

AMOS/L VIDEO CASSETTE RECORDER BACKUP SOFTWARE

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CHAPTER 1

THE PROLOGUE

1.1 THE CONTENTS OF THIS MANUAL

This document introduces you to the techniques of Video Recorder Backup. It gives you the information you need to copy disk files to a video cassette, restore files to the disk from a video cassette, and display the directory on a cassette to find out which files are stored there.

In addition, users of Winchester technology disk systems will learn how to prepare a Warm Boot monitor file and store it on tape for later use in resetting their system directly from a video cassette.

1.2 OTHER REFERENCES

Before you install an AM-610 Video Cassette Recorder Interface, you must be aware of certain hardware prerequisites. Refer to the information contained in Section 1 and Section 4 of the Alpha Micro Integrated Systems User's Guide, DWM-00101-00.

The Video Cassette software can also be used with the AM-1000. See the AM-1000 Owner's Manual, DSS-01000-00, for information on installing the Video Cassette Recorder on an AM-1000.

1.3 GRAPHICS CONVENTIONS

This manual conforms to other Alpha Micro publications in its use of a standard set of graphics conventions. We hope these graphics simplify our examples and make them easier for you to understand.

PPN A Project-programmer number. This number identifies a user account (such as, [100,2]). We also represent an account number as [p,pn].

Devn: A device specification. This abbreviation represents a logical unit of a physical device. Such a specification usually refers to a disk, but it can represent any valid system device (such as a magnetic tape drive or a printer for which a special driver program is required).

Filespec A file specification. Such a specification identifies a file. It usually has these elements:

Devn:Filename.Extension[p,pn]

{ } Optional elements of a command line. When these symbols appear in a sample command line, they designate elements that you may omit from the command line.

 Underlined characters indicate those characters that the monitor prints on your terminal display. For example, whenever you see an underlined dot, ., this indicates the prompt symbol that the operating system prints on your terminal when you are at monitor command level.

RET Carriage return symbol. The RET symbol marks the place in your keyboard entry for you to press the RETURN key. For example, ".LOGOFF **RET** " tells you, "After an AMOS/L prompt, type LOGOFF and press RETURN."

CHAPTER 2

INTRODUCING THE VIDEO CASSETTE RECORDER INTERFACE

The AM-1000 and AM-610 Video Cassette Recorder Interfaces make it possible for you to make backup copies of your disk files on video cassettes, restore files from cassettes to disk, and (if you have Winchester technology disks on your system) to perform a special system reset procedure known as a "warm boot" in case your System Disk gets erased or written over accidentally.

Users who already own video cassette recorders will appreciate being able to add them to their systems, and users who purchase video units primarily for use with their Alpha Micro systems will appreciate being able to use them for other purposes such as employee training, sales presentations, and so forth.

2.1 THE VIDEO CASSETTE RECORDER (VCR)

The AM-610 and AM-1000 Video Cassette Recorder Interfaces allow you to attach any standard home video cassette recorder to your Alpha Micro computer. You can use either a Beta or Video Home System (VHS) format machine and any tape speed setting (standard play, long play, or extended long play). (Although Alpha Micro distributes the software only on VHS format cassettes, you will be able to obtain all the relevant programs on whatever storage medium is most convenient for you. Consult your dealer.) Alpha Micro supports both American and International formats for VCR reception.

Each brand of video cassette recorder has slightly different operating instructions. For example, some units require that both the PLAY and RECORD buttons be pressed simultaneously to record, while on other units only the RECORD button needs to be pressed.

Please note that throughout this manual we say simply press the RECORD button to record. Consult the instructions that accompany your video cassette recorder to determine the correct way to operate your individual unit. The instructions that came with your VCR will also explain the manual procedures for loading and removing cassettes, connecting cables, and the operation of other controls.

2.1.1 VCR Maintenance

It is very important that the read/write heads of the VCR be kept clean. As the heads become dirty, the number of data errors you see will increase. In fact, if you begin to see more data errors as time goes by, the first thing you can suspect is that your VCR heads need cleaning.

For information on performing preventive maintenance on your VCR and on cleaning the heads, please refer to the owner's manual that accompanied your VCR.

2.1.2 Recording Speed

Most VCRs allow three tape speed settings: standard play, long play, and extended long play. For maximum data reliability, we recommend that you not use the extended long play mode. Or, if you do use extended long play, we recommend that you specify extra copies to the VCRSAV command to increase data reliability. (See Chapter 4 for information on VCRSAV.)

2.2 THE CASSETTES

You can use either 60/120 minute, 120/240 minute or 90/180 minute (Beta) cassettes with your Alpha Micro system, but there are a few limitations. Video cassettes were not originally intended to record data, and as a result exhibit a higher error count than other types of magnetic tape. To create a backup medium as reliable as other methods, blocks of data are repeated when they are recorded on a cassette.

