Chain 64

Managers Guide

CHAIN 64 Managers Guide

PN 15694

Preface

CHAIN 64 is a powerful network system based on the
RML 480Z and RM Nimbus microcomputers. Up to 64
480Z stations can use the high performance of the advanced
16-bit Nimbus as server to obtain substantial improvements
in standard 8-bit networking.

This guide is designed to aid the manager of a
CHAIN 64 network to install, run, and manage the
network. It covers both new network owners and owners of
an 8-bit CHAIN network that is being upgraded to a
CHAIN 64 network.

For ease of use, the guide is arranged in modular form: ·

- "Network Components" gives details of the equipment
  that makes up CHAIN 64
- "Setting Up" shows you how to set-up the hardware and
  the software
- "Management Tasks" covers all the network security,
  file-handling, and maintenance jobs that are the
  responsibility of the network manager
- "Printing" provides extensive information about
  printers and printing on the network
- "Reference" includes details of RM products:
  the CONFIG utility; the Piconet system; upgrades
  and options for your network. The module also
  includes details of Concurrent DOS utilities and the
  BackRest (winchester back-up and restore) utility

Modules are split into chapters, and there is a contents
list at the start of each module. At the back of the
guide, there is an appendix that lists Concurrent DOS
errors and an index that covers the whole guide.

Contents

Chapter 1
Introduction

This Guide

This guide is organised in modules that categorize the manager's tasks.

This module tells you about the Nimbus and winchester and floppy disk drives attached to it. Details of the network cable and the 480Z stations are described.

In the Setting Up module, you learn how to set up the Nimbus server, how to install the software and how to set up and test 480Z stations. There are sections on the network software and on partitioning winchester disks.

The Management Tasks module outlines all the management jobs to be carried out to run and maintain a network.

The Printing module covers the setting up and use of printers on the network.

The Reference module covers some Research Machines facilities, upgrades and options, and includes some extracts from the Digital Research Concurrent DOS 4.1 User's Guide.

Security Warning – Lock This Manual Up!

Please note that this manual describes network management tools which, if misused, can seriously compromise the integrity and security of your network, We strongly advise you not to let unauthorized or inexperienced users have access to this manual. While CHAIN 64 makes network management easy for you, it also makes it easy for others if they know what to do!

CHAIN 64

This module lists the components needed to make up the CHAIN 64 network and the options that you can add. Details of how to set up and use the network are given in later modules.

The CHAIN 64 network is an enhanced network system based on the cost-effective computing power of the RML 480Z 8-bit microcomputer, and the advanced RM Nimbus 16-bit microcomputer with a winchester hard disk.

Because the system uses the tried and tested networking technology of RM CHAIN network, the new CHAIN 64 network is fully compatible with existing 480Z computers (stand-alone or in a network). Existing CHAIN network users who upgrade to CHAIN 64 get vastly increased power and flexibility. New customers are provided with a low-cost, high-performance, 8-bit networking system.

The Nimbus allows the use of versions of the latest Digital Research Concurrent DOS and DR-NET operating systems - we call them the CHAIN 64 operating system. This supports up to 64 stations, permits password protection of files, and includes date and time stamping of files (on creation, access and update).

Network Managers who are upgrading will notice easier maintenance as well as improved performance. CHAIN 64 allows the use of mixed 8-bit and 16-bit servers, so that an existing 8-bit server can offer disk and printer resources to the new network.

This introductory module has a section about the CHAIN 64 network followed by a section about the network manager's job. Later in this guide, there are modules covering each aspect of the job – for managers of both new and upgraded systems.

The CHAIN 64 Network

The CHAIN 64 Network consists of up to 64 480Z microcomputers (stations) that can communicate with a Nimbus master station (the server). The Nimbus has disk drives and printer resources that it shares between the stations by handling the input and output requirements of each station. A station carries out its own processing.

Stations can have access to larger storage devices and higher quality printers than they could have as stand-alone microcomputers.

The server and network stations are connected by coaxial cable so that signals can be transmitted between computers. This connection system is easy to set up, and it allows you to position the server and network stations wherever is convenient.

Always connect the server and stations in a line with a terminator at each end of the cable.
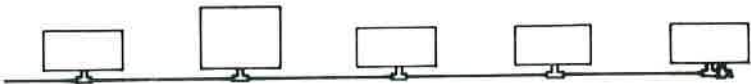
It does not matter where the server is positioned in this line.

Each computer on the network has a transceiver that can either send or receive a packet of information. When a transceiver issues a packet, it is broadcast on the coaxial cable and all the other transceivers detect it as it travels along the length of the cable in both directions.

Every packet has a destination code so that only one computer processes the information. The others ignore the packet and it is absorbed in the terminators at the end of

the cable. If the terminators are not there, the packet keeps reflecting back along the cable, getting in the way of other packets. This is why a ring of cable is not allowed.

Do not connect up the network with a branched cable. This would cause interference because the terminators would not be able to absorb reflections efficiently.
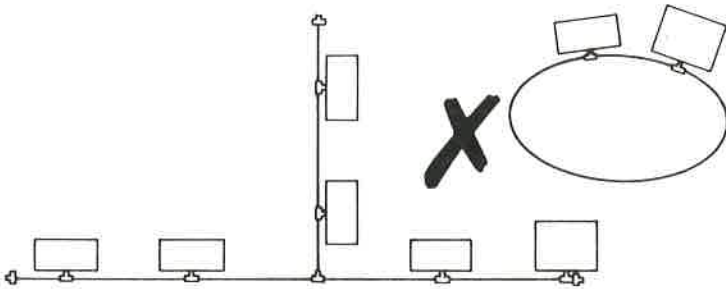
Whenever a computer wishes to send a packet, it checks that the cable is clear before starting to transmit. If two or more stations try to send a packet at the same time, a collision is detected by their transceivers, and they will stop transmitting.

Each station will start to send the packet again after an interval to reduce the possibility of another collision. The packet format and transmission mechanisms are based on those of Z-NET.

The broadcasting of packets and checking for collisions happens very quickly. The packets are up to 512 bytes of information plus a system header. They are transmitted serially between machines at 100 Kbytes/second.

The stations are run under the control of the Digital Research CP/NOS network operating system which provides access to network files and devices through the server.

The Nimbus server uses the CHAIN 64 multitasking operating system. It allows you to carry out network management tasks (or other operations) on the server while it is looking after station requests.

The CHAIN 64 Package

This guide is written for the CHAIN 64 network manager who has the job of setting up and managing the network. The accompanying CHAIN 64 User's Guide gives information about using a 480Z station on the network.

As well as the CHAIN 64 package, you will have received the "RM Nimbus Owners Handbook" and an MS-DOS system disk. These are *not* part of CHAIN 64. They allow you to use the Nimbus as a standalone machine running under Microsoft's MS-DOS operating system.

Because the RM Nimbus Owners Handbook refers to MS-DOS operation, do not consult it for CHAIN 64 operations except in two cases. When you are upgrading or adding options to the RM Nimbus, you will have to consult the "How To Take It Apart" module.

If you are making your own printer cable, you may need to consult the "Reference" module for details of socket connections.

Chapter 2
The Nimbus Server

Introduction

Your Nimbus microcomputer (with monitor and keyboard) must have at least one 3.5-inch floppy disk drive and at least one winchester hard disk (internal or external) to be a CHAIN 64 server. Also, it needs at least 576K bytes of memory.

The 16-bit Nimbus is based on an 80186 processor, VLSI gate array technology, dual bus architecture, and a separate graphics processor. Its features include two ROM Pack sockets and a software key socket. These particular features are not supported by the CHAIN 64 operating system but can be used when the Nimbus is acting as a standalone system under the control of the MS-DOS operating system.
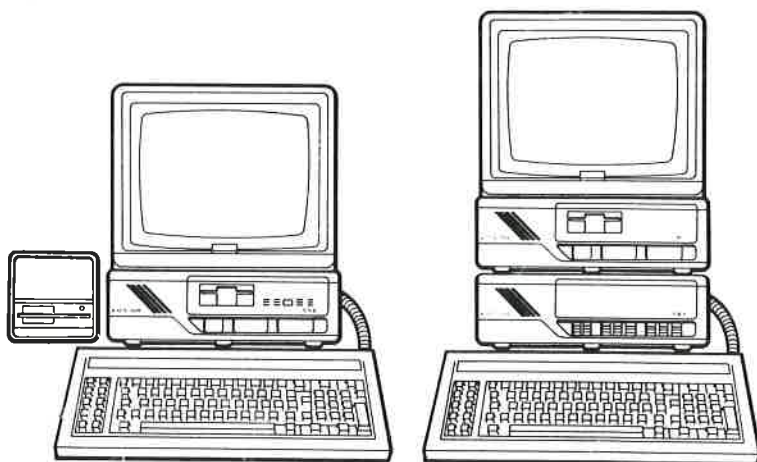
If you have upgraded an RML CHAIN network that is
equipped with a winchester disk, you will probably be
planning to connect this winchester to the CHAIN 64
Nimbus server.
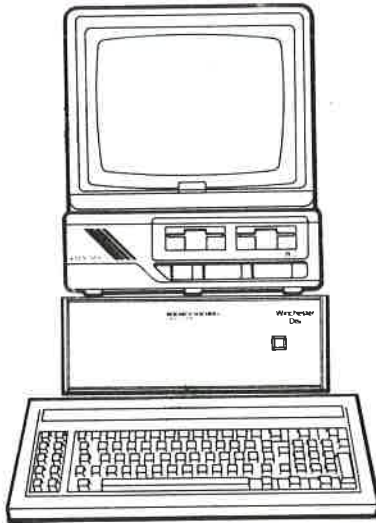
Software supplied both by Research Machines and other
software publishers, for use on CHAIN and
CHAIN 64 networks, will be supplied on 8-inch or
5.25-inch double-density disks. Consequently, your
CHAIN 64 network should have a 5.25-inch or 8-inch
floppy disk drive. This can be:

- a 5.25-inch double-density disk drive attached to the
  Nimbus

- a 5.25-inch double-density disk drive attached to a
  480Z station

- a 5.25-inch double or quad density or 8-inch double-
  density disk drive attached to a CHAIN network server

- do not hold the disk near any strong magnetic fields such as the screen of a colour monitor or TV (especially when switching it on or off), and electric motors (normally only a hazard if running)

The 3.5-inch disk can be protected from unwanted writing or file erasing operations by means of its write-protect hole. This can be covered by a small plastic slide on the underside of the disk.
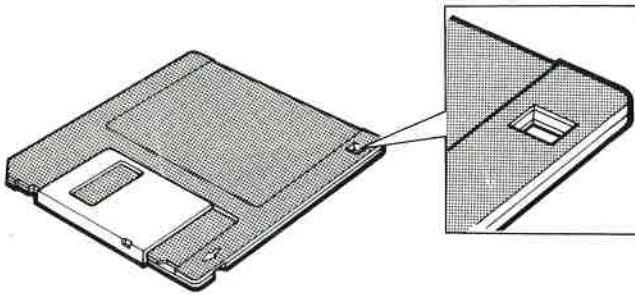
When the hole is open, the disk is write-protected and the contents cannot be changed. The hole must be closed if you want to add to or change the contents of the disk.

The 3.5-inch disks for use on the Nimbus can be obtained either from your Nimbus supplier or directly from Research Machines.

Winchester Disks

A winchester disk is a hard disk (as distinct from a floppy disk) that is sealed inside a container and placed inside the Nimbus or in a separate unit. So, you cannot see the winchester, but you can tell that it is present by the markings on the unit:

- a Nimbus with a 3.5-inch disk drive and a built-in (or internal) winchester has an X in its name – XN16, for example

- an external winchester in a Nimbus-style case has XW in its name – XW40, for example

- a winchester in a 380Z-style case has "Winchester Disc" written on the unit

The winchester disk uses a stack of coated aluminium disks, or platters, providing several surfaces, each with its own read/write head. The platters are sealed to prevent particles of dust, smoke, and so on from entering between the disk surfaces and the read/write heads.

In operation, the disk is much faster than floppy disk drives, giving you a noticeable improvement in the time required to load system and application programs.

The storage capacity is much greater than that of floppy disks, providing Megabytes of storage on a single disk rather than Kilobytes (1 Megabyte is 1 million bytes, or characters, of data). The CHAIN 64 Nimbus server can support up to four winchester disks (see "Upgrades and Options").

The CHAIN 64 operating system allows you to partition the space available on winchester disks into smaller and more manageable "logical drives". CHAIN 64 allows you to create and use up to eight logical drives on up to four physical winchester disks.

Monitor
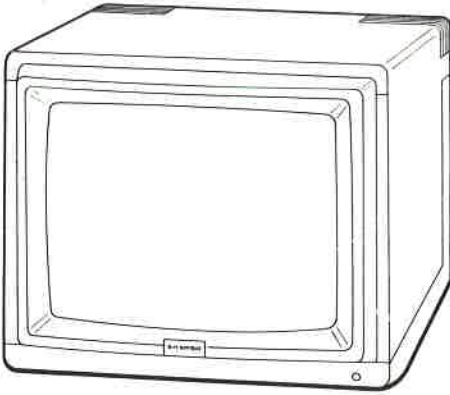
Nimbus Monitors

If you purchased a display monitor from Research Machines for use with Nimbus, it will be one of these types:

- Monochrome, high resolution, with a 12-inch screen

- Colour, low resolution, with a 14-inch screen

- Colour, medium resolution, with a 14-inch screen

- Colour, high resolution, with a 14-inch screen

It is likely that you will be using a monochrome monitor as the extra expense of a colour monitor is not necessary on the server.

Installation and setting-up instructions are included with every monitor supplied by Research Machines. The usual controls are on/off, brightness and contrast. The on/off switch should be left on if the monitor mains cable is connected to the computer unit.

Colour monitors are capable of displaying the 16 colours of the IRGB range implemented in Nimbus. The colours appear as different shades on a monochrome monitor.

Other Monitors

Monochrome monitors not supplied by Research Machines will work normally when connected to a Nimbus. Colour monitors (both the 8-colour RGB and 16-colour IRGB varieties) that were not supplied by Research Machines for use on a Nimbus may have input signal requirements that do not match the output signals from the Nimbus colour monitor socket.

On delivery from Research Machines, the output signal from Nimbus conforms to the "positive separate sync" standard. You can switch this signal to give an alternative "negative mixed sync" signal that will allow the use of colour monitors from 480Zs.

There is a small switch located on the main board which is accessible from outside the case by using a narrow-bladed screwdriver inserted through the fifth ventilation slot from the rear on the righthand lower side of the machine.

The switch is set in the up position upon leaving the factory. To change the signal characteristics, reset this switch to the down position. Very early models of Nimbus need to have their case-tops removed as this switch is accessed from above.
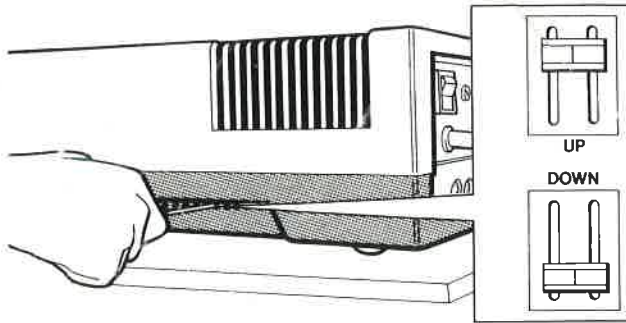
If you are ordering a colour monitor from a source other than Research Machines, it should meet the specification outlined in the section on monitors in the "Optional Extras" module of the Owners Handbook.

Keyboard
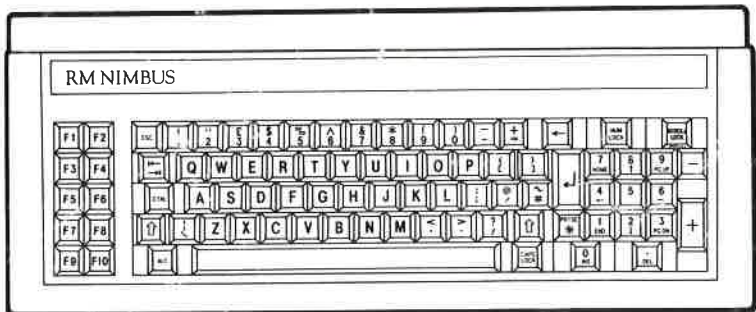
The keyboard has three different areas: the typewriter area, the function keys, and the numeric keypad. Most of the keys are *auto-repeat* keys; that is, if you hold them down, they will repeat their character or function. The auto-repeat may be set on or off by the configuration memory – see the reference module.
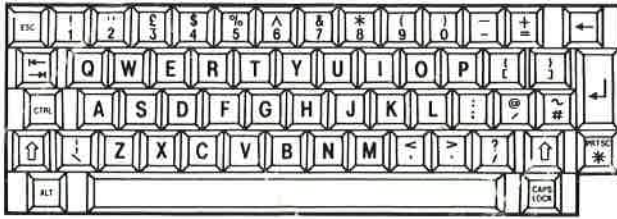
The keys in the typewriter area are very similar to those on a normal typewriter. The alphabetic and numeric keys are identical, but the symbol keys have some differences. There are several additional keys, called control keys, that have special purposes.

When you press a character key, the keyboard transmits the character inscribed on the key to the Nimbus processor. Alphabetic keys normally provide the lower-case version of the character on the key and non-alphabetic keys provide the lower of the two characters inscribed on the key.

To obtain upper-case (capital) letters and the remaining characters, use the Caps Lock and Shift keys described below.

Usually, the character of the pressed key will be displayed immediately on the monitor. Sometimes, programs cause delays between pressing a key and screen display.

The Space Bar sends a "space" character to the processor and normally moves the cursor one position to the right. The cursor is the white rectangle occupying the character space where the next character to be typed will appear.

Notice that Nimbus recognizes a space as a definite character and it is stored as such. It is not the same as on a typewriter where a space is the absence of a character.

The Caps Lock key changes the characters sent by the alphabetic keys from lower case to upper case when pressed once. It changes characters back to lower case when pressed again (a toggle key).

The non-alphabetic keys are unaffected by the use of the Caps Lock key.
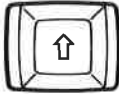
There are two Shift keys, one at each end of the first row of character keys. They act on all the character keys.

When either of the Shift keys is held down, each alphabetic character will be sent in the other case from that set by the Caps Lock key and each non-alphabetic key will send the upper of the two characters shown on the key.

You can get lower case characters while Caps Lock is in upper case mode by holding down the Shift key.

The Escape key has functions defined by the program you are running. It is not necessarily the emergency way out!
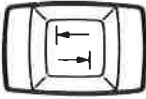
When you press the Tab (tabulator) key the cursor moves to the next defined tab stop. See the manual of the program being run for the definition of the tab stops.
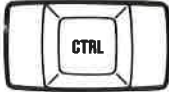
The Control key is used in conjunction with another key to perform a control function. Details of the functions under the CHAIN 64 operating system are given in chapter 4 of the Reference Module.

Because there is no reset switch on the Nimbus, the ALT (Alternate) key is used to reset the Nimbus in conjunction with the Control key and the Delete key at the bottom of the numeric keypad. In the manual, this combination is written as <CTRL/ALT/DEL>.
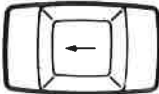
The Backspace key usually erases the character to the left of the cursor and moves the cursor one character position to the left. This is *not* the DEL key.

If the function keys are used, they are defined by the program that you are running. For example, RM utilities use function keys when in menu mode.
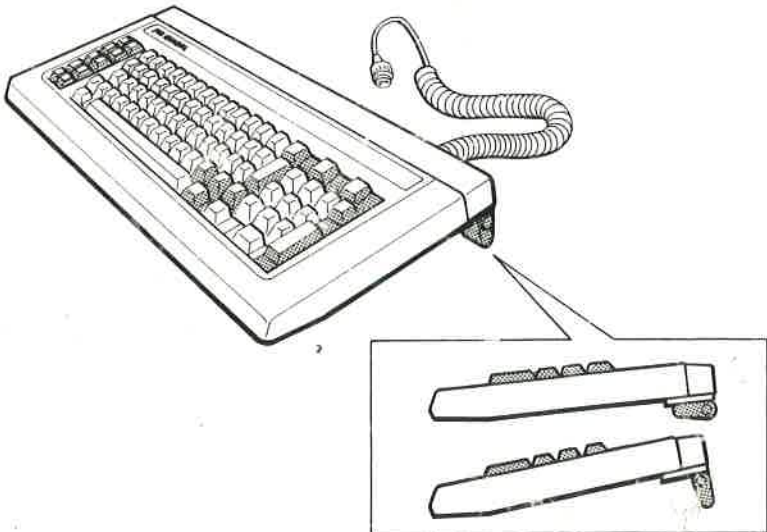
The angle of the keyboard can be changed by using the two legs at the back. When the legs are folded up, the keyboard will lie flat. When the legs are down, the keyboard will be at the normal typing angle.

5.25-inch Floppy Disk Drive

This specially designed 5.25-inch disk drive can be attached to your Nimbus server to allow transfer of files from 5.25-inch disks. This disk drive reads and writes double-density disks only. It cannot be used for single-density or quad-density disks. Details of how to fit and use the drive are provided with it.

**Write-Protect
Notch
(shown covered)**
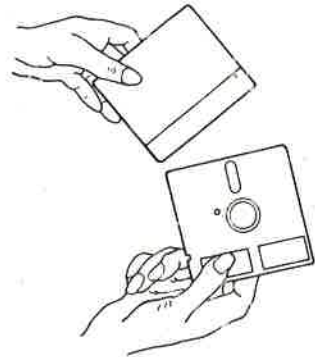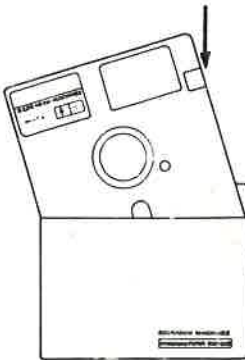
With this type of disk, the write-protect notch in the sleeve is covered to prevent the contents being changed.

Research Machines does not supply standard lengths of this cable. RS Components supply low-loss cable and connectors that are suitable for use with the network. Part numbers are given in "Making a network cable".

Mixed standard and low-loss cable

It is possible to have a mixture of the two types of cable in a single network system. This gives the advantage of a longer network without the higher overall cost of a complete low-loss cable network.

However, the total end-to-end cable length must not exceed the equivalent of 300 metres of standard cable.

To help you, here is a simple method. One metre of standard cable is equivalent to four metres of low-loss cable. So, by dividing the total length of low-loss cable by four you get the equivalent length of standard cable.

For example, it is possible to install a network with 600 metres of low-loss cable and 100 metres of standard cable:

600 m of low-loss cable / 4 = 150 m of standard cable

Total equivalent standard cable length = 150 + 100 = 250 m

This is within the maximum permitted length (300m).

Making a Network Cable

If you need non-standard lengths of cable, or if you need to use low-loss cable, this section is a guide to the components that you will need.

For standard cable, the components listed below, available from RS Components are suitable for making your own lengths of cable.

Any other components may make the operation of the network unreliable. We recommend "crimp" type BNC connectors, in preference to the solder-on type, for consistently good connections:

- 50 ohm RF cable (Uniradio No. M43), RS part no. 388-237 (100m Reel)

- BNC crimp connector 50 ohm plug, RS part no. 456-352

- Crimping tool for above, RS part no. 456-431

- BNC "T" piece 50 ohm, RS part no. 455-832 (one required per station and server)

- BNC barrel connector 50 ohm, RS part no. 455-977

- BNC 50 ohm terminator, RS part no. 456-251 (two required per network)

Low-loss cable uses solder-on connectors rather than the "crimp" type:

- 50 ohm low-loss cable (Uniradio No. M67), RS part no. 388-142 (50-metre reel)

- "N" series 50 ohm plug, RS part no. 455-753

- "N" series 50 ohm free socket, RS part no. 455-775

- "N" series 50 ohm plug, RS part no. 455-949 (allows standard cable to be connected to the low-loss "N" series connectors)

- "N" to "BNC" series 50 ohm connector, RS part no. 456-043 (allows "N" series low-loss cable connectors to be plugged into male "BNC" series standard cable connector)

The 480Z Station
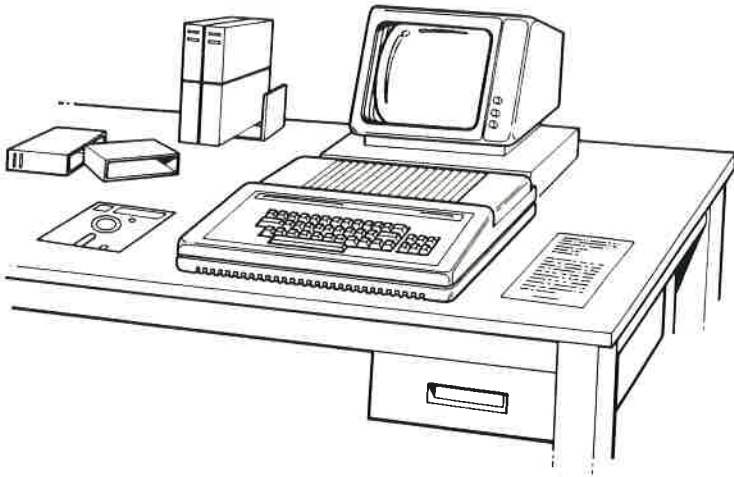
The 480Z network station has 64K of main memory and an
optional high resolution graphics facility.

