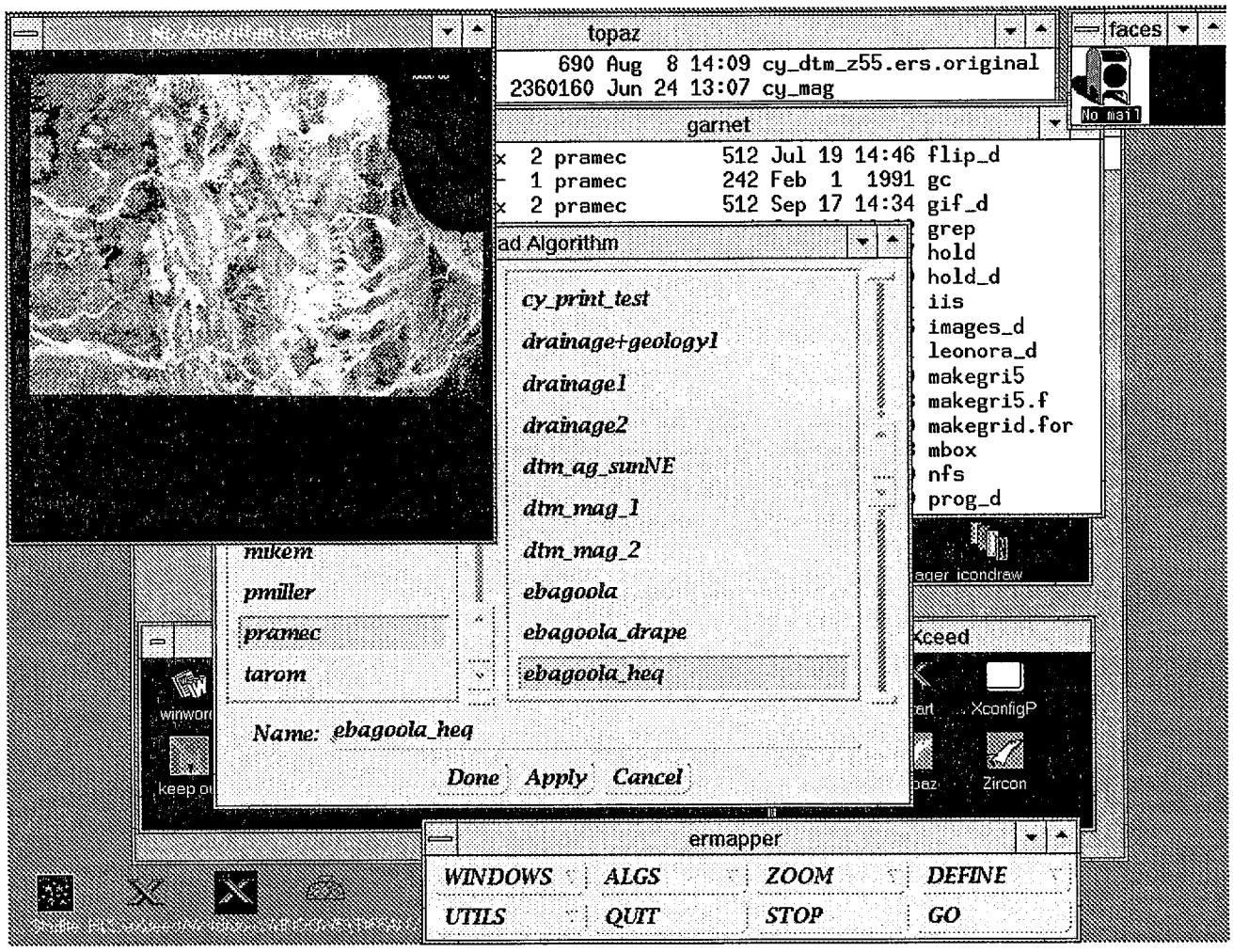

Figure 37 A screen captured during an X11 Windows session with HCL-eXceed/W and the ER Mapper image processing software. Note how multiple UNIX sessions can be viewed and worked with. Here sessions are open on the GARNET and TOPAZ SUN 4/280 fileservers.

HCL-eXceed/W performs very well once it is correctly configured in multiple windows mode (as has been described here). With the backing store option set to "when mapped" the contents of all visible windows (including ER Mapper images) are always preserved locally whenever another window such as a pop-up menu impinges. Once the obscuring window is removed (e.g. by closing it or by moving it), the underlying window is quickly and automatically repainted (Chopra 1991a). Similarly, any image window which is minimised to an icon and then is subsequently re-opened, does so with its image intact.

This type of functionality is essential when running applications such as ER Mapper and Arc/Info Rev. 6. ER Mapper, in particular, places many menus and image windows on the screen and the user is constantly having to shuffle from one menu or image window to another. By saving all obscured windows in local PC memory and updating the screen from this source, traffic over BMRnet is reduced and time consuming screen refreshes are minimised.

Conclusions

The procedures that need to be followed to install and configure the HCL-eXceed/W X11 Windows server (version 1.0) for Microsoft Windows (version 3.0) have been comprehensively described in this Record. It is hoped that new BMR users of HCL-eXceed/W will be able to use this Record to set up the software without having to rely heavily on expert assistance from Information Systems Branch and from BMR local area network administrators.

References

Chopra P.N. (1991a). PC X11 Windows Servers Providing Network Access to UNIX Graphics, Bureau of Mineral Resources, Australia, Record 1991/97.

Chopra P.N. (1991b). Distributed image processing using the RTI-CAD PC software package, Bureau of Mineral Resources, Australia, Record 1991/62.

Appendix A HCL-eXceed/W server specifications

```
garnet:pramec 60 % xdpyinfo -display peridot:0
name of display:    peridot:0.0
version number:    11.0
vendor string:    Hummingbird Communications Ltd.
vendor release number:    0
maximum request size:  4096 longwords (16384 bytes)
motion buffer size:  1
bitmap unit, bit order, padding:    8, MSBFirst, 16
image byte order:    MSBFirst
number of supported pixmap formats:    2
supported pixmap formats:
   depth 1, bits_per_pixel 1, scanline_pad 16
   depth 8, bits_per_pixel 8, scanline_pad 32
keycode range:    minimum 8, maximum 109
number of extensions:    2
   HCL-DOS-Access
   SHAPE
default screen number:    0
number of screens:    1

screen #0:
  dimensions:    1024x768 pixels (240x180 millimeters)
  resolution:    108x108 dots per inch
  depths (2):    1, 8
  root window id:    0x8006a
  depth of root window:    8 planes
  number of colormaps:    minimum 1, maximum 1
  default colormap:    0x80065
  default number of colormap cells:    256
  preallocated pixels:    black 0, white 255
  options:    backing-store YES, save-unders NO
  current input event mask:    0x1c0000
    ResizeRedirectMask      SubstructureNotifyMask   SubstructureRedirectMask
  number of visuals:    1
  default visual id:  0x80064
  visual:
    visual id:    0x80064
    class:    PseudoColor
    depth:    8 planes
    size of colormap:    256 entries
    red, green, blue masks:    0x0, 0x0, 0x0
    significant bits in color specification:    8 bits
```