This repetition affects the amount of data that can be stored on a single cassette. As the VCR unit records data, it automatically stores multiple copies of the data on the cassette, and you can specify more extra copies if you wish.

To protect data that is already written on a cassette you can break off the plastic tab on the back of the cassette. This prevents the recorder from recording on the cassette. When you decide that you no longer wish to save the data, you can place a piece of gummed tape over the tab opening and record as usual.

It is difficult to predict exactly how much data you can store on one video cassette. The capacity depends on the length of the tape, the recording speed, the number of copies, and the type and number of files being transferred. Also, the length of time it takes to back up a group of files can be from a few minutes to several hours for the same reasons. You will have to experiment with your own system to determine the amount of data you will want to save on a single cassette.

2.2.1 Verifying Cassettes

Although the VCR software contains internal controls to make sure that the data written on a cassette was copied correctly, after a great many saves on the same cassette, you will find that the cassette media may begin to wear out, resulting in soft errors, much the same as standard 9-track magnetic tape will wear out.

Some number of soft errors on a cassette is perfectly normal, and does not indicate that any data was lost, but if the ratio of total blocks read to soft errors is less than 100 to one, you should suspect that your cassette is beginning to wear out, that the read/write heads on your VCR need cleaning, or that some other potential problem is beginning to occur with your equipment.

To keep track of the condition of your media, we recommend you use the CRT610 command with the /CHECK option after every data backup to check the cassette. CRT610/C will give you the reliability ratio of the cassette. You may want to write this ratio on the cassette case itself, so that you can be aware of any deterioration that occurs.

Although new cassettes can be used without any preliminary preformatting, it is a good idea to use CRT610 to verify new cassettes before you use them (at least one cassette per batch) so that you are sure that the cassettes are of good quality.

(Chapter 7 contains more information on soft errors and on the CRT610 command.)

2.3 INSTALLING THE VIDEO RECORDER SOFTWARE

NOTE FOR AM-1000 OWNERS: If your AM-1000 contains a VCR interface, the software installation steps discussed below have already been done on your system. Skip to the next section, "Important Considerations."

After the hardware components are attached to your system, there are only a few steps to perform before you can use your video recorder to backup disk files or to create a warm boot cassette.

First, the DEVTBL statement in your system initialization command file must be modified to include the video recorder interface. The video cassette recorder is not a sharable device, so place it after a slash on the DEVTBL command line. For example:

```
DEVTBL HWK0,HWK1,/VCRO
```

The /VCRO identifies the video recorder unit and indicates that it is a nonsharable device. Only one video recorder may be attached to each system. Note that a comma must precedes the /VCRO on the command line.

Secondly, if you are going to restore to any non-DSK devices, you should include the drivers in system memory for those devices by using the SYSTEM command in the system initialization command file. For example:

```
SYSTEM HWK.DVR[1,6]
```

Note: If you do not want to place the drivers into system memory, you may load the drivers into a user memory partition at the time of the restore by using the LOAD command.

You must also make sure that the 610DVR.DVR file that was supplied to you with your current software is in account [1,6] of your System Disk and that you make another copy of it called VCR.DVR.

All the various files and programs you need are supplied to you on the current software release. If you received your software on a video cassette, you may use the VCRDIR command to display a directory of its contents, and copy the files it contains to your System Disk using the VCRRES command. These commands are described later on in this manual and also in the AMOS/L System Commands Reference Manual, DSS-10004-00.

2.4 IMPORTANT CONSIDERATIONS

When you are backing up or restoring disk files, there can be no other active users on the system.

NOTE: It is not possible to perform multiple tape backups. If you try to copy more data than one cassette can hold, your computer cannot tell when the VCR unit runs out of tape and you will lose some of your data even though the directory file at the beginning of the cassette lists all the files you selected.

If you need to restore to a non-DSK device, you will have to load the driver program for that device into your user memory partition if it is not already in system memory. You do this with the LOAD command. For example, to load the driver for a mini-floppy disk (MIN):

```
LOAD DVR:MIN
```

To verify that all of the data you wanted to save was really written to the cassette, use the CRT610 command with the /C or /F options (see Chapter 7). The CRT610 command will read all of the data on the cassette. If everything that is in the directory file is on the tape, you will see the "Certification is complete" message. If this message does not appear, it means that some of your files were not saved to the tape.

When you are using any of the video cassette recorder commands, you may see the following error message:

```
?Cannot READ VCRO: - device error
```

This message can appear at any time, and it indicates a problem either with the tape cassette or with the VCR unit itself. Restart the program you were using at the time of the error. If the error appears again, use the CRT610 command with the /CHECK switch to certify the cassette.

If there are any hard errors on the tape, substitute a known good tape and run the program you were using again. If you still get the device error message, there is evidently a problem with the video cassette recorder. Contact your dealer for further diagnosis.