It may also contain a "silicon disk". This is a number of
additional RAM integrated circuits that behave as though
they were a disk storage device providing 174K of usable
extra space, for holding files.

Connecting the station to the network is covered in
"Setting Up".

A 480Z 5.25-inch disk drive (but *not* a Nimbus 5.25-inch
disk drive) can be attached to a station and used as a
local disk drive with access to the network facilities.
This is explained in chapter 7 of the Network Users Guide.

Also, each 480Z network station can be used as a stand-
alone computer with a 5.25-inch disk drive. Details are
provided in the manual: "LINK 480Z Disc System Users Guide
(revision 1)".

A
B
C } winchester disk partitions
D

E   lefthand 3.5-inch disk drive (both sides of disk)

F   righthand 3.5-inch disk drive (both sides of disk)

G   5.25-inch floppy disk drive (top side of disk)

H   5.25-inch floppy disk drive (bottom side of disk)

I
J
K } winchester disk partitions
L

M   Nimbus silicon disk

N
O } reserved for system use
P

These are the default logical drive names that are given to the available physical drives every time you switch on the Nimbus. These names allows you to specify the required drive easily in operating system commands or program commands.

The current drive is shown by the system prompt, for example:

A>

You can change to another drive by typing the drive letter followed by a colon. For example:

E:<ENTER>

causes a change to the E> prompt, indicating that the lefthand 3.5-inch disk drive is the current drive.

Because a winchester disk has a large capacity, you can partition it – divide it into several partitions, each with a different drive name. You can have up to 4 logical drives on each physical winchester disk and up to eight logical drives distributed over two or more winchester disks. This makes file management easier.

For example, you may partition your winchester disk into drive A containing system files, drive B containing data files, and drive C containing office administration files.

Station users can reassign any of the above logical drive names to different physical drives if they want. As you will see later, this can be very useful if you have more than one server on your network.

Setting up

The setting up procedures are the same whether you have purchased a completely new CHAIN 64 system or you are upgrading a CHAIN network. The order of operations is:

1. Set up the server and winchester.

2. Copy the network software from the 3.5-inch distribution disks to drive A on the winchester.

3. Connect the server and winchester to 480Z stations and test whether they work.

The rest of this chapter deals with the first step, chapter 2 covers the second one, and chapter 3 covers step 3.

The Server

This section assumes that your Nimbus meets the CHAIN 64 server requirements described in chapter 2 of this module. If it does not, carry out the necessary upgrades.

Choose a suitable table for your Nimbus server, and put the computer unit towards the back of the table with its front panel facing forwards. Put the monitor on top of the computer unit and place the keyboard on the table.

Ensure that the screen of your monitor does not overhang the front of the computer unit. The strong field generated at the screen (particularly by a colour monitor) could corrupt data on the disks unless they are protected by the built-in screening.

Check that the mains switch on the rear panel is in the off (down) position. Then, leaving the mains plug until last, connect up your system as shown in the following diagram:
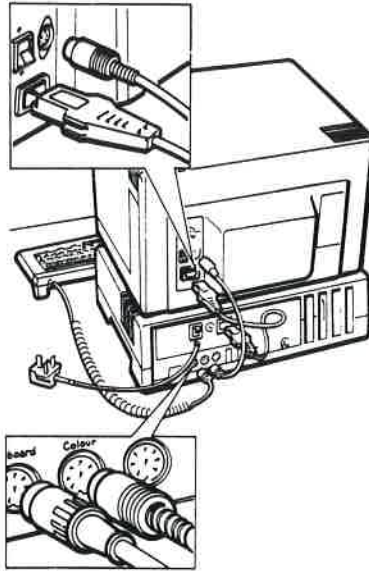
Colour monitors connect to the socket marked "colour", and monochrome (black and white) monitors to the socket marked "mono". Switch on the mains switch on the rear of your monitor.

Plug the colour monitor's power lead plug into the auxiliary power socket on the back of the Nimbus.

Some monochrome monitors supplied by Research Machines may not be fitted with a mains plug. A plug to fit the auxiliary mains socket on the rear panel of the computer unit is supplied.

If the moulded plug supplied on the mains lead of the computer unit does not fit your mains socket, it must be cut off and an appropriate plug fitted. It is hazardous to keep the plug that has been cut off: please throw it away.

The keyboard cable may be tucked under the side of the computer unit for neatness.

If you have a 5.25-inch disk drive, connect it to the Nimbus, using the fitting instructions provided.

An External Winchester

If you have an external winchester disk drive, it may be stacked either underneath the computer unit or between the computer unit and the monitor.

Connect the winchester cable as shown in the following two diagrams. The first shows the connection of an external winchester in a Nimbus-style case, and the second shows the connection of an external winchester in a 380Z-style case:
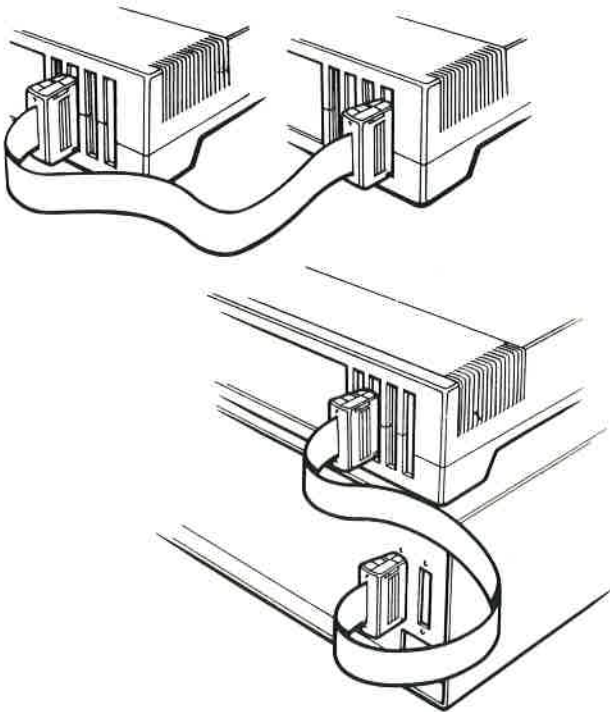
Ensure that the mains switch at the back of the crate is switched off, and plug the power cable into the mains at one end and into the winchester crate at the other.

Setting Up New Systems

If you are using a winchester that was previously used with an 8-bit CHAIN server, skip to the next section. If your winchester has been used previously with MS-DOS, skip to the section called "Setting Up With An MS-DOS Winchester".

When your system is connected up properly, switch on the Nimbus and external winchester (if you have one). On both types of unit, the main power switch is a rocker switch on the rear panel. When this switch is up, a green indicator lamp at the right of the front panel lights up.
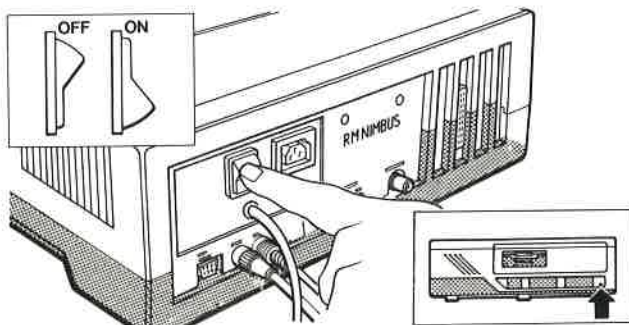
green indicator lamp

The Concurrent DOS operating system is loaded automatically from the factory-prepared winchester disk, and the start-up message is displayed on the Nimbus's monitor.

At the bottom of the screen, you will see the A> prompt, showing that the current drive is logical drive A on the winchester.

The system is now ready for you to copy the contents of the two 3.5-inch software distribution disks supplied with CHAIN 64. These are labelled "CHAIN 64 System Disk" and "CHAIN 64 Utilities Disk". They need to be copied onto drive A (on the winchester disk).

When the operation is successfully completed,
MODWINI informs you of this and asks you to press
any key to reboot. Do this, and the operating system will
be reloaded, this time without the error message.

Now, you have to make partition A of the winchester
bootable so that the Nimbus will automatically boot from
this drive whenever you switch on in future.

You use the HARDDISK utility to convert drive A to
a bootable drive. Type:

`E:HARDDISK<ENTER>`

The HARDDISK main menu will be displayed. Press the F2
function key, and the Activity menu appears. Now press F2
again, and you will see the Partitions menu.

You want to alter the boot partition, so press F8. The
current partitions and their sizes will be displayed.
Below the table, you will be asked which partition you
want to make bootable in terms of partition number.
Number 1 corresponds to partition A so type:

`1<ENTER>`

You will be returned to the Partitions menu. Press F9 to
leave HARDDISK.

If you have backed-up all files, you can, at this point,
use the HARDDISK utility to change the partition
sizes before copying the new software. See chapter 4 in
this module if you want to do this.

Now copy the contents of the two 3.5-inch software
distribution disks to drive A of the winchester, firstly
the CHAIN 64 Utilities Disk which is currently in
drive E:

`E:PIP A:=E:*.*[ROW]<ENTER>`

then replace the disk with the CHAIN 64 System Disk and repeat the above command.

Note: As there will probably be a number of files already on drive A from the previous use of the network, we suggest that you copy all the user 0 DIR files to another drive (or user number) using PIP *.*, then delete the old drive A, user 0 files.

Now, to check that all is well, take out the floppy disk(s) and reset the Nimbus – by switching it off and on, or by pressing <CTRL/ALT/DEL>. The operating system should be loaded from the winchester without the error message, and you should be promped for the date and time.

If you do not have a serial Piconet module, it is important that you enter the correct date and time each time that you switch on. The reasons for this are explained in later modules.

Setting Up a Second Server

You may intend to use the CHAIN 8-bit server as a second server on the CHAIN network. For example, you may want to read from or write to 5.25-inch or 8-inch disks, or you may want to print files with an existing printer attached to the old server.

If you have moved a winchester disk from the old server to the new one, you will need to ensure that the system disk containing the floppy-disk version of the CHAIN operating system (MP/M II) is available with the appropriate programs.

Also, your network users need to understand the new drive naming that will apply. Floppy disk drives that were drives E to H become drives A to D.

- press F9 to leave the utility and the system will automatically load Concurrent DOS from the 3.5-inch disk (since the operating system has not yet been copied to the winchester)

Now you can copy the files from the Utilities Disk to drive A of the winchester with:

`E:PIP A:=E:*.*[ROW]<ENTER>`

then replace the disk with the System Disk and use the same command to copy the files from the disk.

Now, to check that all is well, take out the floppy disk(s) and reset the Nimbus – by switching it off and on, or by pressing <CTRL/ALT/DEL>. The operating system should be loaded from the winchester, and you should be promped for the date and time.

Network Server Address

Your Nimbus needs a network address when it is used as a CHAIN 64 server. Use CONFIG to set an address. Type:

`CONFIG<ENTER>`

The screen will be filled with a menu that gives the CONFIG options. Also, it tells you which function key to press to select an option. Press the F8 Function key to select network parameters and a different menu will appear, showing a network server address value.

We recommend that you set the network server address in the range 144 to 159 decimal (90 to 9F hexadecimal), but you can use any address in the range 1 to 254 decimal (01 to FE hexadecimal) as long as it is a unique address on the network.

If you want to change the displayed address, press the F2 key and type in the decimal number followed by <ENTER>. Leave CONFIG by pressing the F9 key and the F2 key. The address is not changed until you reset or switch off.

You can find out more about CONFIG in chapter 1 of the Reference module.

Chapter 3
Setting Up A New Network

This chapter covers planning considerations, setting up
and testing of stations, and setting station addresses.
It is intended to guide you when you install a new
CHAIN 64 network and later (if you extend it).

Planning

When planning network layout, you should remember that:

- all stations should be placed where the 480Z keyboard
  and screen are easily accessible

- the server and stations should have adequate
  ventilation. As with all computers, they must be
  protected from extremes of temperature and from other
  likely hazards

- the location of mains sockets needs consideration so
  that a number of machines can share the same mains
  socket

- enough room should be available for station users to
  work comfortably. There should be room for
  additional equipment

The Network Cable

There are some important considerations concerning the
cable. The network cable and connections are fully
covered in the Components module. This section
considers how cable affects network planning.

Do not route the cable where it might be damaged or where people might trip over it. Where possible, arrange the cable in trunking along a wall so that it remains out of harm's way. If it is necessary to route it across floor space, make sure there is adequate protection.

Arrange the cable so that it does not branch, to avoid problems in signal transmission. For example, you cannot use a "T" piece to connect more than two lengths of cable. The server can be connected at any point along the network cable.

Total cable length must not exceed either 300 metres with standard cable or 1200 metres with low-loss cable. If you mix cables, remember that four metres of low-loss cable counts as one metre of standard cable (towards the maximum of 300 metres).

Setting Up a 480Z Station

Much of this section can be skipped if you are upgrading your network. In this case, you are advised to change the name of the BOOT.SLV file on the 8-bit CHAIN network server to NOTBOOT.SLV (so that stations will log onto the new server). Then switch off the network and connect the Nimbus server anywhere in the chain. Switch on the new server and the network, and see if the stations will log onto it.

For new owners, the procedure includes the installation of a VDU (T.V. or monitor), which is the same for all stations on the network.

Refer to the following figure (the 480Z rear panel) for guidance:
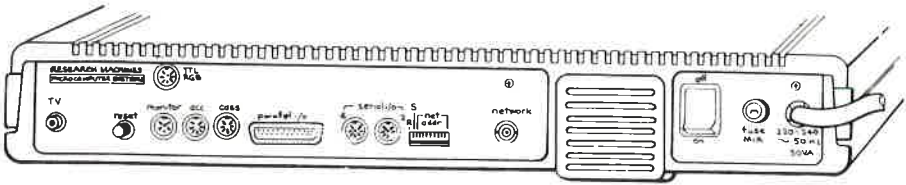
Connecting the Monitor

The monitor can be a monchrome or colour monitor, or a domestic television set. The cable connections to the 480Z are different in each case.

A black and white (monochrome) monitor is supplied with a cable:

- connect one end of the cable to the VIDEO IN socket at the rear of the monitor

- connect the 6-pin DIN plug at the other end of the cable to the MONITOR socket on the rear panel of the 480Z

A colour monitor is supplied with a separate TTL/RGB cable:

- connect the 6-pin DIN plug to the INPUT socket on the rear of the monitor

- connect the 8-pin DIN plug to the TTL/RGB socket on the rear panel of the 480Z

Most monitors have a switch on the rear panel marked Hi-Z (or High)/75 Ohm. Set this switch to 75 Ohm *unless* you intend to connect more than one monitor to the 480Z. If you connect more than one monitor, only the last in the chain should be set to 75 Ohm and the rest should be set to Hi-Z.

A television set (black and white or colour) is supplied
with coaxial cable with a plug at each end. A colour
television with TTL/RGB facilities should have
been supplied with a cable with a plug appropriate for
connecting it to the 480Z:

- connect one end of the cable to the aerial socket of
  the TV set

- connect the other end to the TV socket on the rear of
  the 480Z

Next, connect the 480Z and monitor to the mains and
make the network cable connection between the 480Z and the
server:

- make sure the mains on/off switch at the rear of the
  480Z is off

- plug the mains cable of the 480Z and the mains cable
  of the monitor into the mains power socket, mains
  adaptor, or extension lead

- connect a "T" piece to the "Network" connector on the
  rear of the Nimbus server. Attach a length of network
  cable to one socket of the "T" piece and a terminator
  to the other socket

- connect a "T" piece to the network interface socket on
  the rear panel of the 480Z (marked "Network")

- connect the length of network cable already attached
  to the server to the "T" piece using the BNC male
  connector

● connect a terminator to the other end of the "T" piece
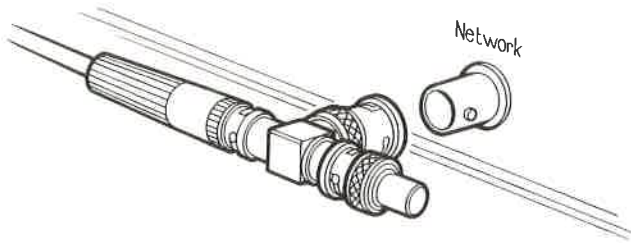
Switching on a 480Z Station

The procedure for switching on a station is:

● confirm that all connections are correct

● switch on the monitor and allow a few seconds for it
to warm up

● switch the mains on/off switch of the 480Z to the ON
position

A start-up message should be displayed:

```
RML 80 Character LINK 480Z              V1.2x
Z-NET Firmware Vers 1.1x          Address xx


To start BASIC in ROM type the command R

Please give a command or type H for Help.
```

The message confirms that the network firmware
(Z-NET) is present in the station.

If you are using a television set, adjust the tuning
control until the start-up message is clearly visible.
Channel 36 is the frequency used.

Testing the Station on the Network

Having followed all of the above procedures for setting up the station and server, you must check that they will operate correctly on the network.

- Press N

The screen display should give the message:

```
booting ...
```

and shortly afterwards the display should change to:

```
RESEARCH MACHINES
56K CP/NOS 1.2x

A>
```

This indicates that the station is correctly connected and logged into the network. The prompt "A>" means that the station is ready to accept keyboard commands.

If an error occurs during this procedure, an error message will be displayed. These messages are described in the Users Guide, together with any appropriate action you should take to correct the error.

Before you connect and test the next station, you must set up the station address using the switches on the rear panel of the 480Z. The section below, called "Setting a Station Address", shows you how to do this.

You may get error messages displayed on the station screen while setting up. These usually indicate faulty or incorrect cable connections.

Connecting more Stations

This is the procedure for setting up the next station:

- switch off the network

- set up the next 480Z and monitor and attach a "T" piece to the 480Z network socket

- set the network address of the 480Z

- remove the terminator from the "T" piece of the previous 480Z

- connect a length of cable from this "T" piece to the "T" piece of the new 480Z

- connect the terminator to the other end of the "T" piece of the new 480Z

Now you can switch on the network and test the new station with the same procedure as above. Add further stations in the same manner, but remember to put the terminator on a new station and to set its address before testing.

When setting up of the network is complete, a terminator must be connected to the "T" piece of each of the computers at the end of the cable.

Setting a Station Address

Each station on the network must be given a unique address to allow messages to be sent to it on the network. This address is set on a switch module on the rear of the 480Z station. Look for a row of small switches marked "net.addr." as shown in the following illustration:
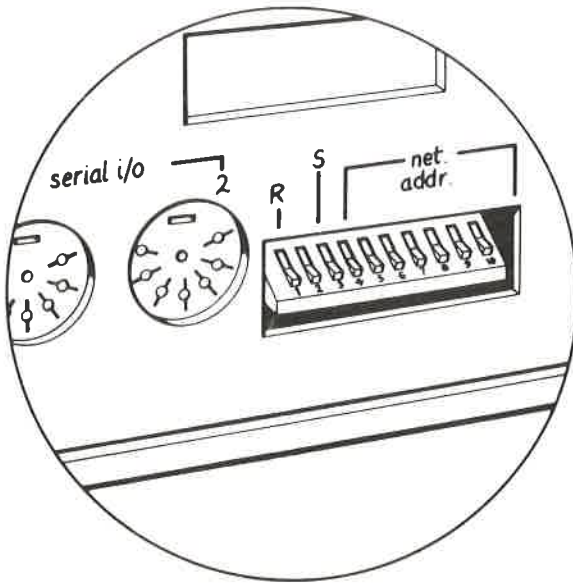
The switches are numbered 1 to 10, and the network address switches are those from 3 to 10 inclusive – the right-hand eight switches as you view the rear of the 480Z.

Each switch can represent a value of 0 or 1 depending on whether it is in the "up" or the "down" position:

Switch up   = 1
Switch down = 0

With eight switches, we can have many combinations of 0 and 1. These combinations are best thought of as a hexadecimal number – two groups of four binary numbers.

Each group of four can represent 0 to 15. These are represented in the hexadecimal system by 0 to F, as shown below:

HARDDISK<ENTER>

the main menu is displayed. This menu displays the logical drives associated with each partition present on each of the winchester disks connected. The key "F2" shows the first winchester, F4 shows the second, F6 the third, and F8 the fourth, when these are present.

When you press the function key that corresponds to a winchester present on the system the activity menu appears. Press F2 to reveal the "control partitions" menu. This menu allows you to select an operation you want HARDDISK to perform. Press F2 again to see the current state of the partitions after any operation has been carried out.

Sizes of partitions are given in sectors, and one sector is 0.5K bytes. Here are some translations to help you:

```
 600K bytes =   1200 sectors
   4M bytes =   8192 sectors
   8M bytes =  16384 sectors
  16M bytes =  32768 sectors
```

If you want to delete a partition, return to the "control partitions" menu and press F6. Remember that files in a partition will be deleted along with that partition. You will be asked to indicate the partition by number, not drive name. Drive A is partition number 1.

After deletion, you are returned to the "control partitions" menu. Press F2 to see the changed situation. Notice that the drive names have changed to reflect the new letters that will be assigned when the operating system is "rebooted" at the end of the HARDDISK utility.

For example, if you deleted the partition associated with drive C of A, B, C, and D, you will now have the remaining partitions associated with drives A, B, and C, where C is the old drive D. On leaving HARDDISK, the system reboots automatically.

You can create a new partition or replace an old one by pressing F4 on the partition menu. You can accept the displayed maximum size or select a smaller size. If you previously had A, B, and D, the new partition will become D changing the previous D to C. After creation of a new partition, the system reboots automatically and the new partition becomes accessible when you leave HARDDISK.

The suggested method for reorganizing the partitions on a winchester that already has one or more partitions created previously by the HARDDISK utility is to back up *all* the files they contain, delete all the existing partitions, and then create the new partitions. The backed-up files can then be copied back.

You can see that partitioning requires careful planning before HARDDISK is used. As well as the above considerations, you can run into problems with the winchester booting option.

There are two important points:

- partitions must contain the CCPM.SYS file to be bootable

- if you do not create any bootable partitions, the only way that you will be able to start up the CHAIN 64 server is from a 3.5-inch floppy disk

However, the secure for transit selection (F4 in the activity menu) is simple to use. When you are going to move your winchester, choose this option and the read/write heads are secured.

Note that any subsequent disk activity will "un-park" the heads, so you should switch off the winchester before leaving HARDDISK.

Installing 480Z Silicon Disk Software

Having installed your software on the Nimbus server, you must decide whether or not you want the network stations to be logged onto the network using the version of the network operating system that includes support for using a silicon disk. Details on silicon disk operation are provided in the Users Guide.

If you do want the silicon disk version of the operating system to be loaded whenever the network station users logs on by typing "N", you should exchange BOOT.SLV (the non-silicon disk boot file) with SIDBOOT.SLV (the silicon disk boot file). This is done as follows at the server keyboard, making sure that no network stations are in use:

1. Set the file BOOT.SLV to read/write and directory status:

    ```
    SET BOOT.SLV [RW,DIR]<ENTER>
    ```

2. Rename the BOOT.SLV file (for example, as OLDBOOT.SLV) so that you can restore it later on, if needed:

    ```
    REN OLDBOOT.SLV=BOOT.SLV<ENTER>
    ```

3. Set the file SIDBOOT.SLV to read/write and directory status:

    ```
    SET SIDBOOT.SLV [RW,DIR]<ENTER>
    ```

4. Rename the file SIDBOOT.SLV to BOOT.SLV:

```
REN BOOT.SLV=SIDBOOT.SLV<ENTER>
```

5. Set OLDBOOT.SLV and BOOT.SLV to system and read-only status:

```
SET BOOT.SLV [SYS,RO]<ENTER>
SET OLDBOOT.SLV [SYS,RO]<ENTER>
```

Testing the 480Z Silicon Disk (RAMTEST)

The RAMTEST utility should be run on each station you upgrade with a silicon disk. This will check that the silicon disk is in working order and should indicate any faulty integrated circuits or incorrect links.

The fitting instructions supplied with the Silicon Disk Upgrade Kit show how the links are arranged. *If you have set the links incorrectly there is a danger that the silicon disk will be damaged when you switch on your station.*

When running RAMTEST:

● ensure that you have RAMTEST on your system disk and start up the station as normal. Enter RAMTEST <RETURN>

● the program will corrupt any existing data on the silicon disk. You should transfer any files you want to keep onto another disk drive before running RAMTEST. You are reminded of this at the start and given the opportunity to cancel the test.

The testing starts with a screen display indicating the system is running a "Short Test", only a few seconds in duration. While it is running, the station will "beep" a couple of times to let you know it is working.

Above the "Short Test" message is a display of the size of RAM in your station (normally 256K) and on the right-hand side of the screen you should see a RAM "map" consisting of four columns of numbers (0 to 7 in each case).

Each column represents a row of integrated circuits in the 480Z: the lower two columns are the rows on the main board and the upper two columns are the rows on the option board.

The integrated circuits in each row are numbered 0 to 7, beginning at the top of a row and working downwards (as you would see the integrated circuits if you removed the 480Z lid).

Next to each number, in brackets, is the capacity of the integrated circuit in that position; for example, all 64K integrated circuits are displayed as "64K". If an integrated circuit is missing from any position it is displayed as "." in brackets.

Similarly, if the capacity of the integrated circuit is not known, the position is marked "?". This indicates a fault in that row of memory.

Note that RAMTEST itself needs 64K of memory in which to work. This is the lefthand bank on the main board – bank 0.

Consequently this part of the memory is not tested. If there is less than 64K of memory in this bank you will get the message:

`Not enough memory`

Short Test

The short test takes only a few seconds to run. It works by writing a pattern of bits to each integrated circuit in turn and reading the pattern back.

If it reads what it wrote, then it knows that the integrated circuit is correct. Otherwise the integrated circuit is displayed on the screen as being faulty and the number of the integrated circuit starts flashing; a "Faulty RAM" message is also shown.

A rarer occurrence is a "RAM present" fault where the system has found a block of memory where it didn't expect to find one!

If all is well the message "RAM OK" is displayed and the long test begins automatically.

Long Test

The next screen displays "Long Test", and the program begins a more exhaustive test of the new RAM. This test takes about half an hour to complete for 192K silicon disk.

Again, bit patterns are written and read back and any faults are indicated in the same way as above. You can exit from the test at any time by pressing <Q>.

When the test is completed and all is well the message "RAM OK" is displayed again and the system returns to the A> prompt.

Again, you can exit from the test at any time by pressing <Q> to return to the A> prompt.

Contents

Chapter 4: Network Device Reconfiguration (SETNET utility)

Chapter 5: Network Start-up and Shutdown

Chapter 1
Security

This chapter shows how you can monitor when files are created accessed and updated by setting date and time stamping of files. Also, you will learn how to provide network security with password protection.

This chapter, and the following one, give information about Concurrent DOS commands. Full details of these can be found in the Reference Module.

Setting System Date And Time

If you want network users to check the system date and time and to use date and time stamping of files, the correct time must be set on the Nimbus. If you have a Piconet Serial Module (see "Upgrades and Options" in the Reference module), the date and time are maintained by a battery-powered calendar-clock contained in it and so are not lost when you switch off. Otherwise, you will have to set the correct values whenever you switch on (or reset) the Nimbus.

Whenever the server operating system is loaded, you will be asked to enter the date in the European format (day, month, year). You do not have to enter leading zeros, and you can use any separator between the numbers (full stop, colon, comma, dash and so on – but not a space). For example:

21.1.86<ENTER>

sets the date to 21st January 1986.

Now, you will be asked to enter the time in hours and minutes. The clock uses the 24 hour format, so the hour figure can be in the range 0 to 23. You cannot enter a seconds value. Again, leading zeros are not necessary, and you can use any separator. For example:

`11-6 <ENTER>`

specifies 11.06 am, and:

`14-23 <ENTER>`

specifies 2.23 pm.

When you have selected the date and time values, press any key to set them.

Date And Time Stamping Of Files

By setting date and time stamping on a drive, you can monitor when network users create, access, and update files on that drive. This process takes up 25% of the directory space on the drive and so reduces the maximum number of files that can be stored on the drive. Bear this in mind before using date and time stamping.

To set up a drive directory for time and date stamping and password protection (see later), you must initialize it with the INITDIR command followed by the drive name. For example, to initialize drive B, type:

`INITDIR B:<ENTER>`

Type Y in response to the question, and the directory is reformatted automatically for date and time stamping of files. This does not damage any files that are on the drive – it is only the directory that is reformatted.

Labelling a Directory

After you have used INITDIR, you must give the
drive directory a label name with the SET command.
For example:

```
SET B: [NAME=STUDENTS.DAT]<ENTER>
```

This produces the following display:

```
Label for drive B:
```

Directory Label	Passwds Reqd.	Stamp Create	Stamp Access	Stamp Update
----	- ----	----	----	----
B:STUDENTS.DAT OFF		OFF	OFF	OFF

This shows that the drive directory has been labelled with
the label name. Also, it shows that password protection
of files is currently switched off, as are any date and
time stamping activities.

Forgetting password protection for now (it is covered in
the next section), you can turn on the date and time
stamping options with the SET command. For example, type:

```
SET B:[CREATE=ON]<ENTER>
```

and you will see the above display again with "Stamp
Create" switched on.

In this state, the date and time of creation of all files
on drive B will be recorded. You can see the recorded
information by producing a display of files with the
SDIR command:

```
SDIR B:
```

To begin with, any files already present will not be stamped with any date and time. As new files are added, they will be recorded with the date and time that this takes place.

The access option, when switched on, records when a file was last accessed for reading or printing purposes, but not modified. The access and create options cannot be on together. Only one of them can be monitored at any time.

The update option records when a file was last modified.

Password Protection

The management of passwords is an important aspect of the network manager's job.

Password protection provides two levels of security for your network system:

- password protection of drive directory labels on the server. As the network manager, you can prevent anyone who does not know the label password from switching password protection of any file on or off

- password protection of files on the server's disks accessed by any of the stations on the network. It is the manager's job to assign passwords to files that users wish to protect from access by other users. Password protection cannot be carried out from a network station, it is only possible using the network server

You can assign a password to each of the drive directory labels so that date and time stamping options, and password protection of the files they contain, cannot be enabled or disabled unless the directory password is known.

Remember that, like date and time stamping, password
protecton uses directory space.

To assign a password to a directory label, you must turn
password protection on first:

`SET B:[PROTECT=ON]<ENTER>`

Now, you can assign a password (up to eight characters) to
the label. For example:

`SET B:[PASSWORD=HANDSOFF]<ENTER>`

The table of label information will be displayed once
more, but this time your label password is displayed.
This is the only time that it will be displayed.

You *must* remember (or make a note of) the password. From
now on, when you want to enable or disable passwords on
the drive, or to change the date and time stamping
options, you will be asked for the label password. If you
forget the password, you will not be able to change the
options.

Protecting Files

You can protect individual files with passwords. Do this
by assigning a password to a file with the SET
command. First, if not already enabled, you must switch
password protection on for the drive containing the file.
For example:

`SET A: [PROTECT=ON]<ENTER>`

If the directory label of drive A is password protected,
you will be asked for the password before you can proceed.

Now, you can assign a password to a file:

`SET A:TIME.COM [PASSWORD=KEEPOUT]<ENTER>`

This prevents network users from using the TIME utility unless they know the KEEPOUT password.

If you want to remove password protection of all files on a drive, use:

```
SET A: [PROTECT=OFF]<ENTER>
```

See chapter 4 of the Reference module for full details of the SET utility.

Chapter 2
File Management

The most common file-handling operations you will need to perform can be summarized as follows:

- copying software onto the winchester (PIP command)

- formatting new disks (FORMAT command)

- creating back-up copies of winchester disk and floppy disk files (PIP command)

- using the Nimbus silicon disk

- user numbers

- setting file attributes (SET command)

- deleting files (ERA command)

- renaming files (REN command)

Disc and disc file maintenance is a regular and essential part of efficient network operation. It should become a scheduled activity at the end of each day, or each week, and should not be left to the discretion of individual station users.

You should prevent unauthorized access to these facilities by creating passwords for these files.

Copying Software on to the Winchester

If you have a 5.25-inch disk drive attached to your Nimbus server, you can use the PIP command (PIP.CMD) on the Nimbus to copy files. For example, to copy all the files on the top surface of the 5.25-inch Network Bundle disk (drive G) to a drive on the winchester (drive B, for example), type:

```
PIP B:=G:*.*<ENTER>
```

If you intend to copy files using a floppy disk drive belonging to an old CHAIN Network server that is now available as a second server in an upgraded CHAIN 64 network, do the following:

- make sure that the second server is switched on and has been started up with the CHAIN (8-bit) operating system

- use a 480Z station to log onto this second server with the NETWORK command:

```
NETWORK I:=B:[7F]<RETURN>
```

This command associates drive I (when used at your 480Z station only) with drive B on the second server. This will be the top side of the right hand floppy disk drive, unless your second server still has a winchester disk!

This example assumes that the network address of the second server is 7F (hex). This is the setting when it left the factory, but it could have been changed subsequently.

Now, still at the 480Z station, you can use PIP (PIP.COM) command to copy files from a disk in drive B of the CHAIN network server to the Nimbus winchester:

```
PIP B:=I:*.*<RETURN>
```

The FORMAT Utility

On the Nimbus, the FORMAT utility supplied by
Research Machines prepares new 3.5-inch or 5.25-inch
double-density floppy disks for file storage. Also, it
can be used to delete unwanted files from old disks.

Remember that disks must be write-enabled for formatting:

- a 3.5-inch disk should have the write-protect hole
  closed

- a 5.25-inch disk should have the write-protect notch
  uncovered

You can format a disk while the network is in use, but
station users will not be able to access the Nimbus disks
during the operation. So, it is advisable to do your
formatting when the network is not in use.

To use FORMAT, log onto a Nimbus drive containing
the FORMAT.CMD file and type:

`FORMAT<ENTER>`

A screen menu appears (similar to that of CONFIG
and HARDDISK), and the function keys are used to
select options. Keys F2, F4, F6, F8, and F10 select
the drive that is to be used.

FORMAT displays only those drives that are present.
For example, if you have two 3.5-inch drives, only keys F2
(left drive) and F4 (right drive) will display options.

When you select a drive, the formatting screen appears.
Place the disk in the selected drive, press y, and
formatting will commence. You can stop the operation by
pressing the F9 key. Otherwise, when formatting and
verifying are finished, you are returned to the main menu.

Now, you can format another disk or you can leave the utility by pressing the F9 key.

FORMAT places 80 tracks on each side of a 3.5-inch disk. The 3.5-inch disk is formatted to allow the CDOS operating system to be booted from it, if you choose to copy the operating system file onto it.

A 5.25-inch disk is formatted in double density with 40 tracks on each side, so that it can be used with 380Z and 480Z double-density disk drives, but it cannot be used to boot *any* operating system from it.

This applies to CDOS on the Nimbus server and to CP/M or MP/M on 380Z, 480Z or 8-bit CHAIN network systems. Such disks will need to be formatted again if they are to be used as systems disks on any of these 8-bit computers.

Backing-Up a Winchester

Backing-up means copying all files from a winchester to floppy disks at regular intervals.

Why Should You Back-up a Winchester?

As with floppy disks, there is always a danger that the recording medium of the winchester may be damaged. There may be accidental erasure of files by users, and it is possible for a system problem to damage files.

When Do You Back-up a Winchester?

It is good practice to back-up your winchester at least once a week.

How Do You Back-up a Winchester?

There are two methods, one is to use PIP as discussed below. The other is to use the BackRest programs, which are discussed in Chapter 5 of the Reference Module.

If you choose to use PIP you can ensure that only those files that have been modified since the previous back-up are copied by using the archive option with PIP, for example:

```
PIP E:=C:*.DAT[A]<ENTER>
```

This sets the archive bit on all .DAT files found on drive C. When any of the .DAT files on drive C are modified, Concurrent DOS turns the bit off. So, next time you back-up, only the modified files are copied.

Remember to label the back-up floppy disks so that you insert the correct disk when you next back-up.

Using the Nimbus Silicon Disk

If a number of network users want to access several applications on the winchester at the same time, you can obtain some performance improvement by copying the most frequently accessed program and data files from the Nimbus winchester to the Nimbus silicon disk. Then, users access them on the silicon disk (drive M) instead of on the winchester drive.

First you must use CONFIG (see the Reference module) to set up the silicon disk memory size.

Don't forget to restore any new or updated files back onto the winchester at the end of a session that uses the server's silicon disk. The contents of the silicon disk are lost when the Nimbus is switched off.

The use of the Nimbus silicon disk is at the discretion of the network manager who will need to arrange the procedures to be followed by the network station users.

Security of the files on the silicon disk is obtained through passwords. The volume label is created automatically by the operating system so you do not need to use the INITDIR command. However, you do need to enable the use of passwords and time (and date stamping facilities) with SET before you can use the SET command to assign a password to a file.

You can create a batch (.BAT) file containing a sequence of commands that copy files into the silicon disk and set their passwords. The batch file can be executed by using the BATCH command when you start up the network.

Another batch file would be useful to analyse the contents of the silicon disk and copy any files back onto the winchester or floppy disks before you switch the Nimbus server off and lose them.

First you must use CONFIG (see the Reference module) to set up the silicon disk memory size.

User Numbers

The CHAIN 64 operating system has a file-handling facility called "user numbers". Each user can select a user number in the range 0 to 15. Each file stored on a disk is stored with a user number.

Apart from two exceptions (see below), a user cannot access a file that has not been stored with the user number that the user has selected. When you switch on the server, and the A> prompt appears, you are using user 0. If you type:

```
USER 2<ENTER>
```
the prompt will change to 2A>, indicating that you have
selected user number 2. This is the same on the 480Z
stations except that the prompt does not display the
current user number at a 480Z. Now you can access any
file on any drive provided that the user number was also
2 when it was created.

More than one user, in fact all users, can use the same
user number. Alternatively, several people, each with a
different user number, can use an application program and
create files (with the same name!) on the same drive at
the same time.

For example, two people in different user numbers can use
WordStar to create files on drive B:, and they do not
interfere with the files of each other.

With a winchester disk, you can keep files separate on
multiple logical drives and you can subdivide (logically
but not physically) each logical drive into different user
numbers.

The two exceptions about file access mentioned above are:

1. Files created in user 0 can be accessed from any other
   user number, provided that the files have SYS
   and read-only attributes (see the following section on
   file attributes). It is normal practice to keep
   often-used system and application files on user 0 of
   drive A of the winchester with their attributes set to
   SYS and read-only.

   For example, 15 people, each using a different user
   number, can edit different copies of a file called
   LETTER.TXT with the same copy of WordStar.

2. You can copy a file from one user number to another
   (see PIP). The filename and filetype remain the
   same.

File Attributes

You can assign attributes to files. These attributes
specify how a file can be accessed.

A file may have one or more of the following attributes:

- read-only (RO) – information can be read from the
  file but not written to it. This attribute must be
  used if a file is to be accessed simultaneously by
  several users

- read/write (RW) – the file can be read from and
  written to. A file with this attribute cannot be
  simultaneously accessed by several users

- system (SYS) – the file, in user 0, can be
  accessed from all user numbers. It is not displayed
  when the DIR command is used (at the server or
  at a station). It can be displayed at the server with
  the SDIR command, and at the station with the
  STAT *.* command

- directory (DIR) – the file can be listed on the
  screen using the DIR command at the server or
  at a station. This gives a listing of all files with
  the DIR attribute that are stored in the current
  user number

- a CP/M compatibility attribute – this is needed
  for programs that were written for a standalone CP/M
  system and are required to run on the network. See the
  SET command in chapter 4 of the Reference module

When a file is created, the system automatically assigns
the DIR and RW attributes to it. You can use the
SET command to change the file attributes of created or
copied files. For system and application program
(COM) files to be used simultaneously, and with users in

any user number on the network, the files should be set to
SYS and read-only, and in user 0. This does not apply
to other types of file.

For example, perhaps you have purchased a new educational
word processor called "Writeit". After copying it from
the supplied disk to drive A on the winchester, you would
use SET to give it the SYS and read-only attributes:

```
SET WRITEIT.COM[SYS RO]<ENTER>
```

When setting attributes, remember that a file cannot have
read-only and read-write attributes at the same time, nor
can a file be set to both SYS and DIR. Attributes
can be set at any time, and the use of the network can
continue while the SET command is used from the server.

Chapter 3
Network Performance

This chapter gives details of the ANALYSER and
MONITOR utilities that are used at a 480Z
station to log the behaviour of the network.

Logging network behaviour is an important task. It
involves recording any problem that you or other station
users encounter while using the network. It helps you to
pinpoint the cause of the problem areas, and this should
help you to improve the efficiency of the network.

The ANALYSER Utility

ANALYSER is a program that gives a detailed
overview of "real-time" network activity in the form of a
screen display. It works like this:

1. It determines whether a packet of information is from
   a station or a server, and also the network address of
   the receiver and the sender.

2. It calculates the current rate at which a station or
   server is sending packets of information, in packets
   per second. A check is kept of the time interval
   between packets. If a packet is expected within that
   interval, but none arrives, this provides useful
   diagnostic data.

3. A command interpreter reads the keyboard and acts on
   sequences of keystrokes. This is a background task
   which is running all the time and is interruptable by
   other processes.

ANALYSER is started at a 480Z station by entering:

```
ANALYSER<RETURN>
```

Screen Display

A sending station or server (the sender) is displayed on the screen only if it has sent data since ANALYSER was started. The display is in three parts:

- title and column headings

- the moving bar scale

- command line and option line

There are five column headers:

- "TX" containing the 2-digit hexadecimal identity of the sender

- "RX" containing the 2-digit hexadecimal identity of the receiver – only present while packets are being sent

- "FN" containing the 2-digit hexadecimal number of the port for the last packet

- "Status" defines the status of the sender (see below)

- "Flags" containing a combination of any of six lettered flags (see below)

The status of a sender can be:

Requester :
> the station has been booted from a network server or has network support loaded from a local disk.

A simple explanation of the levels in the system should suffice to explain what's going on.

User's Applications	
CP/NET or CP/NOS	SNIOS
	NDOS
CP/M (if CP/NET)	BIOS
	BDOS
Message Layer	ZEP
Packet Layer	ZEND
Hardware	Transceiver

The statistics refer to what has been happening since the computer was switched on.

To gain an impression of how the Network is performing in "real time" you should use the ANALYSER utility (described above).

To run MONITOR, enter:

```
MONITOR<RETURN>
```

The Options Available

There are four statistics options to select: ZEND, ZEP, SNIOS, and Network. You will find the Network statistics most useful.

ZEND Statistics

These refer to transactions at the lowest level of the Network System.

- transmissions are first set up and then the packets are sent, so there are two counts for transmissions (Transmit Setups and Packets Sent)

  If the network cable is in use there will be collisions, but these should be fairly infrequent. If there are a lot of collisions there is cause for concern.

  In the event of a collision, the packet will be retransmitted according to a "backoff" algorithm. Failure to transmit after a set number of retries will result in a Retry Giveup error.

- receives, like transmissions, are first set up and then if a packet is actually received in the timeout period, it is counted

- CRC errors are caused by corruption of the packet. A Cyclic Redundancy Check (CRC) is added to the end of each packet. If the new check-code generated from the data does not match the CRC transmitted after the data then an error is flagged

- a Receive Overrun indicates that a longer packet was received than was expected from the header. This indicates a corruption of the data on the cable

- a Receive Fail is just that – a packet came by addressed to the station, but receive failed in the firmware because the packet arrived before the firmware was in a fit state to receive the characters from the Network Interface

- an Aborted Packet is, again, just what it says: the transaction was aborted either by disconnection of the cable or by a premature end-of-message flag (EOM)

- a Short Packet is a packet shorter than the length declared in the header

- a Transmit Underrun occurs when the output loop in ZEND couldn't keep up with the SIO chip, perhaps because of some stray interrupt

- a Transmit Giveup (timeout error) is generated when a packet cannot be transmitted (because of cable activity) within the time of three maximum length packets

- transmit Reset is never set up in the firmware

- any packets which are not addressed to the user's station are counted but ignored ("Not My Packets")

- as a catch-all category there is a count of 'Weird' errors. These are errors which should never happen (but do anyway)

ZEP Statistics

- transmitted Messages: the number of transmissions (Datagrams only)

- received Messages: the number of received packets

- echo Requests Transmitted: the number of times an echo request was transmitted

- echo Replies Received: the number of replies received to echo requests

- echo Replies Transmitted: the number of times an echo request has been replied to

- discarded Packets: packets received but thrown away because the firmware was not interested in receiving them

- posted Packets: these may well have been deleted in the later versions of the ZNET ROM. It's a way of buffering packets and passing them (posting) to other levels of the firmware

- accepted Packets: packets accepted by other levels of the firmware

- unknown Version Receives: not originated by the correct version of ZEND

- unknown Type Receives: the type of the packet is not an RML format packet

- unknown Port Receives: the port expected to receive the packet was not opened by a higher level of firmware

SNIOS Statistics

- transactions Sent: the number of transmitted packets

- failed Transactions Sent: the number of transmissions which weren't replied to

- messages Sent: the number of complete messages transmited and acknowledged

- messages Received: the number of replies received

- retries: the number of attempts at retrying due to timeout in reception

Network Statistics

- retries vs Transactions: this should be fairly low

- collisions versus Packets Sent: this should be nearly zero (ideally, zero), and appears only if it is not zero

There will always be a copy of one of the other four tables. It remains in the station until the reset button is pressed or another command is used, or the station is turned off.

The table is temporary and unique to each station. Any changes you make to this table will only be effective on the station at which the changes are made until the next time the station is reset or you use the SID, or NOSID, or CPM command. You can be in any user number when you use this option.

To display and modify this table, make sure the box is selected and press <RETURN>.

The table lists all the available disk drives, and the printer, and tells you if each is either "remote" (a network drive or printer) or "local" (attached to the station).

To change a drive setting from remote to local or from local to remote, move the cursor, using the arrow (up and down) keys, to the line you want to change. Press the <SPACE> bar to change "local" to "remote" (or vice versa). If the cursor is on the line for drive A which says:

```
drive A: is remote A: on server [7F]
```

Press <SPACE> and this should now say:

```
drive A: is local
```

Press <SPACE> again. This should change A: back to a remote drive. Try it.

The number in the square bracket is the server address in hexadecimal.

To change a remote device assignment to another logical drive name, press the right-arrow key. The cursor will move to the device letter and the message "Type A to P — remote drive letter" will appear above the list. Type in the new device name letter.

To change the server address for a given device assignment (either a disk drive or printer), press the right-arrow key once or twice until the cursor is positioned over the hexadecimal address field. Type in the new hexadecimal address.

You may press <CTRL/Q> to get further help instructions.

When you are quite satisfied that the settings are correct, press <CTRL/D>. After the message:

`Update table — are you sure? (y/n):`

press Y and the table is updated. Remember that these settings will only apply for this table until the station is switched off or reset. The original table will be loaded into the station when the station is "re-booted".

Server's Configuration Table (BOOT.SLV)

This feature should only be used by the network manager. BOOT.SLV is the server's internal configuration table and any changes made to it affect *all* stations and are *permanent* until you next change the BOOT.SLV table.

It is used with the commands N, NS, RUN, BOOT and CPNOS.

The procedure is exactly the same as that given above for the current configuration table except that you must be in user 0. Note that the [00] in the table is automatically replaced each time the software is loaded into a station.

If you change the BOOT.SLV file with SETNET, you must use CTRL/D to exit, otherwise the file will not be closed and the network will hang up. Also, the network should not be in use while you are changing BOOT.SLV.

If a user accidentally alters drive A to be "local" and updates the BOOT.SLV table, nobody will be able to use the network! If this happens, the manager should use the Nimbus server to erase the BOOT.SLV file and replace it with a copy of BOOT.SLV from the original distribution floppy disk.

To avoid such problems, we recommend that you password protect BOOT.SLV with write protection so that users can look at it but cannot change it.

Local Disk Configuration Table (SNIOS.SPR)

480Z stations with local disks have the device configuration table SNIOS.SPR on the local system disk. To modify this table permanently, select the SNIOS.SPR option. This is used with the NET command, described in chapter 6 of the Users Guide.

Silicon Disk 480Z Configuration Table (SID.COM)

This applies to all network stations working with silicon disk support software loaded using the SID command (see chapter 5 of the Users Guide). It can be modified permanently by selecting the SID.COM option. You must be in user 0 to use this option.

Non-Silicon Disk 480Z Configuration Table (NOSID.COM)

This applies to all 480Z stations loaded using the NOSID command (see chapter 5 of the Users Guide). It can be modified permanently by selecting the NOSID.COM option. You must be in user 0 to use this option.

Contents

Chapter 1
Printers

Introduction

This chapter summarizes the types of printers available and the factors involved in making them work.

A computer printer is a piece of equipment that can print out on paper copies of data from the computer. Two types of impact printers are widely used with computers at present:

- dot-matrix printers are generally high-speed and low-quality, but expensive models of this type are capable of high-quality output, and they can provide a large range of features. Some are capable of printing in several colours.

- daisy-wheel printers are capable of very high quality results, but they operate at lower speed, and they are less likely to provide all the features. Some effects can be achieved only by pausing to change the print-wheel.

An expensive printer can cost more than ten times as much as a cheap printer. You have to consider quality, speed, robustness, suitability for use, and price when choosing from the many printers on the market.

Much research into printers continues, and new models are announced frequently by many manufacturers.

How a Printer Works

A computer printer operates in a simple way. Characters to be printed are represented by codes which are sent from the computer along a cable to the printer, one at a time.

This simple picture is complicated by some difficulties. You need the correct cable and connectors, and the computer and printer must be set up to communicate with each other. These matters, and how to get over them, are described in chapter 3 of this module.

One very important point about printers is that they have either a serial or a parallel interface. An interface converts signals that are to be sent into a standard form suitable for transmission, and converts signals that are received into the required internal form. It is essential that the two interfaces in any one communications link have matching characteristics.

Parallel Interface

In a parallel interface, several (usually eight) signals are transmitted simultaneously. This allows transmission of data to take place one byte at a time, which is efficient, and a parallel interface requires fewer electronic components than a serial interface.

A parallel interface is attractive for short connections, but it is not suitable over long distances.