If you have used the AMOS/L command SET DSKERR (see the command reference sheet for SET), the system may display the following error during VCRRES:

```
VCR ERROR. Lost block nnnnnnn
```

The "n"s represent the number of the block of data that was lost. You will see one such message for each block of data lost. This problem could be caused by a number of conditions, such as an error on the tape or because your memory partition was filled. You can try to restore again, and/or use CRT610 to check the cassette.

CHAPTER 3

THE FILE BACKUP PROGRAMS

Saving and restoring data on video cassettes is the primary function of the AM-610 and AM-1000 Video Cassette Recorder Interfaces, and this is what you will probably use the VCR for most of the time. The three programs described in the following chapters allow you to back up and restore random and sequential disk files easily and quickly, and to examine the directory of files at the beginning of each video cassette.

The Alpha Micro video cassette recorder backup system consists of three programs. They are:

- a. VCRSAV - saves files from a disk to a video cassette tape.
- b. VCRDIR - lists the contents of the directory file of a video cassette tape.
- c. VCRRES - restores files from a video cassette tape to a disk.

These programs are used with both the AM-1000 and AM-610 Video Cassette Recorder Interfaces, and they allow you to back up and restore random and sequential disk files easily and quickly. You can back up multiple disk surfaces on a single cassette. All the programs have full wildcarding capability.

These programs store and read data on the video cassette tape in a special format developed by Alpha Micro. This format was optimized for the characteristics of the Alpha Micro computer and its video cassette tape subsystem. It was not intended that this format be used for data interchange with other, non-Alpha Micro computers.

IMPORTANT NOTE: Remember that this set of programs was designed as a method for backing up disk files. That means that VCRSAV writes disk files to video cassette along with their full device and account specifications.

Therefore, when using VCRRES or VCRDIR to read a video cassette, if you want to access a specific file, you **MUST** specify the disk and account from which the file was backed up. For instance, if you stored a file on tape from DSK2:, you must specify the device specification "DSK2:" when you restore the file from the tape. You will find specific examples in the sections below.

3.1 WILDCARD FEATURES

VCRSAV, VCRRES, and VCRDIR use wildcard symbols and specification defaults in the same way that COPY and DIR use them for disk file management. For this reason, they are called "wildcard commands."

Wildcard commands differ from other AMOS/L commands in that besides accepting the standard AMOS/L file specification:

```
Devn:filename.extension[P,pn]{/switches}
```

they also accept a variety of wildcard specifications. A wildcard file specification allows you to select multiple files with only one file specification. These file specifications can contain the special wildcard symbols *, ?, [], and ALL:. For example, to specify all files in all accounts of DSK0: that have a .BAS extension, wildcard commands permit the file specification:

```
._DSK0:*.BAS[] (RET)
```

(In the example above, the symbol * stands for all possible filenames, and [] stands for all accounts.) In addition, the wildcard commands allow you to set account, device, and switch specification defaults. For example, the wildcard command line:

```
._VCRSAV [100,2]*.BAS,*.TXT[117,6],*.LST (RET)
```

sets the default account specification to [100,2]. The command line thus selects all .BAS and .LST files in account [100,2], and all .TXT files in account [117,6]. Notice that the account specification setting the default occurs before the filename and extension rather than after it, as is the case with a standard AMOS/L file specification.

3.1.1 Switches

"Switches" are option requests. Each switch must begin with a slash (/). Remember that wildcard commands recognize two types of switches: "file" switches and "operation" switches.

An operation switch applies to all of the file specifications on an entire command line no matter where it appears on that command line. A file switch may apply to only specific file specifications, depending on where it appears on the command line.

If a file switch appears at the end of a file specification, it applies only to the files selected by that specification. For example:

```
_VCRSAV *.BAS,*.TXT/QUERY,*.LST (RET)
```

In the command line above, the /QUERY switch (a file switch) applies only to those files selected by the *.TXT file specification. If a file switch appears before a file specification, it becomes the default switch, and applies to all of the files selected by the following file specifications unless it is overridden for a particular file specification by another switch, or until a new default is set. For example:

```
_VCRSAV *.BAS,/QUERY*.TXT,*.LST,*.M68/NOQUERY,*.LIT (RET)
```

The /QUERY switch affects all files selected by the specifications *.TXT, *.LST, and *.LIT, but not the files selected by the specifications *.BAS and *.M68.

Because wildcard file specifications are extremely powerful, they can have very widely ranging effects. If you are not familiar with the way wildcard commands work, refer to the AMOS User's Guide, DMW-00100-35, before attempting to use wildcard specifications.

CHAPTER 4

HOW TO BACK UP DISK FILES ONTO VCR CASSETTES (VCRSAV)

This chapter contains information on backing up files onto a VCR cassette. First we discuss some general backup procedures, and then we talk about the VCRSAV command itself.