Serial Interface

This type of interface transmits and receives data one bit at a time. A serial interface has to separate the bits in each byte sent, and reassemble each byte received. The time taken to transmit a byte serially is longer than in parallel mode, so serial interfaces generally operate at lower speeds than parallel interfaces.

A serial interface is generally more flexible, although slower, than a parallel interface, and particularly attractive over long distances.

All serial interfaces have to operate at a particular speed, known as the *baud rate*. Nimbus serial interfaces can be set (by means of the CONFIG and PICONFIG utilities) to operate at any of the following standard speeds:

75   110   300   600   1200   2400   4800   9600

(and 19200 baud on the auxiliary serial interface only).

Long distance communication is possible with serial interfaces, and they can be coupled, by means of modems, to telephone lines. Telephone connections via public exchanges are reliable only at speeds of 300 baud or less.

The speed of data transmission between serial interfaces in characters per second is approximately one tenth of the baud rate.

Communicating serial interfaces must operate at the same speed, and several other parameters must also match (see later section).

If you bought a serial printer from Research Machines for use with Nimbus, it is set up to work. Just follow the instructions at the start of the next chapter.

Chapter 2
Connecting and Using Printers

This chapter shows you how to connect one or more printers to your Nimbus server, and how to print with them.

A New Printer

The following instructions show how to connect a serial printer supplied by Research Machines for your Nimbus server. You may have to consult the printer manual if you are unsure about cable connections or printer controls.

1. Plug the printer into the mains supply.

2. Connect the printer to the Nimbus printer socket with the cable that has a 25 pin, D-type plug on one end (the printer end) and a 6 pin, Bell plug (the Nimbus end).
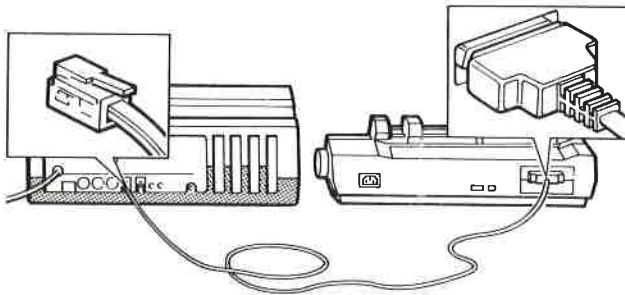
3. Switch on the printer and make sure it is on-line and make sure that there is paper in the printer.

Your printer is ready to print. This is the simplest case of printer connection. If you want to try printing something now, use the PIP command at the Nimbus keyboard:

```
PIP LST:=DEMO.BAS<ENTER>
```

Two Printers

You can have two serial printers connected to the Nimbus by attaching a second printer to the Aux/Piconet socket.

Convert the Aux/Piconet interface to the OP (output) mode with CONFIG so that the interface acts as a second printer socket. Do this before plugging in the printer.

Enter CONFIG and press <F4> to select external devices, then press <F4> to select Aux/Piconet. The interface mode should be set to OP by pressing <F2> until OP is selected. Now press <F9> and <F2> to select it as the permanent option.

Selecting a Printer

When you switch your Nimbus on, any output to be printed will be sent directly to the printer attached to the printer socket. This is the default printer – called printer 0, and output from the PIP command entered from the server, is sent to printer 0.

A printer connected to the Aux socket in OP mode is known as printer 1. You can select this printer from Nimbus with the PRINTER utility:

```
PRINTER 1<ENTER>
```

- remove print jobs from the queue

- stop the printing of a job

You can find out about the facilities by typing at the server:

`SPOOL HELP<ENTER>`

and information about the SPOOL PRINT command and the other SPOOL commands.

The SPOOL START command is used to set up the spooler system and printer(s) files will not be spooled until SPOOL START has been used.

The SPOOL START 0 command is included in a start-up batch file (START001.BAT) so that a spooler queue is always available as soon as the CHAIN 64 server is switched on.

If you have more than one printer, you can edit the START001.BAT file (with WordStar or TXED at a station), adding the number of each printer available for spooled output.

For example, changing the command to SPOOL START 0 1 2 9 automatically sets up printers 0, 1, 2, and 9. Always include the 0. This change will not take effect until you next reset the Nimbus.

You can make a temporary change to the spooler when the network is running by entering at the server:

`SPOOL RESET<ENTER>`

then, by declaring the printers with the SPOOL START command. For example:

```
SPOOL START 0 1 2 9<ENTER>
```

sets up spooling for printout on printers 0, 1, 2, and 9. Again, you must always include 0 in such a command.

SPOOL PRINT is used to send files to the spool queue (on drive A) of the specified printer for printing. For example:

```
SPOOL PRINT B:RESULTS.DAT [PRINTER = 1]<ENTER>
```

You can specify how many copies of a file with the COPIES option:

```
SPOOL PRINT I:JOE.BAS [PRINTER=3 COPIES=5]<ENTER>
```

The other SPOOL PRINT options are useful with ASCII files.

If you want to know what jobs are already in the spooler queue for each printer before you decide which queue to join, use:

```
SPOOL STATUS<ENTER>
```

The SPOOL DELETE command allows you to remove a file from a queue, and the SPOOL TERMINATE command lets you stop printing if something has gone wrong.

All these facilities are available to network users at their stations using the SPOOL.COM utility. Probably, they will only use the SPOOL STATUS and SPOOL PRINT commands, and you will set up the spooler system.

Chapter 3
Making Connections

In this chapter, you learn how to make most printers work
with Nimbus. The first part gives details of how to match
up the printer and Nimbus interfaces for serial printers.

The second part shows you how to use Piconet with printers
that cannot use the Nimbus printer socket – parallel
printers and a few serial printers.

Serial Printers

A serial printer supplied by Research Machines for use
with Nimbus has the correct cable and interface settings.
For other printers, you may need a new cable and you may
have to set the printer interface to match the Nimbus.

A cable can be obtained:

- by purchasing 6-wire Nimbus printer cable with a Bell
  plug on one end and a D-type plug on the other (from
  Research Machines or other suppliers)

- by purchasing 6-wire cable with a Bell plug on one
  end and no plug on the other end (from Research
  Machines or other suppliers). You put a plug to suit
  your printer on the other end

- by making your own printer cable

Making your own Cable

If you want to make up your own cable to connect a printer to Nimbus, you will need to know the pin connections.

Chapter 3 of "Technical Data" in the Nimbus Owners Handbook includes the necessary information for the Nimbus printer socket, and the printer manufacturer's manual should tell you all you need for the printer end of the cable.

Make sure that you connect the data line, the busy line, and the ground line. Connect the busy line to a line on the printer that goes low when the printer is busy. If any part of the text is not printed, the busy line is probably connected incorrectly.

On some printers, it is necessary to disable the printer's handshaking. Often, you can do this at the printer connector by connecting CTS to either RTS or DSR to make the printer give itself the answer it is looking for.

Advice on printer connection is available from your supplier's Technical Support team.

Printer Interface Settings

For interface settings, it is essential that the parameters set in the printer interface match those set in the Nimbus interface. The main interface settings concerned with communication between printer and computer are baud rate, word length, parity, and stop bits:

- the baud rate is the rate at which data is transferred between devices. A serial interface has to operate at a particular baud rate. It is essential that a serial printer interface and a computer interface are set to operate at the same baud rate

Facit 4565 Printer

switch	setting	function
SW40 1	open	Baud rate
SW40 2	open	set at 2400.
SW40 3	open	Eight data bits.
SW40 4	closed	Disable parity.
SW40 5	closed	Parity type (not used).
SW40 6	closed	One stop bit.
SW40 7	open	Protocol select (not used).
SW40 8	closed	Not used.
SW41 1	open	Line mode.
SW41 2	open	Carriage return.
SW41 3	closed	Auto space.
SW41 4	closed	Not used.

Nimbus Interface Settings

These switch settings match the standard Nimbus printer interface settings. You can see (and change) the Nimbus settings by using the CONFIG utility:

- on the Nimbus, log onto drive A

- type CONFIG<ENTER>

- press the F2 key to select the printer interface

You should see that the baud rate is set to 2400, the parity bit is set to none, the word length is set to eight, and the stop bit is set to one. You can change any of these settings by pressing the appropriate function key.

When you leave this menu by pressing <F9>, you have the choice of making a permanent or a temporary change, or forgetting any change that you have just made.

Any changes that you make will not be implemented until you reset the computer by switching off or by pressing <CTRL/ALT/DEL>.

With the CONFIG utility, you can arrange for Nimbus to communicate with most serial printer interfaces, with either fixed or variable parameters. The only Nimbus setting that you are likely to want to change is the baud rate.

Problem Solving

If your serial printer interface can operate at only one baud rate, you must ensure that the Nimbus interface used for that printer is set to the same rate.

If your serial printer interface can operate at various baud rates, we advise you to use the highest rate available, but for that you will probably need to have *flow control* in operation.

As well as the electrical signals that represent the characters to be printed, there may be other signals carried on separate wires (*hand shake lines*) in the cable between the computer and the printer.

For example, the signals can be used to tell the printer that the computer has a character ready to be transmitted. The printer can use them to tell the computer whether it is ready to receive a character.

In other words, these signals can be used to control the flow of data, and if they are so used then *flow control* is in operation.

Flow control is not necessary when characters go to the printer so slowly that it can be guaranteed to have finished printing any character before the next is due to arrive.

Chapter 4
Printer Facilities

This chapter covers on-line or local printing, and how you can send instructions to the printer to obtain special characteristics such as underscoring and bold printing.

Also, there is a listing of the common features found on printers, and a summary of the main features of the printers currently supplied by Research Machines for use with Nimbus.

On-line or Local

Most printers have a switch labelled "On-line/Local" or similar. This allows the printer to be controlled either by the computer (on-line) or manually (local).

Switching a printer to local mode transfers control of paper positioning, and possibly other printer features, to a control panel on the printer, and sets the flow control line to "busy". This is particularly useful when the paper has run out or a new ribbon is required. Provided that flow control is in operation, no data from the computer will be lost while the printer is off-line.

Sending Codes

Some features of a printer are obtained by sending codes from the computer. For example, you can make a printer print bold characters.

Unfortunately, there is not universal agreement on the codes that control some features. A program that gives the required results on one printer may not do so on another, even though the second printer has the necessary capability.

Different codes may have to be sent from the program. Consult your printer manual for details. However, the decimal values of 13 and 10 are standard among all printer manufacturers, and they represent *Carriage Return* (moves the print head back to the beginning of the current line) and *Line Feed* (advances the paper by one line).

Other decimal codes in the range 0-31 are used sometimes for special purposes, such as switching a printer into compressed mode or turning underscoring on or off.

For example, the instruction in a Basic program:

```
PRINT #2, 15
```

will set the condensed print feature on an Epson printer.

Sometimes a single code cannot contain all the necessary information. In such cases, some printers respond to a sequence of codes. Another Basic example is setting the subscript print feature with an Epson printer:

```
PUT #2, 27, "S", 0
```

Once a certain code has been received by the printer, subsequent codes are not printed, even though they may normally represent printable characters, but are treated as part of the control sequence.

The control sequence may consist of a fixed number of codes, or it may be terminated by a certain code.

Printer Features

This section gives some of the features found on various printers, and it describes the particular printers for use with Nimbus available from Research Machines at the time of writing.

The following features are the most common ones:

- Underscore. The instruction to obtain this feature (like most others in this list) begins with one code and ends with another. Some printers underscore a space and others do not. If they do not, and you want the line to continue across spaces, you can separate words by an underscore character

- Bold printing is sometimes available. Usually, it is achieved by printing the required text two or three times (sometimes with a very small horizontal offset between each pass)

- Expanded print doubles the printed width of the characters, but it does not affect their height. This feature can be useful for titles or headlines

- Compressed print squeezes the characters into a narrower width than usual, enabling you to print perhaps 15 characters per inch

- Alternative typefaces are sometimes available. Those that look best are proportionally spaced. This means that each character occupies only as much horizontal space as it needs.

  It also means that some word-processing programs break lines in strange places and fail in any attempt to produce right-justified text, because they calculate simply in numbers of characters. Text in the form of tables is also more difficult to lay out neatly when using proportionally spaced characters

- National variations of the standard character set are sometimes available, and they provide different currency symbols, letters with accents, and other alternative symbols

- Entirely different character sets can allow you to print using different symbols. For example, you could print in Arabic

- A character set consisting only of odd-looking shapes can allow you to construct your own large characters relatively easily. These may require three or four passes of the print head for each line of text

- Sometimes, you will have the option on a single printer of high-speed, draft-quality printing, or slower, high-quality printing for the final version of documents

- Sometimes, margins and line lengths can be set up on the printer, with text automatically centred or aligned to the right margin

- You may be able to control line spacing, page length, and top-of-page positioning (for use with continuous stationery)

- Often, horizontal and vertical tabs are available

- Often, superscripts and subscripts are available

- Graphics may be supported in low-resolution or high-resolution forms

At low resolution, any normal character can be positioned on the paper by small horizontal and vertical increments.

On some high resolution, dot-matrix printers, the separate needles of the print head can be controlled individually, enabling very small dots to be plotted with a resolution of over one hundred dots per inch vertically and several hundred dots per inch horizontally

- Some printers can transmit diagnostic codes to the computer if certain fault conditions are detected

Nimbus Printers

The following table summarizes the main features of the printers currently supplied by Research Machines for use with Nimbus. It is intended to help you to compare the printers and to see which may be the most appropriate for your own circumstances. Full technical details of each will be found in the manufacturer's manual supplied with each printer.

	Epson LX80	Epson RX100	Facit 4565	Juki 6100
Type	Dot-matrix	Dot-matrix	Daisy-wh	Daisy-wh
Print quality	Good	Moderate	Excellent	Excellent
Price	Low	Medium	High	Low
Max char/sec	100	100	40	17
Max baud rate	9600	9600	2400	2400
Flow control	Yes	Yes	Yes	Yes
Prop spacing	No	No	Available	Available
Max paper width	10"	16"	16"	13"
Max char/line	160	233	163	165
Min vert step	1/216"	1/216"	1/48"	1/48"
Min horiz step	1/16" approx	1/16" approx	1/120"	1/120"
High-res graphs	Yes	Yes	No	No
Horiz tabs	Yes	Yes	Yes	Yes
Vert tabs	Yes	Yes	Yes	Yes
Super/Subscript	Yes	Yes	Yes	Yes
Form feed	Yes	Yes	Yes	Yes
Var line space	Yes	Yes	Yes	Yes
Var char pitch	Yes	Yes	Yes	Yes

Contents

Chapter 5: The BackRest Utility

Appendix: Error Messages

Chapter 1
The CONFIG Utility

The CONFIG utility is a large and versatile
configuration program that uses friendly screen menu
displays and the function keys on the left of the main
keyboard.

CONFIG allows you to set up a number of features,
such as colour of text and background, external
interfaces, and silicon disk memory size for permanent
or temporary use.

Instead of having to learn the syntax of typed-in
commands, you can choose from displayed options by
pressing the appropriate key.

Don't be daunted by the prospect of seeing what it can do.
Details of what you can control are given on the screen,
and menus of what is available are given at stages. Each
menu offers a "Help" screen and a way out, and other
options.

The first section of this chapter shows you how to use
CONFIG. Then there is some information about the
options it gives you. Finally there is a section about
colour.

Using CONFIG

If you are at operating system command level (the >
prompt), you can run CONFIG from a disk
containing it, by typing:

```
CONFIG<ENTER>
```

After a short time, the colourful main menu will appear. Have a look at the screen display. There are ten squares, numbered F1 to F10, representing the keyboard F keys.

Most of the squares have text by them. This tells you the option associated with each key.

Notice the rectangle round the F1 text. This indicates the current option, and it will be selected if you press <ENTER>. Do this, and a "Help" screen will appear with information about the options from this menu.

Return to the main menu by pressing <ESC>. Before you choose any of the options, try moving the rectangle from option to option either by pressing <space> or by using the arrow keys on the numeric keypad.

You can press an F key to select an option, even when the rectangle is somewhere else. For example, press the F2 key and the drive allocation menu will appear.

In other cases, pressing an F key does not select a menu. Instead, the rectangle is moved to the text of that key and an option in the text is changed. For example, press the F4 key. You change the number of external floppy disk drives from 0 to 1.

Once you have changed to the required option, you can leave this "choice" menu by pressing the F9 key. The quit menu gives the option of saving your changes.

CONFIG can store changes permanently (the F2 option) by rewriting the contents of the configuration memory and these new contents are used by the operating system only when Nimbus is started up or is reset by you pressing <CTRL/ALT/DEL>. However, some permanent options do have an immediate effect.

Features can be changed temporarily without rewriting the contents of the configuration memory (the F4 option). These settings act immediately on exit from CONFIG and remain in force until Nimbus is switched off or reset.

While you are experimenting, you can press F6 to leave CONFIG without changing anything. So you can try using the various choices without worrying about making mistakes. The next section tells you more about the options.

Options

This section gives a summary of the options that are available from the main menu.

Device Allocation

This option (F2) allows you to tell the operating system what floppy disk devices are available to it. This is factory-set to match your Nimbus when you first receive it. If you add any new devices, you must let Nimbus know with this option.

After you have changed the device allocation (and reset or switched off), you will see from the operating system sign-on message that the logical drive names have been changed.

External Interfaces

The printer interface option allows you to set up the Nimbus interface associated with the printer socket on the rear of the computer.

The aux/piconet interface option sets up the Nimbus interface for the socket marked "Aux".

See the "Printers" module for details of these two interfaces.

The mouse and joystick option allows you to define either the presence of a mouse or of one or two joysticks.

Changes to these options take place after you have reset or switched off.

Console Parameters

Various characteristics affecting the screen display can be set.

The F2 key alters screen mode (40 or 80 characters). This influences the number of colours or grey levels (16 with 40-character mode, 4 with 80-character mode).

When you press F4, the video parameters menu appears. You can select a video code with F6, then pressing F8 reveals the colours that can be assigned to that code. You can choose foreground (character) and background colours with the F2 and F4 keys.

The F10 key allows you to select a colour for the border of the screen. This is independent of screen mode.

Border colour can be changed permanently. All other colour settings can be selected only temporarily, and if you change the screen mode with CONFIG, the colours of the previous mode are reset to their default values.

Whenever you enter CONFIG, the colours of both screen modes (but not border colour) are reset to the default values.

The other console parameter choices are:

● the cursor may be defined to be visible or hidden, a rectangle (block) or underscored, flashing, or steady

- the keyboard auto-repeat may be set to either on or off

- the speaker output may be set to on or off

Network Parameters

The recommended Nimbus server address is 144 (decimal). If you have more than one server on your network, the address of each must be different. You can set the Nimbus server address with this option.
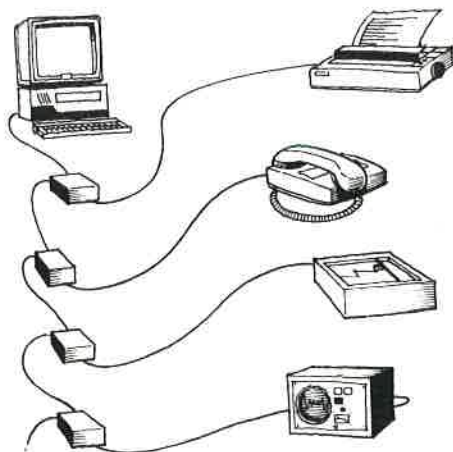
Other Parameters

These are more technical options:

- the size of the silicon disk can be changed

- the first device to be searched for an operating system at start-up can be set

- the self test procedure (performed at start-up) can be set on or off

Chapter 2
Piconet

Piconet is a peripheral expansion system for Nimbus. It allows up to 30 external devices to be connected and controlled from one output port using a series of individually addressable modules.

Nimbus purchasers benefit from the fact that they do not pay for unwanted output capability but they can expand their system by one Piconet module at a time when required.

A Nimbus can also be supplied with an internal Piconet module already fitted to provide a calendar/clock for automatic date and time stamping.

Each additional external device to be connected to Nimbus requires a separate Piconet module, although each module can be reconfigured at any time for different devices. Either serial or parallel modules are available to suit printers, plotters, bit pads, modems and similar devices.

Piconet relies on a series of interfaces; one in each of the modules required for a peripheral. The modules are connected in parallel electrically but are logically independent.

Piconet Modules

The modules are connected in a daisy chain from the Aux socket on the Nimbus rear panel.

A Piconet module consists of a small plastic case about 190 x 110 x 30mm containing a board with the interface circuitry.

You may fit one or more Piconet module boards inside the computer unit if there are expansion slots available.

Power Supply

The power supply unit in Nimbus will allow from two to four additional Piconet modules to be interconnected with up to three metres between modules. Further modules will require an in-line power supply.

The exact number of modules which may be powered from the Nimbus power supply depends on the types of peripherals connected and on the length of cable being used.

Configuring Piconet Modules

A CHAIN 64 utility called PICONFIG enables you to match your Piconet module to the particular devices to be connected. The configuration for the most regularly-used device may be held in the module's configuration memory, other configurations may be kept in a disk file.

Alternatively, PICONFIG can be used to produce an immediate but temporary new configuration on the module.

PICONFIG is described in the "How To Use It" document supplied with the Piconet Module.

Once the Piconet module has been configured to suit a particular device, it can be accessed by all stations on the network.

Piconet Upgrade Kits

Piconet serial modules can take two forms: internal and external. Internal modules fit into an expansion slot in the Nimbus case with internal connections and an external socket for the input/output device. External modules are housed in plastic cases and may be interlinked with up to 3m of cable. A 3m length of cable is supplied. The parallel module is only available as an external module.

A "How To Use It" publication is supplied with each module and, for internal modules, "How to fit it" instructions.

Chapter 3
Upgrades and Options

This section gives information about upgrades that are available to convert any Nimbus into a CHAIN 64 server, and about options that you can buy for your server to enhance the CHAIN 64 network. The upgrade kits and options can be purchased from Research Machines. Contact the Sales Desk on Oxford (0865) 249866.

Except where stated below, follow the instructions supplied with these products. When you are asked to use the module, "How to take it apart" in the RM Nimbus Owners Handbook, please refer to that module. The handbook refers to a Nimbus running under MS-DOS, but the module is independent of operating systems.

Upgrades

The following upgrades may be needed:

- firmware

  The firmware version number of your Nimbus is displayed on the welcome message when you switch on. If the version is earlier than 1.25A, you will need the firmware upgrade kit. This involves fitting two new integrated circuits on the main circuit board of the Nimbus. Instructions are included in the kit.

- memory size

  If your Nimbus has less than 512 Kbytes of main memory (again, see the welcome message), you will need a Nimbus add-on memory board.

This plugs into a socket built into the main board. A range of add-on memory boards are available to give total memory capacities of 640K and 1024K (excluding the 64K graphics memory) for a Nimbus with 128K of memory on its main board, and 768K and 1024K for a Nimbus with 512K of memory on its main board.

The 64K of graphics memory is separate from the main memory. Graphics memory cannot be expanded or used for other purposes.

● network interface

If your Nimbus does not have a network interface socket on the rear panel, you need a network transceiver upgrade kit. This includes a printed circuit board that fits in one of the option board slots of the Nimbus.

Follow the fitting instructions that come with the kit. Once you have installed the transceiver, you will not be able to test the upgraded Nimbus as described in these fitting instructions unless you have also acquired the software and documentation of the Research Machines implementation of Microsoft's Networks Operating System. Instead we suggest that you follow the network setting up instructions in the "Setting Up" module in this handbook.

● 3.5-inch disk upgrade

If you are upgrading a TN, you need a 3.5-inch disk drive upgrade kit. This involves fitting a disk controller board as well as the drive unit.

- winchester disk interface

    If you have a PCN1 or PCN2, you need a winchester disk interface kit. This includes a replacement for your disk controller board. Return the old board to Research Machines.

    When fitting the new board, follow method 2 in the documentation provided.

Options

The following upgrades are available:

- Piconet parallel interface module

    This module enables you to attach a parallel printer to your Nimbus. The instructions include details of how to use PICONFIG to set up the module.

- Piconet serial interface module

    You can attach serial devices to this module. Its interface has a more comprehensive specification than the serial sockets on the rear of the Nimbus.

    Also, the module contains a real-time clock that allows the operating system to obtain the time and date automatically when the computer is switched on.

- additional 3.5-inch disk drive

    You can convert a PCN1 Nimbus to a PCN2 by adding a second 3.5-inch disk drive.

- additional winchesters

    If you have an XN16 Nimbus, you can add one or two additional external winchester disks.

External XW winchester disk units are available
with 16, 40, and 80 Mbytes capacity. The 16 and 40
Mbyte units each contain one winchester disk, and the
80 Mbyte unit contains two 40 Mbyte disks.

An external winchester unit, containing one or two
disks, previously used on an 8-bit Chain network
server or 380Z-D standalone system, can also be used
with the CHAIN 64 server. If it is used in
conjunction with an XN16 Nimbus, it will have to
be returned to Research Machines for an upgrade.
Contact the Sales Office.

If you have a PCN1 or PCN2 Nimbus used as a
CHAIN 64 server, you will have at least one winchester
disk and you can add up to a further three winchester
disks. These disks can be in either XW or Chain 64
(8-bit) cases.

● winchester upgrades

You can upgrade an XW40 unit to an XW80 unit by
the addition of a second winchester disk in its case.

The "How to Use It" instructions that come with these
upgrades have been written for a Nimbus running under
the MS-DOS operating system.

New XW winchester disks leave the factory with
MS-DOS format. To make them work, use the
CHAIN 64 HARDDISK utility to erase the
one MS-DOS partition and to create new
CHAIN 64 partitions.

The CHAIN 64 operating system supports either
one internal winchester disk and one external
winchester disk unit (containing one or two winchester
disks), or two external winchester disk units (each
containing one or two winchester disks).

Chapter 4
Concurrent DOS Commands

This chapter consists of extracts from the Digital
Research "Concurrent DOS 4.1 Users Guide" and it
covers control character commands and Concurrent DOS
commands. These commands are only available on the
Nimbus, not at network stations.

Control Character Commands

These commands are entered by pressing the CTRL key
and another key simultaneously. The following summarizes
the commands:

CTRL/C
  Stops the currently running program.
CTRL/E
  Moves the cursor to the beginning of the next line
  without erasing your previous input.
CTRL/H
  Moves the cursor left one character and deletes the
  character. The same as the Backspace key.
CTRL/I
  Moves the cursor to the next tab stop. Tab stops are
  automatically placed at each eighth column. Same as
  the Tab key.
CTRL/J
  Same as an Enter key.
CTRL/M
  Same as an Enter key.
CTRL/P
  Sends subsequent screen output to the printer and to
  the screen. A second CTRL/P cancels the effect
  of the previous CTRL/P.

CTRL/Q
> Enables screen scrolling after you halt it with
> CTRL/S. Use these two commands to halt
> screen displays that roll by too rapidly.

CTRL/R
> Types a # sign at the current cursor location, moves
> the cursor to the next line, and retypes any partial
> command you have typed.

CTRL/S
> Stops screen output. CTRL/S also stops the program.
> If the display on your screen rolls by too quickly for
> you to read, press CTRL/S. Press CTRL/Q
> to continue output to the screen. The Scroll Lock key
> is easier to use, and it has the same effect.

CTRL/U
> Discards all the characters in the command line that
> you have typed, puts a # sign at the current cursor
> position, and moves the cursor to the next command
> line.

CTRL/X
> Discards all the characters in the command line that
> you have typed and moves the cursor back to the
> beginning of the current line.

Concurrent DOS Commands

The following lists and briefly describes all the
Concurrent DOS commands:

BACK
> Backs up files on hard-disk partitions to floppy disk.

BATCH
> Executes the commands in a file with a BAT file
> extension.

DATE
> Displays and changes the date in European form.

DIR
> Displays the files in a directory.

ERA
Erases files and file password space
ERAQ
Erases files and file password space but questions first.
HELP
Explains Concurrent commands.
INITDIR
Formats CP/M media to allow time and date stamping.
PIP
Copies files between directories and devices.
PRINTER
Changes the current printer number.
REN
Renames files.
REST
Restores files to hard disk partitions from floppy disks.
SDIR
Displays directory and file status information.

SET
Sets file and drive related attributes such as time and date stamping and password protection.
SHOW
Displays information about disk drives.
SPOOL
Controls the printing of files.
STOP
Displays memory allocation and terminates programs.
TYPE
Displays the contents of a text file.
USER
Changes the directory user number on CP/M media.

The following pages contain details of most of these commands.

BATCH

Form

filespec {variable1} {variable2} ... {variable9}
BATCH filespec {variable1} {variable2} ...{variable9}

Explanation

BATCH allows you to invoke a series of commands
contained in a BATCH file by entering a single
command.

Invoking and Interrupting a BATCH File

Invoke a BATCH file by entering the filename with
or without the file extension, which is always BAT, or
use the command BATCH when you want to nest a
BATCH file within another BATCH file.
Variables are optional and are explained below in "Using
Variables in a BATCH File."

You can interrupt a BATCH file while it is executing
by entering a CTRL/C causing the following prompt
to appear:

```
Terminate batch job (Y/N)?
```

If you press Y, batch processing ends and the command
line prompt reappears. If you press N, the current
command ends, but batch processing continues with the next
command in the file.

Creating a BATCH File

Use PIP CON: or an editor such as TXED
(on a network station) to create a BATCH file.
PIP CON: copies information typed at the console

to the file specified. For example the following uses
PIP CON: to create the BATCH file ENDWORK.BAT:

```
A>PIP ENDWORK.BAT=CON:
ERA F:*.BAK
DIR F:
SHOW F:
PIP E:=F:*.*
DIR E:
SHOW E:
```

Press CTRL/Z and <ENTER> to end the file
ENDWORK.BAT.

Once ENDWORK.BAT is created, typing ENDWORK
executes the six commands in the BATCH file in the
order listed.

To invoke a BATCH file from within another BATCH
file, include a command line with BATCH followed
by the name of a BATCH file as one of the commands
to be executed. To chain BATCH files, use the name
of the next BATCH file to be executed as the last
command in the BATCH file. The word BATCH is
unnecessary.

Using Variables in a BATCH File

When creating a BATCH file, you can use variables
as a part of the commands to be executed. Then the
command invoking the BATCH file can contain the
actual values for the variables. Thus, you can create
general purpose BATCH files.

Variables take the form %n, where n is a number from zero
to nine. For example, the variables %0, %1 and %2 are
used in the following BATCH file, SAVE.BAT.

```
A>PIP SAVE.BAT=CON:
COPY %1.BAS %2.BAS
TYPE %0.BAT
```

Press CTRL/Z then <ENTER> to complete the BATCH file.

The command to invoke SAVE.BAT might look as follows:

```
A>SAVE PROGRAM1 B:PROGRAM1
```

SAVE replaces %0, PROGRAM1 replaces %1, and B:PROGRAM1 replaces %2. The command copies PROGRAM1.BAS from the current drive to drive B, then shows the contents of the SAVE.BAT file on the screen.

Remember that you can specify up to 10 variables (%0 through %9). %0 is always the name of the BATCH file itself, and its drive specification, if included. Separate variable values by a space. Ensure that values are entered in the proper sequence.

PAUSE Subcommand

You can insert a PAUSE subcommand in a BATCH file to cause a pause in the processing of the file. The pause allows you to display a message or let an action occur, such as changing disks or aborting the file. The PAUSE subcommand takes the form:

PAUSE {remark}

Besides the optional remark or message, PAUSE always inserts the following message:

```
Strike a key when ready ...
```

The optional remark can contain a maximum of 121 characters. The following example shows a PAUSE subcommand in a BATCH file:

```
PIP STORAGE.BAT=CON:
PIP B:=E:*.*
PAUSE Insert new disk in drive E
PIP B:=E:*.*
```

When STORAGE is run, the disk in drive E is copied. Then the processing pauses and this message appears.

```
Insert new disk in drive E
Strike a key when ready ...
```

Two responses are possible. Insert the new disk and strike any key to continue, or press CTRL/C to terminate the processing.

REM Subcommand

Use REM to display a comment on your screen during BATCH file execution. REM takes the form:

REM {remark}

The maximum length of a remark is 123 characters. The following is an example of REM:

```
REM Archive backup files for security.
```

DATE

Form

        DATE
        DATE SET {DD/MM/YY}
        DATE C
        DATE V

Explanation

The DATE command displays or sets the date and time. Concurrent DOS contains an internal clock that increments the date and time.

The DATE command is used to set the values from which the operating system starts. You must set the date and time each time that you start or reset your computer, unless it is equipped with a battery-driven clock on a Piconet module.

Concurrent DOS maintains the internal clock for two reasons:

- to provide you and your applications continuous access to the date and time

- to have the time available for file time and date stamping

Time and date stamping records the current time and date whenever you create, access, or update a file. However, you must run the INITDIR and SET commands first. See the descriptions of these commands for more information on time and date stamping.

If you do not enter the date, the operating system assumes one. The assumed date varies with the Concurrent DOS release.

To display the current setting, type:

DATE

the current date and time is displayed in European format. You can use:

DATE C

to obtain a continuous display of the date and time at the top of the screen. You can terminate continuous display by pressing any key.

To change the current setting, use:

DATE dd/mm/yy {hh/xx}

where:

- dd is a one or two-digit number from 1 to 31 indicating the day

- mm is a one or two-digit number from 1 to 12 indicating the month

- yy is a two-digit number from 85 to 99 indicating the year

- hh is a one or two-digit number from 0 to 23 indicating the hour (24-hour clock)

- xx is a one or two-digit number from 0 to 59 indicating the minute

You do not have to enter leading zeros, and you can use any separator between the numbers (except a space). For example:

DATE 20,11,85 10:15

sets the date to 20th November 1985 and sets the time to 10.15 am

If you type:

`DATE SET`

You will be prompted for a date setting then a time setting.

To obtain the version number of the DATE utility, type

`DATE V`

and the version number, the date of its origination, and the current date and time will be displayed.

DIR

Form

DIR {d:}{filespec}{/L}{/S}{/P}

Explanation

DIR displays the contents of a disk directory. DIR
with no parameters displays all files with the DIR
attribute in the current drive's directory. Files with
the SYS (system) attribute are not shown. See the
SET command explanation for a description of the DIR
and SYS attributes.

DIR shows the directory contents of the current
drive unless you specify another drive. DIR shows
only the files in the current user number.

You can select a file or class of files for display by
entering a specific file specification or a general file
specification using the wildcard characters (* and ?).
For example, you can enter:

```
A>DIR SET.CMD
```

to have DIR search the current directory for the
SET.CMD file. If it is unsuccessful, the following
message is displayed:

```
File not found
```

Besides the list of files, the DIR display shows
the following information about the current directory:

- drive selected

- number of files found

- amount of storage space left, in bytes

- whether files with the SYS attribute are recorded on the directory

There are three DIR options. They can be entered individually or in combination, and in any order. The list below describes these options.

/L

> Displays the files selected, their size in bytes, and the date and time that each file was last written to. The date and time fields are not displayed if date and time stamping is not enabled.

/P

> Forces the display to pause with every full screen. The display proceeds when you press any character.

/S

> Displays files with the SYS attribute and indicates whether files with the DIR attribute are recorded on the directory.

Examples

```
A>DIR C:/S
```

This command displays all files with the SYS attribute in drive C's current directory.

```
A>DIR *.CMD/L/P
```

This command displays all files with the CMD file extension in drive A's current directory. It uses the long format, giving information on size and date and time stamping. The display pauses with each full screen.

```
A>DIR *.
```

This command displays all files and subdirectories that do not have an extension. If the period is not entered DIR lists all files.

ERA

Form

ERA filespec

Explanation

The ERA command removes the specified file or files from the directory. The file specification can identify a particular file, or it can indicate a group of files with the wildcard characters * and ?.

After you erase a file, you cannot retrieve it, so you should be particularly careful when you use wildcards in your file specifications. Generally, ERA does not query you before erasing files. However, it does query you when you use the asterisk wildcard for both the filename and the extension (*.*). For *.* it displays the following query.

`Are you sure (Y/N)?`

Type Y to erase all files on the drive; type N to abort the command.

You can erase files only in the current user number on the current or designated drive.

ERAQ

Forms

ERAQ filespec {[XFCB]}

Explanation

The ERAQ command erases files or file password space. Also, it queries before erasing a file to ensure the erasure is truly wanted.

ERAQ is most useful when used with the wildcard characters * and ? to erase an entire class of files. Instead of erasing every file that matches the file specification, ERAQ lists the specified files individually, followed by a ? prompt, to which you respond either with a Y or Yes (erase the file) or with an N for No (do not erase the file).

Use the XFCB option only if you no longer want protection for a file or set of files, and you want to free the space used in the directory by passwords for these files. The XFCB option does not erase the files, only the space allocated for the passwords.

When you use the XFCB option, a prompt requests the password of each file. If you have forgotten the password or do not want the prompting, use the SET command before using this option. See the SET command in this section.

Note: You must have ERAQ.CMD in the current directory or on the system drive (with the SYS attribute set) to use the ERAQ command.

HELP

Form

HELP {topic}

Explanation

The HELP command displays information about the following utilities:

BACKREST CONFIG FORMAT HARDDISK
PICONFIG WHO

When you enter:

HELP

the entire list of topics is displayed and you can select one of the topics by entering its name. You need not enter the entire topic name, but you must enter enough letters to uniquely identify it.

You can display information directly HELP {topic}. For example, if you want to see the information on HARDDISK, type:

HELP HARDDISK

INITDIR

Form
INITDIR {d:}

Explanation

Use the INITDIR command to format a directory for time and date stamping.

After you run INITDIR, you must run the SET command to turn on time and date stamping. See the SET command description for these instructions.

Time and date stamping tells you the time and date a file was created, modified, or accessed. Use DIR/L or SDIR to display this information after the directory is prepared with INITDIR.

For more information, see the description of the SET command time stamp options, ACCESS, CREATE, and UPDATE. INITDIR formats the directory for all user numbers on the drive designated.

When INITDIR reformats the directory area, it saves all current entries. However, you must have at least one fourth of the total directory space available to run INITDIR successfully. If the directory does not contain enough space, INITDIR displays the following message:

```
ERROR: Not enough room in directory
```

To use INITDIR, enter the command followed by the designation of the drive containing the disk. If you do not specify a drive name, INITDIR initializes the current drive. For example, the following command initializes the directory on drive D.

```
A>INITDIR D:
```

If the designated disk is password-protected,
INITDIR displays the message:

```
Directory is password-protected
Password, please. >
```

Enter drive label password and press Enter. If you do not
enter the correct password, INITDIR terminates.

INITDIR requires you to confirm your intentions
before proceeding, as follows:

```
INITDIR WILL ACTIVATE TIME STAMPS
FOR SPECIFIED DRIVE
Do you want to reformat the directory on
drive: D (Y/N)?
```

If the directory is already formatted for time and date
stamps, INITDIR displays the message:

```
Directory already reformatted
Do you want to recover time/date space (Y/N)?
```

Press Y to recover the space reserved for time and date
stamping. The file entries in the directory are saved,
but you can no longer use the time and date stamping
feature unless you run INITDIR again. If you press
N to leave the extra directory space as it is, the
following message appears.

```
Do you want the existing time and date
stamps cleared (Y/N)?
```

Press Y to erase the current time and date values for all
files. However, you can still use the time and date
feature after this option is selected. Press N to leave
the time and date information intact and terminate
INITDIR.

PIP

Form

      PIP destination=source
      PIP

Explanation

Use PIP (Peripheral Interchange Program) to copy
files between drives, directories, and devices. Both the
destination and source in the PIP command can be a device
rather than a specific file.

For a description of using these devices with PIP, see
"Copy Files to and from Devices" in this section. When
there is a file on the destination with the same file
specification, PIP erases the old copy only after the
new copy has been created.

PIP copies files incrementally into a temporary file.
The temporary file is given the filename specified for the
destination, but PIP substitutes the file extension $$$.
PIP changes the temporary extension $$$ to the proper
file extension only after the copy is completed.
Consequently, if the copy fails or is interrupted by
CTRL/C the destination file with the same specification
is not destroyed. In this case, the incomplete $$$ file
also appears on the disk.

When you enter PIP alone, the PIP asterisk prompt
is displayed. You can then enter multiple PIP commands.
See "Multiple Command Mode" in this section for a
description of this form of the PIP command.

Using Options with PIP

PIP options enable you to process your source file in special ways. See the following table for a listing and description of PIP options. In the options, n represents a number and s represents a sequence or string of characters teminated by a CTRL/Z.

Except for the Gn option, all options follow the source specification. Options must be enclosed in square brackets, []. For those options that require a numeric value, no blanks can occur between the letter and the value. However, a space can be inserted to separate one option from another. All options must be specified in a single set of square brackets.

A
> Copies only the files that do not have the Archive flag set. Use this option with wildcards to copy only the files that have been modified since the last PIP with [A] command.

C
> Asks for confirmation before each file is copied.

Dn
> Deletes any characters past column n. Use this option for a source file with lines that are too long to be handled by the destination device (for example, an 80-column printer or console).

E
> Echoes transfer to the computer screen. Use this option to display file contents as the copy is taking place. The source file must be a test file.

F
> Filters formfeeds. Use this option to remove all formfeed characters embedded in the source file.

Gn
> Goes to or from user number n. This is the only option that can be used with both the source and destination file specifications. When this option follows the destination name, PIP copies the file into

the user number specified by n. When this option follows the source name, PIP copies the file from the user number specified by n. In both cases, the user number must be in the range 0 to 15.

H   Transfers Hex data. Use this option to check all data for the proper Intel hexadecimal file format. Errors are displayed as they occur.

I   Ignores :00 records in the transfer of Intel hexadecimal file format. The I option automatically sets the H option.

L   Translates uppercase characters in the source file to lowercase in the destination file.

N   Adds line numbers to the destination file. Use this option to add sequential line numbers to each line copied. A colon follows the line number. If you enter N2 instead of N, PIP adds leading zeros to the line number and inserts a tab after the number.

O   Transfers machine code (non-character) files. PIP ignores any CTRL/Z end-of-file characters during concatenation and transfer. Use this option only if you are combining object code files.

Pn   Sets page length where n specifies the number of lines per page. When your destination is LST:, use this option to send a page eject at the beginning of the file and at every n lines. If n = 1 or is not specified, PIP inserts page ejects every 60 lines. When you also specify the F option, PIP ignores formfeeds in the source data and inserts new formfeeds in the destination data at the page length specified by n.

Qs   Quits copying from the source device after the character string s. Use the Q option with or without the S option to copy only a portion of the source

file. The quit character string must be terminated by CTRL/Z in your command line. The quit character string is included in the destination file. If the quit string contains lowercase letters, you must enter the command from the PIP interactive mode. See "Multiple Command Mode" in this section.

R   Reads system (SYS) files. Normally, PIP does not copy files with the SYS attribute. This option overrides this restriction.

Ss   Starts copying file from the character string s. The start character string must be terminated by CTRL/Z. The Ss option, used with or without the Q option, can copy a portion of a file. The start string is included in the destination file. If the character string contains lowercase letters, the command must be entered from PIP's interactive mode. See "Multiple Command Mode" in this section.

Tn   Expands tabs. Use this option to expand tab characters in the destination file. PIP replaces each tab with enough spaces to position the next character in a column divisible by n.

U   Translates lowercase characters in the source file to uppercase in the destination file

V   Verifies that data has been copied correctly. PIP compares the destination to the source data to ensure that the data has been written correctly. The destination must be a floppy disk or hard disk file. Using this option increases copy time.

W   Writes over files with RO (Read/Only) attribute. Normally, if a PIP command includes an existing RO file as a destination, PIP sends a query to the existing file. When this option is specified,

PIP overwrites the RO file without the console prompt. If the command contains multiple source files, this option need follow only the last file in the list.

Z

Zeros the parity bit. Use this option to set the parity bit of each data byte in the destination file to zero. The source file must be a text file.

Examples

```
A>PIP NEWPROG.LTR=CODE.LTR[L],DATA.LTR[U]
```

This command constructs the file NEWPROG.LTR on drive A by concatenating (joining) the two files CODE.LTR and DATA.LTR from drive A. During the copy operation, all CODE.LTR characters are translated to lowercase (L) and all DATA.LTR characters are translated to uppercase (U).

```
B>PIP LST:=PROGRAM.LTR[NT8U]
```

The above command copies the file PROGRAM.LTR from drive B to the printer. The N option tells PIP to number each line. The T8 option expands tabs to every eighth column. The U option translates lowercase letters to uppercase.

```
A>PIP
*PORTION.TXT=LETTER.TXT[SDear Sir↑ZQSincerely↑Z]
```

The above command sequence extracts from the file LETTER.TXT the portion that starts with the character string "Dear Sir" and ends with the character string "Sincerely". The corresponding file contents are copied to he file PORTION.TXT. Remember that when the beginning or ending string does not contain all uppercase characters, you must use PIP's multiple command mode rather than a PIP command line.

```
B>PIP B:=A:*.CMD[VWR]
```

The above command copies all files with file extension
CMD from drive A to drive B. The V option tells PIP to
verify each destination file with its source file for an
exact match. The W option lets PIP overwrite any
destination files marked R/O (Read/Only). The R option
tells PIP to read files from drive A marked with the
SYS (System) attribute.

Single File Copy

Form

    PIP d:{[Gn]}=filespec{[options]}
    PIP filespec{[Gn]}=d:{[options]}
    PIP filespec{[Gn]}=filespec{[options]}

Explanations

Use this PIP command form to copy a file from one
disk drive to another, from one directory to another, or
to make a copy of the file in the same directory.

The Gn option in the above command form refers to user
numbers. User numbers are used to identify subdivisions
of a disk's directory.

The first command form above is the simplest way to copy a
file. PIP looks for the file named by filespec on the
default or designated drive and copies it to the drive
specified by d:, giving it the same name it has on the
source drive. You can use the [Gn] user number option to
place your destination file in the user number specified
by n.

In the second command model, PIP copies the file named
in the destination specification from the source drive to
the destination drive. If a destination drive is not
specified, the copy is made to the current drive.

The third form copies and renames a file.

Before you start PIP, use the SHOW command to make sure that you have enough free space on your destination disk. Even if you are replacing an old copy, PIP needs enough room for the new copy before it deletes the old copy.

The source file DIR, SYS, RW, and RO attributes and password are copied with the file. See the SET command for a description of file attributes. If you want to copy a file that has a SYS attribute, you must use the PIP [R] option in the source specification.

If the existing destination file is set to Read/Only, PIP displays the prompt.

```
DESTINATION IS R/O, DELETE (Y/N)?
```

Answer Y to erase the existing version on the destination; enter N to abort the copy operation. If you know that the destination is R/O but you want to replace the file anyway, enter the source specification with the [W] option.

Examples

```
PIP B:=OLDFILE.DAT
A>PIP B:OLDFILE.DAT=A:
```

Both forms of this command cause PIP to read the file OLDFILE.DAT from drive A and copy it to drive B.

```
A>PIP B:NEWFILE.DAT=OLDFILE.DAT
```

The above command copies the file OLDFILE.DAT from drive A to drive B and renames it NEWFILE.DAT. The original file remains OLDFILE.DAT on drive A.

```
A>PIP NEWFILE.DAT=OLDFILE.DAT
```

The above command copies the file OLDFILE.DAT into the same directory but renames it NEWFILE.DAT. This gives you two copies of the same file in one directory.

```
A>PIP B:PROGRAM.BAK[G1]=A:PROGRAM.DAT
```

The above command copies the file PROGRAM.DAT from user number 0 on drive A to user number 1 on drive B, and renames the destination file to PROGRAM.BAK.

Multiple File Copy

Form

PIP d:{[Gn]}=filespec{[options]}

Explanation

You can use the wildcards (* and ?) in your source file specification to copy a group of files one by one. As each file is copied, a message is displayed indicating the name. The files retain their original name on the destination drive.

The options field in the source specification allows you to use the PIP [A] (Archive) option. This is handy when you want to copy only those files changed since the last time you used PIP to back up your files. See the description of the archive attribute in the SET command in this section.

Examples

A>PIP B:=A:*.CMD[RW]

This command copies all the files on drive A with the CMD file extension, including those with the SYS attribute, to drive B.

Combining Files

Form

PIP filespec{[Gn}]=filespec{[options]},
filespec{[options]}{...}

Explanation

This form of PIP combines a number of files, in the
order named, into a single file named in the destination
filespec. The first character of each source file is
appended directly to the last character of the previous
source. This form allows you to specify different options
for each source file.

Examples

```
A>PIP NEWFILE=FILE1,FILE2,FILE3
```

This command copies the files FILE1, FILE2 and
FILE3 on drive A into the file NEWFILE also
on drive A.

```
A>PIP B:X.LTR=Y.LTR,B:Z.LTR
```

The above command copies the file Y.LTR on drive A
and the file X.LTR on drive B into the file X.LTR on
drive B.

Multiple Command Mode

Form

PIP

Explanation

This form of the PIP command starts the PIP utility
and lets you type multiple command lines while PIP
remains in user·memory. PIP prompts with an asterisk

on your screen whe it is ready to accept input command lines. You can type any valid command line described under previous PIP formats at the asterisk prompt.

To stop this form of the PIP command, press the Enter key when the PIP prompt is displayed. The empty command line tells PIP to discontinue operation.

Note: You can change disks between your PIP commands. However, make sure that the PIP prompt is displayed before switching disks.

Example

```
A>PIP
*NEWFILE=FILE1,FILE2,FILE3
*APROG.CMD=BPROG.CMD
*A:=B:X.LTR
*B:=*.*
*PRN:=B:FUNFILE.SUE
*<ENTER>
A>
```

The first command in this sequence loads the PIP program and displays the PIP prompt. The subsequent commands are all valid PIP commands described in this section.

Copy Files to and from Devices

Form

PIP dev:=filespec{[options]}
PIP filespec{Gn}=dev:
PIP dev:=dev:

Explanation

This form of the PIP command line lets you copy a file from a floppy or hard disk to a device (dev:), from a device to a floppy or hard disk, or from one device to

another. The files must contain ASCII characters; you cannot copy program files in this manner. Devices are designated by the names CON:, LST:, NUL:, EOF:, and PRN:.

The logical device names are as follows:

- CON: The console; the physical device assigned to CON:. When used as a source, CON: is usually the keyboard; when used as a destination, CON: is usually the screen.

- LST: The destination device assigned to LST:, usually the printer.

There are three device names that have special meaning:

- NUL: A source device used for paper tape readers that produces 40 nulls (hexadecimal zeros).

- EOF: A source device that produces a single CTRL/Z (the Concurrent end-of-file mark).

- PRN: The printer device with the following defaults: tab expansion to every eighth column; line numbers; and page ejects every 60th line.

Examples

```
A>PIP B:FUNFILE.SUE=CON:
```

when CON: is specified as the source, your keyboard entries are recorded in the destination file specification, in this case FUNFILE.SUE on drive B. Type CTRL/Z to stop PIP and close the file.

```
A>PIP LST:=CON:
```

When CON: is specified as the source and LST:
as the destination, your keyboard entries are written to
the printer.

`A>PIP LST:=B:DRAFT.TXT[T8]`

The above command copies the file DRAFT.TXT on drive
B to the printer. The T8 option expands tab characters to
every eighth column.

PRINTER

Form

PRINTER
PRINTER n

Explanation

The PRINTER command displays or sets the server's current printer number:

- 0 is a serial printer connected to the Nimbus's printer socket

- 1 is either a serial printer connected to the Nimbus's Aux/Piconet socket, or a serial or parallel printer connected to a Piconet module

- 2 to 16 are serial or parallel printers connected to Piconet modules

When you type PRINTER alone, Concurrent DOS displays the current printer number. When you enter PRINTER followed by a number, Concurrent DOS changes the current printer and display the new assignment. For example:

```
A>PRINTER 3
Printer Number = 3
```

REN

FORM

```
REN{AME} oldfilespec newfilespec
```

Explanation

The REN command lets you change the name of a file. If the file to be renamed is not on the current drive, you must precede the old file specification with the correct drive specification. The following command line renames MYFILE.TYP as FILE1.TXT:

```
A>REN B:MYFILE.TYP FILE1.TXT
```

On drives with password protection enabled, you must enter the default password before renaming a file. The same file password is then required to access the new file specification. Alternatively, you can remove the password protection on the file before renaming it (see the SET command in this section).

The wildcard characters * and ? can be used in file specifications as follows:

```
B>REN *.IN *.OUT
```

The above command renames all files with the file extension IN so that they have the file extension OUT.

REN does not let you rename a file to a name that already exists. If you attempt to do this, the message:

```
File not renamed
```

is displayed and the command-line prompt is returned. Any files designated to be renamed remain unchanged.

SDIR

Forms

SDIR
SDIR filespec{,filespec ... }
SDIR [option{,option ... }}
SDIR filespec{,filespec ...}[option{,option ... }]

Explanation

When no options are selected, the SDIR command
displays all files, including those with the SYS
attribute, in the current user number, on the current or
specified drive. Files are listed in alphabetical order
by filename and file extension. Each file listing also
shows the amount of space used by the file and the file's
attributes. At the bottom of the display, SDIR
provides totals related to the files listed.

When you enter one or more file specifications, SDIR
looks in the current user number on the current or
specified drive for files that match your entries. The
wildcard characters, * and ?, can be used to select a
class of files.

The following list explains the column headers shown in
the SDIR display. Entries with an asterisk only
appear when the drive has a label.

Name
    Filename and extension.
Bytes
    The number of kilobytes allocated to the file.
Recs
    The number of 128-byte records allocated to the file.
Attributes
    The attributes set for the file. See the SET
    command in this section for a description of file
    attributes.

Prot*

> The file's password protection mode. The mode determines what applications you can perform on the file. Possible values are READ, WRITE, DELETE, and NONE.

Update*

> Indicates when the file was last modified.

Create*

> Indicates when the file was created.

Access*

> Indicates when the file was last used.

Total Bytes

> The total kilobytes allocated to all the files listed.

Total lk Blocks

> Indicates the total number of 1-kilobyte blocks required to store the files listed on a single-density disk or any other storage medium with a block size of 1 kilobyte.

Total Records

> The total number of 128-byte records allocated to the files listed.

Files Found

> The total number of files listed.

Used/Max Entries

> Indicates the number of directory entries allocated to the files and the maximum number of directory entries available for the designated drive. Note that longer files require more than one directory entry.

SDIR Options

SDIR options affect all files in a command line. They can be used with or without a file specification.

More than one option can be specified in a command line. Options must be separated by commas and enclosed in a single set of square brackets.

SDIR allows up to 10 file specifications on a single command line. SDIR ignores passwords. When you enter a drive specification without a file specification, SDIR displays all the files on the drive.

The following list describes the SDIR options. Notice that many of them have abbreviated forms. Examples illustrating their use follow the list.

SYS
> Displays only those files that have the SYS (System) attribute set.

RO
> Displays only those files that have the R/O (Read/Only) attribute set.

DIR
> Displays only those files that have the DIR (Directory) attribute set.

RW
> Displays only those files that have the R/W (Read/Write) attribute set.

XFCB
> Displays only those files that are password-protected. XFCB is an extra directory entry allocated to a file by Concurrent when you give it a password.

NONXFCB
> Displays only those files that do not have a password.

USER=n
> Displays the files in the user number specified by n. Specify multiple user numbers by enclosing them in parenthesis and separating them with commas.

USER=ALL
> Displays the files in all user numbers.

DRIVE=d
> Displays the files on the drive specified by d. Specify multiple drives by enclosing them in parenthesis and separating them with commas.

LENGTH=n
> Displays n lines of filenames before inserting an SDIR table heading, where n must be in the range 5 to 65536.

SIZE

> Displays the number of kilobytes allocated to each file.

FF

> Sends an initial formfeed to the printer. This option is useful only when you use the Concurrent CTRL/P option to print an SDIR display. If the LENGTH option is also specified, a formfeed is issued after every n lines.

MESSAGE

> Displays the drive, user number, and message "File not found" of empty directories during searches for files on more than one drive and/or user number.

NOSORT

> Displays the files in the order they appear in the directory, rather than alphabetically.

EXCLUDE

> Displays only those files that do not match the files entered. Use this option with one or more file specifications.

Examples

```
A>SDIR *.CMD *.LTR[USER=ALL,LENGTH=15]
```

This command searches through all user numbers on all drives accessed since the last computer reset and lists all files with the CMD or LTR file extension. The files are listed 15 lines at a time with header and summary information provided with each group.

```
A>SDIR *.CMD[XFCB,DRIVE=(A,D)]
```

The preceding command displays the size of all files on drive D with the RW (Read/Write) attribute.

```
A>SDIR *.CMD[XFCB,DRIVE=(A,D)]
```

The preceding command displays all CMD files that are password protected on drives A and D.

```
A>SDIR C:*.CMD,*.DAT[NONXFCB,EXCLUDE,USER=(3,4,5,15)]
```

The preceding command displays all files on drive C in user numbers 3, 4, 5 and 15 that are not password-protected and do not have the CMD or DAT file extension.

SET

Form

SET [options]
SET d: [options]
SET filespec [options]

Explanation

The SET command initiates password protection and time stamping of files and establishes the drive and file attributes such as Read-Only, SYS, or archive attributes. SET also lets you label a floppy disk or winchester drive and password-protect the label. Before enabling the time stamping option, you must first format the floppy disk or winchester drive directory. See INITDIR in this section, for information on directory formatting.

Assign a Label to the Drive

Form

SET {d:} [NAME=labelname.typ]

Explanation

The SET command assigns a name to the specified drive's directory, or to the default drive's directory if no drive is listed. You can create a directory label with an eight character name and three character type, similar to filename and file extension. For example, the command:

```
A>SET [NAME=DISK100]
```

labels the disk on the current drive, DISK100. The default label name is LABEL.

Enable/Disable Password Protection

Form

        SET [PROTECT=ON]
        SET [PROTECT=OFF]

Explanation

The first form of this SET command assigns the password to the drive label. The second form of the command removes the password protection from the label.

If a label has no password, any user who has access to the SET program can set other attributes to the drive, that might make the drive files inaccessible to you. However, if you assign a password to the label, you must also supply the password to set any of the functions controlled by the label. SET always prompts for the password if the label is password protected. You can use SHOW to display the label to determine if a drive is password protected. See SHOW in this section.

When you assign or change any password on a drive, you must enter the commands in a specific order. You must switch password protection on as described above, before you can assign a password. After protection is switched on, set the password like this:

A>SET [PASS=XYZ]

Once the drive has the protection turned on and the password set, it prompts you for the password whenever you access that drive or label.

If you use password protection, for a label or for files, be sure to record the passwords. If you forget the password, you lose access to any protected files.

Assign Passwords to Files

Form

SET filespec [PASSWORD=password]

Explanation

This command sets the password for a file to the password that you specify with the PASSWORD option. Passwords can be up to eight characters long. Lowercase letters are translated to uppercase. For example:

```
A>SET MYFILE.TEX [PASSWORD=myfil]
```

assigns the password MYFIL to the file MYFILE.TEX.

You can use the asterisk and question mark wildcard characters in the filename and file extension fields of the file specification. SET assigns the specified password for all files that match the wildcard file specification.

Set Password Protection Mode

Form

SET filespec [PROTECT=READ]
SET filespec [PROTECT=WRITE]
SET filespec [PROTECT=DELETE]
SET filespec [PROTECT=NONE]

Explanation

You can assign one of four password protection modes – READ, WRITE, DELETE and NONE – to your files. The list below describes each mode.

READ
The password is required for reading, copying, writing, deleting or renaming the file.

WRITE

> The password is required for writing, deleting or renaming the file. You do not need a password to read the file.

DELETE

> The password is required only for deleting or renaming the file. You do not need a password to read or modify the file.

NONE

> No password exists for this field. If a password exists, this modifier is used to delete the password. For example:

```
B>SET *.TEX [PASSWORD=SECRET, PROTECT=WRITE]
```

> assigns the password SECRET to all the TEX files on drive B. Each TEX file is given a WRITE protect mode to prevent unauthorized editing.

Assign a Default Password

Form

SET [DEFAULT=password]

Explanation

This command assigns a default password that the system uses during a given session. The system uses the default password to access password protected files if you do not specify a password. The system lets you access the file if the default password matches the password assigned to the file.

For example:

```
A>SET [DEFAULT=dd]
```

instructs the system to use dd as a password if you do not enter a password for a password-protected file.

SET Time Stamp Options

Forms

SET [CREATE=ON]
SET [ACCESS=ON]
SET [UPDATE=ON]

Explanation

These SET commands allow you to keep a record of the times and dates when users created, accessed, or updated their files. However, before you enable time stamping on your files, you must first run INITDIR to format the drive directory for time and date stamps. See INITDIR in this section. You must also use the DATE command each time you run Concurrent to set the correct time.

The CREATE option allows you to record the creation time of a file. It turns on the CREATE time stamp on the current drive or on a specified drive. You must turn the option on before you create the file to be time stamped.

The ACCESS option turns on the ACCESS time stamp on the current or specified drive. ACCESS and CREATE are mutually exclusive, only one can be in effect at any given time. If you turn on the ACCESS time stamp for a disk that has CREATE active, the CREATE time stamp is turned off.

The UPDATE option turns on UPDATE time stamps on the current drive or specified drive. UPDATE records the last time you modified, or updated, your file.

Although there are three kinds of time and date stamps, only two can be associated with a file at one time. Also, time and date stamps cannot be selectively assigned to individual files. Either all files on a disk are stamped, or none at all.

If you set both UPDATE and CREATE, both stamps
are changed when you edit a file. This occurs because
word-processing and text editing programs do not update
the original file, but create a new version with the same
name. For example, if you have ACCESS time stamps turned
on and you enter the command:

```
A>SDIR [FULL]
```

Concurrent displays time and date stamps in the following
format:

Name		Bytes	Recs	Attributes	Prot	Update	Access
ONE	.TEX	9K	71	Dir RW	None		08/03/82 10:56
TWO	.TEX	12K	95	Dir RW	None		08/05/82 15:45
THREE	.TEX	10K	76	Dir RW	None		08/10/82 09:30

The ACCESS time stamps displayed show the time the
file was last displayed or edited. Note that displaying a
filename in a directory listing does not constitute an
access and is not recorded.

If you turn on CREATE and UPDATE, the display
includes CREATE and UPDATE in the columns at the
right, as shown below.

Name	Bytes	Recs	Attributes	Prot	Update		Create	
GENLED.DAT	109K	873	Dir RW	None	08/05/82	14:01	08/01/82	09:00
RECEIPTS.DAT	59K	475	Dir RW	None	08/08/82	12:11	08/01/82	09:45
INVOICES.DAT	76K	608	Dir RW	None	08/08/82	08:46	08/01/82	11:36

Set Drive and File Attributes

Form

SET {d:} [RO]
SET {d:} [RW]
SET {d:} filespec [RO]
SET {d:} filespec [RW]
SET {d:} filespec [SYS]
SET {d:} filespec [DIR]

Explanation

These SET commands set the specified drive or file(s)
to Read/Only, Read/Write, Sys, and Dir. If your drive
is password protected and protection is on, the system
asks you for your password.

If a drive is set to Read/Only, PIP and COPY cannot
copy files to it, ERASE and DEL cannot delete a
file from it, and REN cannot rename it. You cannot use
any program to make changes to it. When a file is set to
Read/Write, you can read it and write to it. You can use
wildcards in a SET command so that you can set
attributes for more than one file with a single command.

The SYStem and DIRectory attributes apply only
to files. DIR is the default file attribute and the
DIR command displays all files with this attribute.

Setting a program file on the system disk to SYS
allows you to access that program from any user number or
directory on the drive. To display files set to SYS,
use the SDIR command or the DIR command with the
/s option.

You can also use SET to set the Archive attribute
for files. When the Archive attribute of a file is on,
the file has been backed up. Using SET, you can turn
the Archive attribute on or off with the following
commands:

```
SET MARVELL.TXT [ARCHIVE=ON]
SET MARVELL.TXT [ARCHIVE=OFF]
```

You can also turn the Archive attribute on by copying a group of files using PIP with the A option. With the A option, PIP requires a wildcard file specification. PIP copies only those files matching the specification that have not been changed since the last time they were backed up with the A option. For each file that is successfully copied, PIP sets the Archive attribute to on. The Archive is displayed by SDIR.

The SET [HELP] Option

Form

SET [HELP]

Explanation

Type the above SET command to obtain a screen full of SET examples that cover all of the uses of SET.

Additional SET Examples

```
A>SET *.LTR [SYS,RO,PASS=123PROT=READ]
A>SET *.LTR [RW,PROTECT=NONE,DIR]
```

The first command affords the most protection for all the files with a file extension of LTR on drive A. The password protection is set to READ, therefore you cannot even read one of the LTR files without entering the password 123 (unless the default password is set to 123).

The second command reverses the protection and access attributes of the LTR file. Anyone can read and write the files; no password is required. However, the system prompts you for the password before it allows you to turn off the password protection.

SHOW

Form

SHOW {d:}
SHOW {d:} option {,option...}

Explanation

Use SHOW to display disk drive characteristics and
status. The drive requested can be a floppy disk or a
winchester partition. The list below describes the
SHOW options.

SPACE

Displays the remaining space available for file
storage on a drive or drives. SHOW SPACE
also indicates whether the disk is Read/Write or
Read/Only.

DRIVE

Displays drive recording characteristics. The values
shown in the following example for a floppy disk drive
represent the total available and not the amount in
use.

```
   A:  Drive Characteristics
2528:  128 Byte Record Capacity
 316:  Kilobyte Drive Capacity
  64:  32 Byte Directory Entries
  64:  Checked Directory Entries
 256:  Records / Directory Entry
  16:  Records / Block
   8:  Sectors / Track
   1:  Reserved Tracks
```

USERS

Displays the current user number and all user numbers
with files recorded in them.

LABEL
>   Displays a drive's label and password status, and the time and date when the label was created. For a description of drive options, see the SET command.

HELP
>   Displays a summary of the SHOW command syntax.

Note: Unless you specify a drive (d:), SHOW displays the option information for all drives accessed since the last computer reset.

STOP

Form

STOP
STOP program name

Explanation

Use the STOP command to display the programs that are running and to terminate a program. The first form of the STOP command lists the programs running and displays status information regarding the amount of memory used by each program. This form also prompts you to terminate any of the programs listed in the display. To terminate a program, enter the number assigned to it and press Enter. To exit STOP without terminating a program, press Enter.

The second form of STOP terminates only the program specified; no memory allocation information is displayed.

When you issue the STOP command, you see the information listed below:

Entry Number
> Numbers are given by the STOP command to all programs running. The numbers are sequential: the highest number indicates the first program invoked and the lowest indicates the most recent program invoked. STOP always appears first on the list with the designation * *.

Program Name
> The name of the program running.

Memory Used
> The amount of memory used by the program.

Contiguous Blocks of Free Memory
> A list of the contiguous blocks of memory remaining and the amount of memory in each block. Depending on how your programs use memory, you might have one large block or a number of smaller blocks. The first number

in each line indicates the starting memory address.
The rightmost number indicates the amount of memory in
the block.

Total Free Memory

The total amount of memory remaining. This number is
derived by adding up the amount of memory in each
contiguous block. In some ways this is a misleading
value because most programs require contiguous memory
to run.

Enter the Number to delete or RETURN to exit

This prompt allows you to terminate a program or
return to the Concurrent command line prompt.

How to Terminate a Program

Normally, you should use the termination command procedure
described in your program's manual because it saves the
information you have entered.

Use the STOP command to terminate a program only if
the normal termination command cannot be performed. Find
the program's number in the display, type that number, and
press the Enter key.

TYPE

Form

TYPE filespec

Explanation

The TYPE command displays the contents of a text file on your screen. The file specification must contain the filename and file extension. If the file is password-protected for READ mode, the specification must also include the password. The wildcard characters (* and ?) cannot be used.

Press CTRL/S to stop the display from scrolling. To restart scrolling, press CTRL/Q. Press CTRL/C to abort the display.

Press CTRL/P to have the file contents sent to the printer as well as the screen. Press CTRL/P again to stop output to the printer. Note that screen output continues to be sent to the printer after the TYPE command has completed until you press CTRL/P.

USER

Form

USER {n}

Explanation

The USER command displays or changes the current user number. The directory for a disk or winchester drive can be divided into sixteen different directories, each designated by a user number in the range 0 to 15.

The default user number is 0. When Concurrent starts, it assumes that 0 is the current user number. With the exception of user 0, Concurrent displays the current user number in the system prompt. The current user number precedes the drive specifier as in the following example:

`3A>`

To display the current user number, type the following command:

`A>USER`

To change the current user number to 8, type the following command:

`A>USER 8`

The system responds with:

```
User Number = 8
8A>
```

To obtain a list of user numbers that have files associated with them, type:

`A>SHOW USER`

Chapter 5
The BackRest Utility

Introduction

BackRest is a program for saving files from a winchester disk onto a set of floppy disks and for restoring them back from the floppy disks onto the winchester, should this be necessary.

BackRest has been developed and licensed for distribution by Digital Research by written agreement with Stok Software, Inc. Your license to use Concurrent DOS also includes the right to use BackRest.

The following description of BackRest is confined to its use on a CHAIN 64 Network server. It is supplied with a predefined control file to simplify its use. This description does not attempt to tell you how to modify this control file and we suggest that you use it only in the form in which it has been supplied to you.

Warning: make sure that no network users are on-line before starting to use BackRest, and that no-one attempts to log onto the network while BackRest is running.

Floppy Disks for Backing-up Winchesters

BackRest backs-up your winchester files onto 3.5-inch floppy disks. These disks must be preformatted using the FORMAT utility supplied on the CHAIN 64 utilities disk (as FORMAT.CMD).

When you first back-up a winchester, you may need a lot of disks if the winchester is full. For example, a full 16 Mbyte winchester would need about 25 3.5-inch disks, all of which must be preformatted.

After your first back-up, the problem is not so bad. When you subsequently back-up the winchester, BackRest automatically checks each file and only backs-up those files that have been modified since the last back-up session.

Back-up Date

Make sure that the correct date is available on the server before starting to use BackRest. If the server does not have its date set, a default date will be assumed.

BackRest Components

BackRest is supplied on the CHAIN 64 Utilities disk. It consists of three files: BACK.CMD, REST.CMD, and CONTROL.BR. You will have copied these files onto drive A when you installed the Chain 64 System and Utility disks.

BACK.CMD and REST.CMD are BackRest command files. They correspond to the BACK and REST commands described in this chapter.

CONTROL.BR is BackRest's control file. It contains records that control the operation of BACK and REST. If CONTROL.BR is not on the disk in the current drive, neither BACK nor REST will perform. CONTROL.BR has already been set up for use on the CHAIN 64 server.

Backing-up a Winchester the First Time

The BACK command allows you to back-up winchester files onto 3.5-inch floppy disk. Type:

BACK<ENTER>

and watch the screen.

The drive name and user number to be backed-up will be displayed, then you will be asked to put a new, formatted disk in drive E. If you haven't got a new, formatted disk, press <ESC> and use FORMAT to prepare a disk, and type BACK<ENTER> again.

When you have a formatted disk in drive E, press <ENTER> and BACK begins reading files from winchester and writing them to the floppy disk. As each file is backed-up you will see:

`Reading` *filename ext*
`Writing` *filename ext*
`Verifying` *filename ext*

BackRest will *not* back-up files with password protection. You must release password protection on those files you want backed-up or make suitable alternative arrangements for backing-up protected files. This would ensure that protected files are not held on unprotected "public" back-up disks from which they can be copied.

When a back-up disk is full, BACK displays the disk's unique volume number so that you can stick on a label with the appropriate number.

BACK asks for more back-up disks when it requires them. When you have removed the previous disk and labelled it, put another formatted disk in drive E and press <ENTER>.

As long as you have enough floppy disks, BACK will go on until it has backed-up all winchester drives connected to the Nimbus and all user numbers. When the operation is completed, a message is displayed to inform you of this. Don't worry about any error messages that appear at this point. Control is returned to the operating system.

You can stop the BACK operation at any time by pressing <ESC>, or when prompted for a new disk. As long as you have a formatted disk ready, you can re-start and BACK will pick up where it left off.

Volume Numbers

Volume numbers are assigned sequentially to each floppy disk, beginning with the first use of BACK. Before files are copied, a volume number file is written on the back-up disk with filenames and extensions similar to the following example:

-A-00001.VOL

This shows the number (00001) for the first back-up disk containing files copied from winchester drive A. All volume number files have the VOL extension.

BackRest keeps track of your back-up disks by volume numbers, so you must label each disk. When you need to restore files (with REST), BackRest asks for each disk by the volume number.

Subsequent Backing-Up

Subsequent use of the BACK command will cause BackRest to back-up only new files or those that have been modified since the last back-up session.

BackRest uses the "Archive" bit in a files directory entry to show if a file has been changed. Each time BACK is run, it only backs up files that do not have the Archive bit set, then it sets the Archive bit.

You can selectively back-up a file by using the SET command to clear the Archive bit. For example:

```
SET FRED.DAT[ARCHIVE=OFF]<ENTER>
```

ensures that FRED.DAT is backed-up. The combination:

```
SET *.*[ARCHIVE=ON]<ENTER>
SET FRED.DAT[ARCHIVE=OFF]<ENTER>
```

ensures that FRED.DAT is the only file that is
backed up on the current drive.

The BACK FULL Command

Use this form of the BACK command to perform a
complete winchester back-up, forcing BackRest to ignore
its references to previously backed up files. BACK
FULL is equivalent to using BACK for a first back-up.

If BackRest connot locate its DIR.BR file on the
control drive, disk numbering begins again from 00001.

The BACK FULL command causes BackRest to over-
write its DIR.BR file. This means that BackRest
loses any reference to back-up operations it has performed
prior to a complete winchester back-up initiated by
BACK FULL. In all other aspects, BACK FULL
operates just like BACK.

The BACK REPORT Command

The BACK REPORT command sends a report of the
previous backup operations to your printer. See the later
section entitled "BackRest Reports".

Files Created by BackRest

As BackRest backs-up files, it creates permanent work
files on the winchester disk. All work files have a .BR
file extension. BackRest creates two kinds of work files:
a directory file and a report file.

The directory file appears on drive A of the winchester as
DIR.BR. This contains the name of each backed-up

file, the date it was backed-up, and its back-up disk
volume number. BackRest automatically copies DIR.BR
to the last floppy disk used in a backing-up session.

If DIR.BR is removed from drive A, backup disk
volume numbering begins again, starting from 00001. To
avoid volume number repetition, never erase DIR.BR
from drive A. If DIR.BR does become accidentally
erased, use the PIP command to replace it with a copy
of DIR.BR from your last back-up disk. Never use
any other copy of DIR.BR for this purpose.

The report file, REPORT.BR, records every user number
that BackRest has backed up. Printed reports indicate
files by drive, user number, and back-up disk volume
number. The RESTRPT.BR file contains information
on restore operations.

BackRest also creates files with an extension of BR@.
These files are temporary work files. Do not erase,
rename, or set any "BR" file to Read-Only and do not use
the BR extension when naming your own files.

Restoring Backed-up Files

The REST command allows you to restore files to
the winchester that were previously backed-up onto floppy
disk.

If you type:

REST<ENTER>

BackRest responds by displaying its Restore Facilities
Menu. This offers you options and prompts you for
information, allowing you to specify what files are to be
restored to the winchester:

```
Restore ...

1 — Bad files automatically
2 — Other file(s) to original drive
3 — Other file(s) to alternate drive

[RETURN KEY] — End

Enter option ==>
```

If you have been unfortunate enough to lose all the files on your winchester, you would choose option 2 to restore the back-up files from floppy disk.

Taking this situation as the example case, here is what you do in response to the displayed prompts:

- press 2

- press <ENTER> to restore all winchester drives

- press <ENTER> to restore all user numbers

- press <ENTER> in response to the request for a path

- press *.* to restore all files

- enter the current date (American format) and press <ENTER>

- insert disk 1 in drive E and press <ENTER>. Insert subsequent disks in drive E when prompted.

The files are automatically restored. As each file is restored, you will see:

```
Reading  filename
Writing  filename
Verifying  filename
```

After each disk has been restored, you are prompted to enter the next disk – identified by volume number.

If you insert the wrong backup disk in response to this prompt, REST displays:

```
Wrong volume . . .
```

and requests the correct volume number again.

When the restoring process is finished, you are returned to the Restore Facilities Menu.

Selective Restoring

The REST command gives you flexibility over what files you restore. By making selections at the screen prompts you can control:

- which winchester partition (A,B,C,D,I,J,K or L) will be restored

- which user number (0 to 15)

- which file(s). You can enter the name of a single file or you can use wildcard characters (? and *) to specify a group of files

- which version of a file according to the date of back-up. If you press <ENTER> when prompted for the date, the most recently backed-up copies are used. Consequently, you must maintain an accurate date on the server for accurate and effective file back-ups.

If REST cannot locate any files that correspond to your specifications, it displays the following message and returns you to the Restore Facility Menu.

```
Your request did not match any files backed up
```

If you use option 3 of the Restore Facility Menu, you can restore files to an alternate drive. The prompts are the same as for option 2 except thaty you are asked to enter the original winchester drive and the alternate one that you choose as the restore drive.

If you select option 1, REST reads the REPORT.BR file created by BACK to determine which files were unusable at the time of the last back-up. REST identifies the disk volume number for the most recently backed-up version of the file known to be usable, it prompts you to insert this disk in drive E.

If BACK did not encounter any "bad" files during the last back-up operation, REST displays the following message in response to your selection of option 1:

```
There are no bad files to restore
```

The REST REPORT Command

Use the REST REPORT command to print a report of the previous restore operation by typing:

```
REST REPORT<ENTER>
```

BackRest displays the following message before sending the report to your printer:

```
Printing report, please standby . . .
```

When the report has been printed, REST displays:

```
End of BackRest processing
```

and returns control to the operating system. If you have not previously run REST, the report consists of only one line:

```
File RESTRPT.BR cannot be found
```

Cancelling a REST Operation

If you want to end a restore operation before it has
finished, press <CTRL/C>. You will see the
message:

```
User abort of Restore process
```

and control will be returned to the operating system.

BackRest Reports

BackRest sends its reports to your printer when its backup
and restore operations are completed. BackRest reports
provide you with a permanent reference of previous backup
and restore operations, winchester statistics, and any
errors the program encountered during its processing.

Back-up Report

On CHAIN 64, back-up reports are made up of
three sections:

- files backed-up

- files skipped

- bad files

BackRest prints a heading on each page of the report.
This heading is the contents of the drive identity field.

The files backed-up section lists all files that were
copied during the previous back-up session, according to
source drive, floppy disk volume number, and user number.

Also, BackRest uses the letters K or S after each
filename. The K indicates that the source file was kept
on the source drive after BackRest copied it to a floppy

disk. The S indicates a split file. BackRest splits any single files that are too large to fit on one blank back-up disk.

An example of this section of a back-up report is shown below:

```
BackRest 2.1 Report for Back-up of CHAIN 64
winchester done on mm/dd/yy.

Files Backed Up

Drive A User 0 Backup Volume 00003

CONSOLE.BAS K DELTA .BAT K DISPLAY .CMD K
DONE .BAT K

Drive B User 1 Backup Volume 00003

AUDIT .DAT K BATCH .CMD K CCPM .SYS S
```

The files skipped section of the report lists all the files that were not backed-up. Normally, these are files with BAK or $$$ extensions.

The last section of the report lists all the files that BackRest could not read during a back-up session. See the REST command (option 1) for information on restoring "bad files".

Restore Report

BackRest prints a report of the files it has restored as part of REST processing. An example restore report is shown below.

```
BackRest 2.1 Report for Backup of CHAIN-64
winchester done on mm/dd/yy

Files Restored

Drive C User 0 Backup Volume 00001

CTYPE .H CURRENT .TXT SAMPLE .C
```

Winchester Statistics Report

This report shows the amount of disk space and the number of files in each user number. The report also shows the number of files in each user number. The report also shows the number of backed-up files on a disk, the amount of available winchester disk space, and the total number of directory areas used for files.

For example:

```
BackRest 2.1 Report for Backup of CHAIN 64
winchester done on mm/dd/yy

Statistics Report

Date of last backup: mm/dd/yy

Drive D: User 0: 1043K in 102 files.
4 files backed up
Drive D: User 1: 159K in 8 files.
4 files backed up

Drive D: Total of 8 files backed up out of 110.
Drive D: 3293K available.
324 directory areas used.
```

Error Report

This report lists any errors BackRest encountered during backup and restore operations. For example:

```
BackRest 2.1 Report for Backup of CHAIN 64
winchester done on mm/dd/yy
```

```
Error Report
```

```
Unresolved Error Source APRIL.AP on Drive D:
User 0, backup retried on new disk.
```

```
1 wrong volumes inserted by operator.
```

This shows that BACK encountered an error it could not resolve while backing up the file APRIL.AP from user number 0, drive D. The error message indicates that BACK copied the file to another backup disk. The second error occurred when the user inserted the incorrect backup disk during a restore operation. In this case, REST would have prompted the user for the proper disk.

Here are two other example error messages:

```
Destination Backup Drive X: has a Sector
Error backup retried on new disk.
```

A media error occurred while BackRest was writing a backup file. BackRest attempted another copy on a different backup disk.

```
Source Disk Sector Error in File xxxxxxxx.xxx
on Drive X: skipped file.
```

A media error occurred while BackRest was reading a source file. The file was not copied to a backup disk.

Summary of BackRest Functions

BackRest is supplied pre-configured to carry out the functions summarized in this section.

The backing-up functions are:

- it will search for and read drives A,B,C,D,I,J,K and L (the eight winchester partitions allowed on a CHAIN 64 server), and it will back-up files that do not have the Archive bit set.

- it will write back-up copies of files on formatted floppy disks in drive E (lefthand 3.5-inch Nimbus disk drive)

- it will search for files belonging to all the user numbers permitted (0 – 15)

- it will look for its control file (CONTROL.BR) and directory file (DIR.BR) on drive A

- it will split a file accross two floppy disks if necessary

- it will not re-use a floppy disk already containing back-up files. It will not erase any files that exist on a floppy disk and it will not overwrite any file with the same name that is already on the disk

- it will not write-verify the files as it copies them

The restoring functions are:

- it will restore all files or those associated with: a winchester partition; a user number; a single, named file; a generic (wildcard) name; the date of back-up

- it will not overwrite password-protected files

The reporting functions are:

- it will produce a series of reports only when requested with BACK REPORT or REST REPORT. The reports will be 80 characters wide with 60 lines per page

- a back-up report will contain the names of the files backed-up on each floppy disk (volume number), grouped by winchester drive name and user number. It will also contain the names of any files that were not backed-up

- a back-up report can contain warning and error messages

- a back-up report will contain a statistical report giving details of the number of files backed-up, and the space used, and the space remaining on each winchester drive

- a restore report will contain the names of the restored files, the volume number of the floppy disk from which they were restored, and the winchester drive name and user number to which they were restored.

Appendix
Error Messages

This appendix (extracted from the Digital Research
"Concurrent DOS 4.1 Users Guide") lists Concurrent
DOS 4.1 error messages that may appear when you are
using that operating system on the Nimbus. Note that
these are not network errors. Network errors only appear
at network stations – see the User's Guide.

There are two amendments to the text:

- for "in section 7" read "in chapter 4 of this module"

- for "HDMAINT" read "HARDDISK"

Starting on the second page of this appendix is a quick
reference listing of Concurrent error messages in
alphabetical order, with explanations and suggestions for
correcting error conditions.

Sources of Error Messages

Error messages come from several different sources:

- Each command supplied with Concurrent has its own set
  of error messages.
- Concurrent displays messages when error conditions
  occur during execution of file system operations.
  These messages include those originating in the Basic
  Disk Operating System (BDOS) and the Terminal
  Message Processor (TMP).
- Concurrent's Extended Input/Output System (XIOS)
  displays messages when certain hardware-related error
  conditions occur.

Hard Disk Caution

Reformatting a partition of a hard disk is mentioned as a corrective action for several hard-disk error conditions mentioned in this appendix. If possible, back up all of the files within the partition before reformatting.

If recreating a partition fails to correct the error condition, you have a hardware problem. Consult the dealer from whom you bought your personal computer.

Performing a System Reset

Error conditions that require you to perform a system reset, by pressing Ctrl-Alt-Del, are extremely rare. If such a condition occurs, make every attempt to exit a program normally, or as a second choice, use the STOP command, before resetting your system. If you have no alternative but to reset your system, try to close any open files before doing so.

```
The following is a list of error messages in alphabetical order.

When absolutely nothing happens:

First, wait.  Some programs take a long time to finish.  Some
errors, such as Disk I/O errors, cause Concurrent to retry the
operation many times.  With a little experience, you will know when
a command is taking too long.

Backup and hard disk media types differ, can't restore

BackRest (REST) error.  You have changed your hard-disk partition
from one format to another, PC DOS to CP/M, or vice-versa, since the
time of the last backup.  BackRest can restore files only to a hard
disk having the same format from which the files were backed up.


Bad Sector on Disk

FUNCTION error.  Message indicates a defective disk.  Use a
different disk.
```

*** Cannot find CPM.SYS or CCPM.SYS ***
        Try another diskette

Disk loader error. The disk loader could not locate an operating system file to read in. Try restarting the operating system from a different copy of the Concurrent Startup disk.

Cannot properly initialize the disk you inserted,
Please remove it and insert a new CP/M Media disk.
Touch RETURN key when ready =='

BackRest (BACK) error. Message indicates an unformatted or defective disk, or a disk with a covered write-protect notch. See "Disk Handling" at the end of this appendix. If you are using a DOS diskette, "CP/M" is replaced by "DOS" in this message.

Can't find CCPM.SYS

SETUP error. This message indicates that CCPM.SYS is not on the current or specified drive.

Can't find file: CPM.SYS / CCPM.SYS

Concurrent hard-disk system loader error. CCPM.SYS is the file containing the Concurrent operating system. CPM.SYS is the file containing the CP/M-86 operating system. The file or files are not copied to the CP/M partition, or the filename is spelled incorrectly. You must restart Concurrent from the Startup disk to continue operation. Use PIP or COPY to copy CCPM.SYS or CPM.SYS to the CP/M partition.

CAN'T LOAD CCPM.SYS - Input/output devices are now in use by
                      a MODE, ramdisk, or spooler command.

Try making "LOADCCPM ask" the FIRST command in your AUTOEXEC.BAT file.

LOADCCPM error. LOADCCPM cannot load Concurrent after other input/output device redirection commands have been executed. Use LOADCCPM to load the system before you enter any device commands.

Can't read CCPM.SYS

SETUP error. Message indicates a defective disk or defective hardware. See "Error Handling Procedures" at the end of this appendix.

Can't read from Boot disk!

Concurrent hard disk system loader error. The system loader is unable to read the operating system files on the PC DOS partition because of defective blocks. You must restart Concurrent to continue operation. This message might indicate hardware failure. Any attempts to access the PC DOS partition might produce unpredictable results. You may be able to recreate the PC DOS partition on the hard disk with HDMAINT. Remember that any attempt to create a new partition requires that you delete the existing partition.

Can't write to CCPM.SYS

SETUP error. Message indicates a defective disk or defective hardware. See "Error Handling Procedures" at the end of this appendix.

Concurrent Error: Bad Sector

REN, SET error. This error message indicates a hardware error. Refer to the "Error Handling Procedures" at the end of this appendix for a discussion of possible hardware errors.

Concurrent Error: Bad File Spec
Concurrent Error: Bad Disk Drive\Filename\File Ext.\Password

TMP error. One or more elements of a file specification you entered are invalid.

Concurrent Error: Can't Find BATCH.CMD

TMP error. Concurrent cannot execute the commands contained in your batch file because it cannot locate the file BATCH.CMD. Store BATCH.CMD in your system drive (in User 0 if your system drive is a CP/M medium) and give it the SYS attribute so that you can use batch files from any directory in your system.

Concurrent Error: Can't Find Command

TMP error. Concurrent cannot find your command file. You might have mistyped the command. If not, the command file is not in the current directory or the root directory of the system drive. If the command file is stored in the system drive (in User 0 on CP/M media), it may not have the SYS attribute. See "System Drive Assignment" in Section 1 for a description of how Concurrent searches for commands.

Concurrent Error: CLI Abort

TMP error. The Command Line Interpreter (CLI) was stopped, typically by a Ctrl-C. If you did not intend to terminate the command, you must reenter the command line.

Concurrent Error: File not found

TMP error. Concurrent cannot locate the file specified in the command line. Check the spelling of the filespec. If your spelling was correct, use DIR to check the contents of other directories.

Concurrent Error: Invalid Drive Specification

TMP error. The drive selected is not part of your system. Concurrent supports up to eight drives, lettered A through H, plus drive M (MDISK), and the floating drives, N and O.

Concurrent Error: Load Error

TMP error. This message indicates a corrupted command file or an error of unknown origin. Refer to "Corrupted Files" in this appendix for a discussion of recovery procedures for corrupted command files. If this message recurs, replace the program file on disk with your backup copy. If you still receive the message, contact your technical support group for your personal computer for help in locating the cause of the error, or consult the vendor from whom you purchased your system.

Concurrent Error: Not Enough Memory

TMP error. There is not enough memory available to load the command file you specified. This error can also occur when the command file is corrupted.

Concurrent Error: PD Table Full

TMP error. You have reached the maximum number of processes possible with your personal computer. Wait until one or more programs are finished, or use STOP or Ctrl-C to terminate one or more programs. This error might affect more than just the program that received the error message.

Concurrent Error: Read Error

TMP error. This error message indicates a hardware error.

Concurrent Error on d: Close Checksum Error

BDOS error. A file cannot be closed properly because the directory Concurrent finds on the disk does not match the one logged into memory. This error usually occurs when the disk has not been reset. Ensure that no other processes are running and restart the system. If the error recurs, it might mean that the application you are running is incompatible with Concurrent.

Concurrent Error on d: Disk I/O

BDOS error. This error message indicates a hardware error.

Concurrent Error on d: Disk reset denied

BDOS error. A program tries to reset a drive with an open file. Locate the program with the open file and either wait for it to finish or terminate the program with a Ctrl-C or the STOP command.

Concurrent Error on d: File Already Exists

BDOS error. You tried to create or rename a file when there is already a file of that filename and file extension in the current or specified directory.

Concurrent Error on d: File Currently Open

BDOS error. A program tried to delete, rename, or modify an
attribute of a file currently opened by another program. Either
wait until the other program is finished and the file is closed, or
use the STOP command or Ctrl-C to stop the program. This error also
occurs when a program tries to open a file that is already open and
the new open mode is incompatible with the mode in which the file
was opened previously.

Concurrent Error on d: File Opened in Read/Only Mode

BDOS error. A program attempted to write to a file opened in
Read/Only mode. A file is opened in Read/Only mode if it resides in
User 0 and is opened by another program from another user number.
Locate the other program and either wait for it to finish, or
terminate it with a Ctrl-C.

Concurrent Error on d: Illegal ? in FCB

BDOS error. You used a wildcard character, ? or *, where wildcard
filespecs are not permitted.

Concurrent Error on d: Invalid Drive

BDOS error. The drive selected is not part of your system.
Concurrent supports up to eight drives, A through H, plus drive M
(MDISK), and the floating drives, N and O.

Concurrent Error on d: No Room in System Lock List

BDOS error. The Open File, Make File, and Access Drive functions
return this error when no room for new entries exists within the
system lock list.

Concurrent Error on d: Open File Limit Exceeded

BDOS error. A program has tried to open one or more files than the
maximum number of open files per process that the system can
accommodate.

Concurrent Error on d: Password Error

BDOS error. A password is incorrect or missing. Avoid this error
with password-protected drives and files by setting a default
password. See SET in Section 7 for an explanation of default
passwords.

Concurrent Error on d: Read/Only File

BDOS error. A program tried to write to a file when that file was
set to Read/Only. Use the SET command, SET d:filespec [RW>, to set
the file to Read/Write, then reenter the command line.

Concurrent Error on d: Read/Only Disk

BDOS error. A program tried to write to a file when the drive was
set to Read/Only. Use the SET command, SET d:[RW], to set the drive
to Read/Write, then reenter the command line.

Could not protect or reset drive.

SET error. This error message indicates a hardware error.

Concurrent is already loaded

LOADCCPM error. Concurrent is already loaded into memory and operating from the partition specified. LOADCCPM cannot load Concurrent a second time. No action is necessary.

Defective hard disk CP/M partition

Concurrent hard-disk system loader error. The system loader is unable to read CP/M partition information in the Partition Table. You must restart Concurrent from the Startup disk to continue operation. Use HDMAINT to recreate the CP/M partition on the hard disk.

Destination Backup Drive d: has a Read-Only file,
Please remove it and insert a new CP/M Media disk.
Touch RETURN key when ready ==>

BackRest (BACK) error. A file in the specified drive is set to RO. Use SET to set the file to Read/Write. Also, check the disk's write-protect notch. If you are using a PC DOS disk, "CP/M" is replaced by "DOS" in this message.

Destination Backup Drive d: has a Sector error,
Please remove it and insert a new CP/M Media disk.
Touch RETURN key when ready ==>

BackRest (BACK) error. Message indicates a bad sector on your disk. If you are using a PC DOS disk, "CP/M" is replaced by "DOS" in this message.

DESTINATION IS R/O, DELETE (Y/N)?

PIP error. The destination file specified in a PIP command already exists and it is Read/Only. If you type Y (for Yes), the existing file is deleted and replaced with the file specified in the PIP command. If you do not want to delete the existing file, type N (for No). You can use the W option to avoid this message. Refer to PIP in Section 7, for a discussion of PIP options.

Directory needs to be reformatted for time/date stamps.

SET error. You attempted to set time/date stamps on an uninitialized directory. Refer to INITDIR in Section 7 for instructions on initializing a directory for time stamping.

Disk Error   Drive d: Track 00   message   Retry,Ignore,Accept?

This error originates in the XIOS. The XIOS is that portion of the operating system that handles input and output to and from disk drives and other peripheral devices. In the disk error message, d: stands for the drive letter and "message" stands for a specific message that indicates the nature of the error condition.

In general, a disk error message indicates that Concurrent was unable to read from or write to a hard disk or disk in the specified drive.   The various messages that can appear in the "message" portion of a disk error message are described at the end of this appendix, in "Disk Error Messages."

When you press R, I, or A for Retry, Ignore, or Accept, you get the following results:

The Retry option gives you the opportunity to correct an error condition. For example, if you invoke a DIR E: command and the A drive door is open, you receive a status line error message similar to the one above. After receiving the message you can close the drive door and press R for Retry.   Your command then executes correctly.

The Ignore option returns you to the operating system level. Concurrent operation resumes just after the point where it encountered the error condition.   If the error condition still exists, the error message can appear again.

The Accept option returns you to the operating system level. Concurrent gives you a message in the format: "Concurrent Error: message," where "message" is a description of the error condition. The various Concurrent errors are listed in this appendix.

Disk I/O Error

ERASE, ERAQ error. This error message indicates a hardware error.

Disk error in reading CCPM.SYS (or CPM.SYS)

Concurrent hard-disk system loader error. CCPM.SYS is the file containing the Concurrent operating system. CPM.SYS is the file containing the CP/M-86 operating system. The system loader is unable to read those files on the CP/M partition because of defective blocks. You must restart Concurrent from the Startup disk to continue operation. This message might indicate hardware failure. Any attempts to access the CP/M partition can produce unpredictable results. You might be able to recreate the CP/M partition on the hard disk with HDMAINT.

Disk error reading system loader

Concurrent hard-disk system loader error. The system loader is unable to read the operating system files on the CP/M partition because of defective blocks. You must restart Concurrent to continue operation. This message might indicate hardware failure. Any attempts to access the CP/M partition might produce unpredictable results. You might be able to recreate the CP/M partition on the hard disk with HDMAINT. If this error occurs after a partition containing files already exists, remember that any attempt to create a new partition requires that you delete the existing partition. The process destroys all files in the partition.

Disk Full

FUNCTION error. Indicates that you must erase files from your destination disk or use a different disk.

Disk Not Ready

BackRest error. A disk is improperly inserted or a drive door was left open.

Divide interrupt from processname at address
Press any key to stop process

XIOS error. "processname" stands for the process running at the time the error condition is encountered. "address" stands for memory address. A program performs an illegal divide operation, such as a divide-by-zero operation.

Drive Read Only

REN error. You attempted to rename a file on a drive that is set to Read/Only. If you want to rename the file, use the SET command to set the drive to Read/Write. Use the SET [HELP] command for more information.

8087 not installed

8087 error. This message is returned when you enter an 8087=ON command when you do not have a properly installed 8087 chip.

Enable password protection first:SET d:[protect=on]

SET error. You attempted to set a password or protection on a file without first enabling protection for the disk or hard disk. Refer to SET in Section 7 for a discussion of password protection.

Entry number too large

STOP error. The entry number for the program you want to terminate does not exist. Use entry numbers that are displayed in STOP's menu.

ERROR: BAD PARAMETER

PIP error. The command line contains an illegal parameter. Refer
to Section 7 for an explanation and listing of the PIP command
parameters.

ERROR: CAN'T DELETE TEMP FILE - d:filespec

PIP error. This message indicates a possible damaged disk.

ERROR: CAN'T DELETE TEMP FILE INCOMPATIBLE MODE - d:filespec

PIP error. A temporary file, with the file extension $$$, exists
and cannot be deleted because it is currently opened by another
program. Check your windows until you locate the program that has
the file open and wait for it to finish or terminate it.

ERROR: CAN'T DELETE TEMP FILE INVALID PASSWORD - d:filespec

PIP error. You attempted to delete a password protected temporary
file without providing the correct password. Type the correct
password with the file specification, d:filename;password, and
reenter the PIP command line.

ERROR: CAN'T DELETE TEMP FILE NONRECOVERABLE - d:filespec

PIP error. This error message indicates a hardware error.

ERROR: CAN'T DELETE TEMP FILE R/O DISK - d:filespec

PIP error. A temporary file, with the file extension .$$$, exists
and cannot be deleted because the drive is set to Read/Only. Use
the SET command, SET d:[RW], to set the drive to Read/Write.

ERROR: CAN'T DELETE TEMP FILE R/O FILE - d:filespec

PIP error. A temporary file, with the file extension .$$$, exists
and cannot be deleted because it is set to Read/Only. Use the SET
command, SET d:filespec [RW], to set the file to Read/Write, then
reenter the PIP command.

ERROR: CLOSE FILE - d:filespec

PIP error. This message indicates a possible damaged disk.

ERROR: CLOSE FILE FCB CHECKSUM - d:filespec

PIP error. This message indicates a possible problem with your
media or hardware. Check your disk and connections to your computer
and hard disk.

ERROR: CLOSE FILE INVALID DISK SELECT - d:filespec

PIP error. The drive selected is not part of your system.
Concurrent supports up to eight drives, A through H, plus drive M
(MDISK), and the floating drives N and O.

ERROR: CLOSE FILE NONRECOVERABLE - d:filespec

PIP error. This error message indicates a hardware error.

ERROR: CLOSE FILE R/O DISK - d:filespec

PIP error. PIP cannot write the file indicated to the drive because the drive is set to Read/Only. Use the SET command, SET d:[RW], to set the drive to Read/Write, then reenter the PIP command.

ERROR - Currently Opened

SET error. You attempted to use SET with a file that is currently open. Locate the program that has the file open and either wait for it to finish or terminate it.

ERROR: DISK READ - d:filespec

PIP error. This message indicates a possible damaged disk.

ERROR: DISK READ CAN'T CLOSE CURRENT EXTENT - d:filespec

PIP error. This message indicates a possible problem with your media or hardware. Check your disks and connections to your computer and hard disk.

ERROR: DISK READ FCB CHECKSUM - d:filespec

PIP error. This message indicates a possible problem with your media or hardware. Check your disks and connections to your computer and hard disk.

ERROR: DISK READ INVALID DISK SELECT - d:filespec

PIP error. The drive selected is not part of your system. Concurrent supports up to eight drives, A through H, plus drive M (MDISK), and the floating drives N and O.

ERROR: DISK READ INVALID FILENAME - d:filespec

PIP error. The filename specified is too long, or a delimiter was used as the first character. Filenames cannot be longer than eight characters. Correct the filename and reenter the command line.

ERROR: DISK READ NONRECOVERABLE - d:filespec

PIP error. This error message indicates a hardware error.

ERROR: DISK READ RANDOM RECORD OUT OF RANGE - d:filespec

PIP error. This message indicates a possible problem with your media or hardware. Check your disks and connections to your computer and hard disk.

ERROR: DISK READ SEEK TO UNWRITTEN EXTENT - d:filespec

PIP error. This message indicates a possible problem with your media or hardware. Check your disks and connections to your computer and hard disk.

ERROR: DISK WRITE - d:filespec

PIP error.   This message indicates a possible damaged disk.

ERROR: DISK WRITE CAN'T CLOSE CURRENT EXTENT - d:filespec

PIP error.   This message indicates a possible problem with your media or hardware.   Check your disks and connections to your computer and hard disk.

ERROR: DISK WRITE FCB CHECKSUM - d:filespec

PIP error.   This message indicates a possible problem with your media or hardware.   Check your disks and connections to your computer and hard disk.

ERROR: DISK WRITE INVALID DISK SELECT - d:filespec

PIP error.   The drive selected is not part of your system. Concurrent supports up to eight drives, A through H, plus drive M (MDISK), and the floating drives N and O.

ERROR: DISK WRITE NO DATA BLOCK - d:filespec

PIP error.   The disk or hard disk to which PIP is writing is full. The file indicated by filespec was not copied.   Specify a different destination drive or use the ERASE command to erase any unnecessary files from the full disk.   If the destination medium is a disk, you can replace the full disk before you reenter the PIP command.

ERROR: DISK WRITE NO DIRECTORY SPACE - d:filespec

PIP error.   The disk or hard disk to which PIP is writing has no directory space available.   Specify a different destination drive or use the ERASE command to erase any unnecessary files from the full directory.   If the destination medium is a disk, you can replace the disk before you reenter the PIP command line.

ERROR: DISK WRITE NONRECOVERABLE - d:filespec

PIP error.   This error message indicates a hardware error.

ERROR: DISK WRITE R/O DISK - d:filespec

PIP error.   The destination drive is set to Read/Only.   Use the SET command, SET d:[RW], to set the drive to Read/Write, then reenter the PIP command.

ERROR: DISK WRITE R/O FILE - d:filespec

PIP error.   The destination file is set to Read/Only.   Use the SET command, SET d:filespec [RW], to set the file to Read/Write, then reenter the PIP command.

ERROR: DISK WRITE RANDOM RECORD OUT OF RANGE - d:filespec

PIP error.   This message indicates a possible problem with your media or hardware.   Check your disks and connections to your computer and hard disk.

ERROR: DISK WRITE RECORD LOCKED - d:filespec

PIP error. This message indicates a possible problem with your media or hardware. Check your disks and connections to your computer and hard disk.

ERROR: FILE NOT FOUND - d:filespec

PIP error. The input file indicated by filespec does not exist in the current or specified directory. Ensure that you are typing the correct filename, drive specifier, and user number. Use DIR to check other directories for the location of the source file. This error can also occur when the file you are trying to copy with PIP has a system attribute. Use the R option with PIP to copy the file. Refer to PIP in Section 7 for more information.

ERROR: FILE NOT FOUND INVALID DISK SELECT - d:filespec

PIP error. The drive selected is not part of your system. Concurrent supports up to eight drives, A through H, plus drive M (MDISK), and the floating drives N and O.

ERROR: FILE NOT FOUND NONRECOVERABLE - d:filespec

PIP error. This error message indicates a hardware error.

ERROR: First SET B:[protect=on]

SET error. You tried to set or change a password before enabling password protection on the drive. SET d:[protect=on] enables password protection on the drive and allows you to set and change passwords on the files on that disk. If the drive label itself has a password, you must provide the password to change protection. Refer to SET in Section 7 for an explanation of password protection.

Error found on disk.
Please remove it and insert a new CP/M Media disk.
Touch RETURN key when ready ==>

BackRest (BACK) error. Message indicates a defective disk. If you are using a PC DOS disk, "CP/M" is replaced by "DOS" in this message.

ERROR: HEX RECORD CHECKSUM - d:filespec

PIP error. A Hex record checksum error was encountered during the transfer of a Hex file. This message indicates a corrupted or truncated Hex file. Use the PIP command to copy the Hex file from your backup disks. If you do not have a backup, you must erase the damaged file and recreate it.

ERROR: Illegal command tail

SDIR error. SDIR does not recognize what you entered after the command. Enter HELP SDIR or see SDIR in Section 7 for the correct syntax.

ERROR: Illegal option or modifier

SDIR error. The option or modifier you supplied is not valid with
SDIR. Enter HELP SDIR or see SDIR in Section 7 for a listing of the
SDIR options and modifiers.

ERROR: Invalid Command Option

SDIR error. The option or modifier you supplied is not valid with
SDIR. Enter HELP SDIR or see SDIR in Section 7 for a listing of the
SDIR options and modifiers.

ERROR: INVALID DESTINATION - d:filespec

PIP error. The destination specified in your PIP command is
illegal. You have specified an input device as a destination, or
used a wildcard file specification. Refer to PIP in Section 7 for a
discussion of the valid PIP destinations.

ERROR: INVALID FORMAT

PIP error. The format of your PIP command is incorrect. Refer to
the PIP command for the correct syntax.

ERROR: INVALID FORMAT WITH SPARSE FILE - d:filespec

PIP error. This error usually occurs when you use PIP to
concatenate or otherwise to change the format of a sparse file.
Refer to the Concurrent Programmer's Reference Guide, available from
Digital Research®, for more information on sparse files and their
requirements.

ERROR: INVALID HEX DIGIT - d:filespec

PIP error. An invalid Hex digit is encountered while reading a Hex
file. This message indicates a truncated or corrupted Hex file.
Use PIP or COPY to copy the file from your backup disk. If you do
not have a backup, you must erase the damaged file and recreate it.

ERROR: INVALID SEPARATOR

PIP error. In a PIP command line, a comma is the only valid
separator between input filenames.

ERROR: INVALID SOURCE

PIP error. The source specified in your PIP command is illegal.
You have specified an output device as a source or used a wildcard
filespec. Refer to PIP in Section 7 for a discussion of the legal
sources for a PIP command.

ERROR: INVALID USER NUMBER

PIP error. You have specified a user number greater than 15 or less
than 0. Valid user numbers are from 0 to 15.

Error loading operating system

Concurrent hard-disk system loader error. Unable to read operating system loader file. You must restart Concurrent from the Startup disk to continue operation of your personal computer. This message originates in software that IBM supplies with the hard disk. Use HDMAINT to write the system loader on the partition where the error occurred. If this does not correct the error condition, you have a hardware problem.

ERROR: MAKE FILE - d:filespec

PIP error. This message indicates a possible damaged disk.

ERROR: MAKE FILE ALREADY EXISTS - d:filespec

PIP error. This message indicates a possible problem with your media or hardware. Check your disks and connections to your computer and hard disk.

ERROR: MAKE FILE INVALID DISK SELECT - d:filespec

PIP error. The drive selected is not part of your system. Concurrent supports up to eight drives, A through H, plus drive M (MDISK), and the floating drives N and O.

ERROR: MAKE FILE INVALID FILENAME - d:filespec

PIP error. The filename specified is too long, or you used a delimiter as the first character. Filenames cannot be longer than eight characters.

ERROR: MAKE FILE LIMIT EXCEEDED - d:filespec

PIP error. There are too many files open for the Concurrent open file list. Check your other windows for programs with open files and either wait until they finish or terminate one or more programs.

ERROR: MAKE FILE NONRECOVERABLE - d:filespec

PIP error. This error message indicates a hardware error.

ERROR: MAKE FILE R/O DISK - d:filespec

PIP error. PIP cannot create the file indicated because the drive is set to Read/Only. Use the SET command, SET d:[RW], to set the drive to Read/Write, then reenter the PIP command.

ERROR: NO DIRECTORY SPACE - d:filespec

PIP error. The disk or hard disk to which PIP is writing has no directory space available. Specify a different destination drive or use the ERASE command to erase any unnecessary files from the full disk. If the destination medium is a disk, you can replace the full disk before you reenter the PIP command line.

ERROR: No HELP.HLP file on the current drive

HELP error. The HELP.HLP file must be on the current drive in order to access it.

ERROR: OPEN FILE - d:filespec

PIP error. This message indicates a possible damaged disk.

ERROR: OPEN FILE INCOMPATIBLE MODE - d:filespec

PIP error. Some other program has the file indicated by d:filespec opened. Check your other windows to locate the program and either wait until it has finished or terminate it.

ERROR: OPEN FILE INVALID DISK SELECT - d:filespec

PIP error. The drive selected is not part of your system. Concurrent supports up to eight drives, A through H, plus drive M (MDISK), and the floating drives N and O.

ERROR: OPEN FILE INVALID FILENAME - d:filespec

PIP error. This message indicates a possible problem with your media or hardware. Check your disks and connections to your computer and hard disk.

ERROR: OPEN FILE INVALID PASSWORD - d:filespec

PIP error. You tried to copy a password-protected file without entering the password. Include the password in the file specification and reenter the command line.

ERROR: OPEN FILE LIMIT EXCEEDED - d:filespec

PIP error. There are too many files open in the Concurrent open file list. Check your other windows for programs with open files and either wait until they finish or terminate one or more programs.

ERROR: OPEN FILE NONRECOVERABLE - d:filespec

PIP error. This error message indicates a hardware error.

ERROR: Parameter Required, try SET [HELP]

SET error. This message indicates a syntax error in the SET command line. Enter a SET [HELP] command for examples of correct SET syntax.

ERROR: PRINTER BUSY

PIP error. This message indicates that the printer is in use by
another program. Wait until it is available or locate the program
using the printer   and terminate it.
Some programs do not release the printer after the print job is
complete. You must terminate such a program to make the printer
available to programs.

ERROR: QUIT NOT FOUND

PIP error. The string argument to a Q parameter is not found in
your input file. Ensure that you typed the correct string and retry
the operation. This error can also occur when entering the Q option
from the command line. Concurrent translates everything in the
command line into uppercase. To avoid this problem, invoke PIP
without a command tail and wait for the * prompt before entering the
file specifications and Q option.

Error reading control file.

BackRest (BACK) error. CONTROL.BR might be stored on a defective
area of your hard disk. Use a backup copy of CONTROL.BR, or
recreate it according to the guidelines in BACKREST.DOC.

ERROR: RECORD TOO LONG

PIP error. A Hex record exceeds 80 characters in a file being
copied with the [H] or [I] option.

ERROR: Some other process has an open file.

INITDIR error. INITDIR cannot be run when any program on any drive
is accessing a file. Find the drive with the open file and either
wait until the program is finished or terminate it.

ERROR: START NOT FOUND

PIP error. The string argument to an S parameter could not be found
in the source file. Ensure that you are typing the correct string
and retry the operation. This error can also occur when entering
the S option from the command line. Concurrent translates
everything in the command line into uppercase. To avoid this
problem, invoke PIP without a command tail and wait for the * prompt
before you type the file specifications and S option string.

ERROR: Too many entries in Index Table.
       Not enough memory

HELP error. There is not enough memory available to hold the topic
table while creating HELP.HLP. If you are running one or more large
programs in other windows, wait until they are finished before
reentering the HELP [Create] command line.

ERROR: Unable to close HELP.DAT
         Unable to close HELP.HLP

HELP error. The disk to which the file is being written is either
full or has no directory space available. Use PIP or COPY to copy
HELP.DAT or HELP.HLP to a disk that has sufficient free space, then
reenter the HELP[E] or HELP[C] command. After creating a new
HELP.HLP, give the file the SYS attribute and store it in the system
drive so that you can obtain help from any directory in your system.

ERROR: Unable to Make HELP.DAT
         Unable to Make HELP.HLP

HELP error. There is not enough space on the disk for HELP.HLP or
HELP.DAT, or the files are Read/Only. If the files are Read/Only,
use the SET command to set them to Read/Write. After creating a new
HELP.HLP, give the file the SYS attribute and store it in the system
drive so that you can obtain help from any directory in your system.

ERROR: UNEXPECTED END OF HEX FILE - {filespec}

PIP error. The last Hex record was not as long as the character
count indicated. The Hex file is truncated. Use PIP to write a
copy of the truncated file from your backup disk. If you do not
have a backup, you must erase the damaged file and recreate it.

ERROR: USER ABORTED

PIP error. You terminated a PIP operation by entering a Ctrl-C or
by pressing a key. If you did not intend to terminate the
operation, you must reenter the PIP command line.

ERROR: VERIFY - d:filespec

PIP error. When copying with the V option, PIP found a difference
between the data just written and the data in its memory buffer.
Usually, this message indicates a hardware error. Refer to the

*** Error while reading System File ***
         Try another diskette.

Disk loader error. The disk loader found the operating system file
CCPM.SYS, but it could not read the file into memory correctly. Try
restarting from a different copy of your Concurrent Startup disk.

ERROR: Writing file HELP.DAT

HELP error. Following a HELP[E] command, this message usually means
that the destination disk is full. Erase any unnecessary files or
copy the HELP.HLP file to a different disk and retry the operation.

ERROR: Writing file HELP.HLP

HELP error. Following a HELP[C] command, this message usually means
that the destination disk is full. Erase any unnecessary files or
copy the HELP.HLP file to a different disk and retry the operation.

ERROR: Wrong Password

SET error. You tried to use SET with a file or drive that is password protected. The first time this message appears, a prompt for the password appears under it. Enter the password. If it is incorrect, this message appears a second time and SET returns you to the command line prompt.

Fatal Control File (CONTROL.BR) Error:
        message

BackRest (BACK) error. A "fatal" error condition causes you to return to the operating system level where you must correct the error condition before resuming use of BackRest. The message field, above, is filled with one of the following:

- Badly formed file name
- Control File not found
- Delete flag should be "T" or "F"
- Drive differs from previous "PATH:"
- Duplicate record
- Function should be "C", "N", or "A"
- Illegal disk drive specified
- Incomplete control file
- Invalid number specified
- Invalid record
- Missing colon
- Parameters should be "T" or "F"

"Control File not found" tells you that CONTROL.BR is in a different directory from your current directory or User 0 of the current drive. The remaining messages indicate an omission or an invalid record in CONTROL.BR. In some instances, BackRest displays the invalid records. See BACKREST.DOC for guidance in correcting errors in CONTROL.BR.

Fatal Error !!
Message

BackRest Error. A "fatal" BACK and REST error condition causes you to return to the operating system level where you must correct the error condition before reinvoking BackRest. When a file on PC DOS media is specified in such a message, BackRest displays the path to that file. The following messages can appear in a fatal error message.

- Can't append to DIR.BR
- Can't open or close: DIR.BR@ Backup aborted.
- Can't open or close RESTORE.BR@ Restore aborted.
- Can't open: REPORT.BR or DIR.BR Backup aborted.
- Can't open: RESTRPT.BR or DIR.BR Restore aborted.
- Can't read DIR.BR@
- Can't read RESTORE.BR@.
- Handling PATHS.BR file. Backup aborted.
- Sector Error on control file filename.ext
- Undetermined write error on report file.
- Undetermined write error on work file.
- Write error on work file Backup aborted.

The above messages indicate a file input/output error. Check your media and your hardware.

Must be Concurrent 3.2   Backup aborted.

BackRest error. BackRest runs only under the version of Concurrent with which it is shipped.

No more directory space for report file.
No more directory space for work file.
No more disk space for report file.
No more disk space for work file.

BackRest errors. The above messages indicate insufficient disk space, either in the directory or the data area of the disk. Delete unnecessary files on the disk, or use a different disk.

Not enough memory to run.   Backup aborted.

BackRest error. See "Insufficient Memory" at the end of this appendix.

HELP.DAT not on current drive

HELP error. HELP.DAT must be stored in the same drive from which you enter the HELP [C] command. Change the current drive to the one with the HELP.DAT file and reenter the HELP [Create] command. The new HELP.HLP file is created on that drive.

Insert SYSTEM diskette in A: then PRESS Ctrl/Alt/Del...

Concurrent hard-disk system loader error. This message follows any error message that arises from the hard-disk system loader. After encountering an error condition in the hard-disk system loader, you must restart Concurrent from disk.

Invalid Attribute

SET error. You tried to SET a drive attribute to a file; for example, time stamps, a label name, or protection. Refer to SET [HELP] or SET in Section 7 for a discussion and examples of the SET options.

Invalid Command Option

CHSET, DIR, ERASE, ERAQ error. The option or modifier supplied is not valid. Refer to the HELP file for the command you are using

Invalid Drive
Invalid Drive Specification

This error can originate in a number of different Concurrent commands. The message indicates that you specified a drive that does not exist in your system. Concurrent supports drives A through H, plus drive M (MDISK) and the floating drives, N and O.

Invalid 8087 State, IGNORED

8087 error. The 8087 command has two valid settings, ON or OFF. This message is displayed if you enter a value other than the valid settings.

Invalid entry number

STOP error. STOP assigns a number to each program it can terminate. The number you selected for termination does not correspond to any of the numbers in STOP's menu.

Invalid file name: filespec
Invalid Filespec.
Invalid Filespec (drive|filename|file extension|password)

CHSET, COPY, DIR, REN, TYPE error. The filename, file extension, password, or drive specifier for the file you requested is incorrect. Correct the filespec and reenter the command line.

Invalid hard disk system partition

Concurrent hard-disk system loader error. The system loader is unable to read information in the Partition Table. You must restart Concurrent from disk to continue operation. Use HDMAINT to recreate the CP/M partition on the hard disk.

Invalid Parameter

SET error. The SET option you specified must have a filespec entered with it. Enter SET [HELP] or see SET in Section 7 for the correct syntax.

Invalid Partition Table

Concurrent hard-disk system loader error. More than one partition is marked as bootable (able to start Concurrent), a nonexistent partition is marked as bootable, or there is a hard-disk failure. You must restart Concurrent from the Startup disk to continue operation. Use HDMAINT to clear the bootable partitions.

Invalid User Number, IGNORED

Invalid user number

COPY or USER error. You have specified a user number greater than 15 or less than 0. User numbers are from 0 to 15. Reenter the command line using a valid user number.

Invalid Wildcard

REN error. REN does not accept wildcards, ? or *, in file specifications, unless the wildcards are in exactly the same place in the old and new names, for example, REN newprog.*=oldprog.* works, but REN *.new=oldprog.* does not. Reenter the command line with a specific filename, or matching wildcards.

Missing directory

CHDIR, MKDIR, RMDIR, or SYSDISK error. In specifying a subdirectory, you have omitted a directory from hierarchical sequence of directories.

No CPM.SYS or CCPM.SYS file on the hard disk

Concurrent hard-disk system loader error. The file or files are not copied to the partition, or the filename is spelled incorrectly. You must restart Concurrent from the Startup disk to continue operation. Use PIP to copy CCPM.SYS or CPM.SYS to the CP/M partition.

No File

DIR, ERASE, REN, and FUNCTION error. This message indicates that Concurrent could not find the file specified in your command line or that the specified file does not exist. Make sure that you have spelled the filename correctly and that the disk containing the file is in the correct drive. Also, make sure that you are in the user number or directory where the file is located.

No such file to rename

REN error. The file you specified as the oldfile in a REN command does not exist. You might have put the oldfile first and the newfile second. REN command syntax is: REN oldname newname. Reenter the command line with the correct filename and the correct syntax.

NO SYSTEM or BAD SYSTEM on boot disk!

Concurrent hard-disk system loader error. Concurrent cannot be loaded from the PC DOS partition because the partition does not contain a copy of the system loader or the the system loader information is defective. Use HDMAINT to write new Concurrent system loader information to the PC DOS partition.

Not enough memory to load system

Concurrent hard-disk system loader error. The file CCPM.SYS copied to the CP/M partition cannot be loaded because your computer does not have enough memory. Make sure you have at least 256K of memory in your system. If you have enough memory, use PIP or COPY to copy the correct version of CCPM.SYS to your CP/M partition.

Not erased: filespec Currently Opened

ERASE, ERAQ error. Some other program is currently using the file you tried to erase. Either wait until the program is finished or terminate it before you reenter the ERASE or ERAQ command line.

Not erased: filespec read only

ERASE, ERAQ error. You tried to erase a file that is Read/Only. Use the SET command to set the file to Read/Write. Refer to SET [HELP] or SET in Section 7 for more information.

Not renamed: filespec already exists, delete (Y/N)

REN error. You specified the name of an existing file. If you enter a Y, the existing file is deleted and the file you want to rename takes its name. If you enter an N, nothing happens and Concurrent returns the command line prompt.

Not renamed: filespec Currently opened

REN error. The file you tried to rename is currently open on a different window. Either wait for the program to finish or terminate it before you reenter the REN command line.

Not renamed: Invalid File

This message indicates a command line syntax error. Enter HELP REN or see REN in Section 7 for the correct syntax and reenter the command line.

Overflow interrupt from "processname" at address nnnn:nnnn
Press any key to stop process.

XIOS error. "processname" stands for a running process; "address" is a memory address. This message occurs when a multiply or divide operation in a program generates an overflow. Press any key to continue using Concurrent.

Parity error from processname at address nnnn:nnnn
      **** MACHINE IS HALTED! ****

XIOS error. "processname" stands for a running process; "address" is a memory address. Some memory operation generated a parity interrupt, not necessarily in this process at this address. In order to resume operation of the personal computer, you must turn the power off and then on again. This message indicates a hardware problem. Take note of the situation when you receive the message and notify the dealer from whom you purchased your personal computer or an authorized service representative.

Password Error

ERASE, ERAQ, REN error. You specified a password-protected file without the password, or with an incorrect password. Reenter the command line with the correct password in the file specification, d:filespec;password.

Physical disk error

CHDIR, MKDIR, RMDIR, or SYSDISK error. Concurrent was unable to read from or write to a disk because of a defective medium.

Printer busy

XIOS error. This message occurs when you attempt to use the printer when a program on a different window is using it already. Wait until the first program is finished with the printer or use STOP to end execution of that program.

Printer n not on-line

XIOS error. The printer specified by the number n is not on-line.
Check to make sure that the printer is connected and turned on.

Printer n out of paper

XIOS error. The printer specified by the number n is out of paper.
Reload paper.

Reading file HELP.HLP
Reading HELP.HLP index

HELP error. An error occurs while reading HELP.HLP. This message
indicates a damaged disk. Ensure that the disk is in place and
retry the operation. If the error persists, the disk is damaged and
must be replaced. Use PIP to copy as much of the damaged disk as
possible to a fresh disk, and copy the HELP.HLP file from your
backup copy.

Select Error

SET error. This message indicates one of two errors:

● The drive specified is not part of your system. Concurrent
  supports up to eight physical drives, lettered A through H, plus
  the MDISK, drive M, and the floating drives, N and O. Reenter the
  command line with a valid drive specification.

● This error occurs when there is a hardware error. Refer to the
  "Error Handling Procedures" at the end of this appendix for a
  discussion of possible hardware errors.

System file is defective: CCPM.SYS (or CPM.SYS)

Concurrent hard-disk system loader error. File named CPM.SYS or
CCPM.SYS on the CP/M partition does not contain the CP/M-86 or
Concurrent operating system. You must restart Concurrent from the
Startup disk to continue operation. Use PIP or COPY to transfer a
valid copy of the operating system to the CP/M partition.

The disk you inserted contains backed up files,
Please remove it and insert a new CP/M Media disk.
Touch RETURN key when ready ==>

BackRest (BACK) error. Use blank or reusable disks for a BACK
operation. If you intend to use a disk that contains backed-up
files, you must set the REUSE: record in CONTROL.BR to true. If you
are using a PC DOS disk, "CP/M" is replaced by "DOS" in this
message.

The selected program could not be stopped.

STOP error. This message indicates that the program you selected for termination is no longer running.

The system drive is off

SYSDISK error. Use SYSDISK to turn the system drive feature back on before assigning a drive as the system drive.

This command/option requires CP/M media.

INITDIR, SET, and SHOW error. The selected command or option does not work with PC DOS media. For example, you cannot use INITDIR with a PC DOS disk, or use SET to password protect a file on a PC DOS disk.

Too many directory entries for query

ERAQ error. You used a wildcard and specified too many files for ERAQ to query. Try breaking the group of files into two or more smaller groups, then enter a separate ERAQ command for each group.

Unable to load file as generated

Concurrent hard-disk system loader error. File named CPM.SYS or CCPM.SYS does not contain the CP/M-86 or Concurrent Operating System. You must restart Concurrent from the Startup disk to continue operation. Use PIP to transfer a valid copy of the operating system to the CP/M partition.

Unexpected Interrupt

XIOS error. This message occurs when Concurrent traps an interrupt it cannot deal with. In many cases such interrupts are generated by application programs' calls to the   ROS. ROS calls are not supported in Concurrent. You must restart Concurrent to resume use of your computer.

Warning, System Error. Please check your hardware.

BackRest Error.

Wrong volume...Please insert in drive d: disk volume: nn
Touch RETURN key when ready ==>

BackRest (REST) error. You have inserted a disk with the incorrect backup volume number during a restore operation. Insert the disk specified by the disk volume number in this message.

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MT   Management Tasks
NC   Network Components

P   Printers
R   Reference
SU   Setting Up

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