4.1 BACKUP PROCEDURES

It is very important that you back up your files on a regular basis. The particular file backup procedure you use should be tailored to the needs of your particular system. For example, if a great deal of important data is changed or created every day, you may want to back up every night. If file updates are done only once or twice a week, you may want to back up only once a week.

IMPORTANT NOTE: As with any file backup, your backup procedure should make sure that the data on the disk is valid before doing the backup. You should run DSKANA on each disk to check the file structure of the disk before saving the disk files onto a cassette. If you do not check on the condition of your disk before saving files, you could run into problems. If your disk does have an error on it, that error will be transmitted to the tape, making the restore process difficult or impossible. (See the AMOS/L System Commands Reference Manual, DSS-10004-00, for information on DSKANA.)

You should have several backup cassettes so that at any one time you have several backups. Here are four common ways that you can use your AM-610 or AM-1000 to perform backups:

1. The last thing before you leave for the night, put a backup cassette in the VCR and push the RECORD button. Then run a command file that invokes the VCRSAV command. In the morning, use CRT610 to check the backup cassette for hard errors.

2. If your VCR contains a time of day clock that allows you to program it to begin recording at a specific time, you can automate the backup procedure even more:

Some time during the day, program the VCR to start recording at a time chosen by you (for example, 2:00 AM). Then put a backup cassette in the VCR and set it to RECORD. Run a command file that contains the SLEEP command (to which you have specified 2:00 AM). Then, at 2:00 AM the VCR begins recording and the SLEEP program allows the rest of the command file to execute, invoking VCRSAV. Note that this procedure will lock up the terminal-- you would most likely do this just before leaving for the day. In the morning, use CRT610 to check the backup cassette for hard errors.

3. Some time during the day, program the VCR to start recording at a time chosen by you (for example, 2:00 AM). Then put a backup cassette in the VCR and set it to RECORD. Enter the appropriate VCRSAV command, and include the /WAIT switch, specifying the time of the backup. For example:

```
_VCRSAV ALL:*. *[]/WAIT:2:00 AM [RET]
```

VCRSAV will ask the questions it needs to build the tape label, and will then put the terminal to sleep until the proper time, when the backup will begin. Note that this procedure will lock up the terminal-- you would most likely do this just before leaving for the day. In the morning, use CRT610 to check the backup cassette for hard errors.

4. If you have the Task Manager system, you can program the VCR to begin recording at a specified time, and submit a control file that can run (at the specified time) a command file such as the first example below. See the AMOS/L Task Manager User's Manual, DSS-10010-00, for more information on the Task Manager and control files. In the morning, use CRT610 to check the backup cassette for hard errors.

IMPORTANT NOTE: Do not use a control file to run VCRSAV directly-- the Task Manager is one of the "users" who are locked out by VCRSAV, and therefore the system will lock up.

4.1.1 Typical Backup Command Files

Although you can always perform a VCRSAV backup manually by entering each response from the keyboard, command files provide a convenient way of using the VCRSAV command without a human operator.

The particular command files you might use will depend on your particular system, but here are two simple ones:

```
:T
VCRSAV ALL:*. *[]

TECH PUBS BACKUP (4/1/82)
BACKUP-02
Alpha Microsystems
Technical Pubs
J. Saxon
```

You must include a blank line (created by pressing RETURN) in the file at the points where VCRSAV asks you to "press RETURN when ready." In the Example above, the third line contains only a carriage return. You must also have two blank lines at the end for VCRSAV to work properly.

IMPORTANT: Do not put comments in command files that use VCRSAV. VCRSAV does not recognize the comments, and will interpret them as commands.

The next sample command file contains the SLEEPR command, which takes as an argument the time of day you want the rest of the command file to begin executing. (This should be the time of day you have programmed the VCR to start recording.) See the SLEEPR reference sheet in the AMOS/L System Commands Reference Manual, DWM-10004-00, for more information on SLEEPR.

```
:T
SLEEPR 2:00 AM
VCRSAV DSK1:*. *[],DSK3:[100,*],DSK4:*.TXT[]

TECH PUBS BACKUP
BACKUP-02
Alpha Microsystems
Technical Pubs
J. Saxon
```

This command file also must have two blank lines at the end.

If your system contains Winchester disks, you can provide extra security for those disks by having your command file spin the disks down after the backup is over-- this helps protect the disks if the power should go off for any reason sometime in the night after the backup. In fact, in the case of the sample command file below, you can have the drives spun down, spin them up for the backup, and then spin them back down again. For example:

```
:T
LOAD SYS:MOUNT.LIT
LOAD SYS:SLEEPR.LIT
MOUNT DSK0:/U
SLEEPR 2:00 AM
MOUNT DSK0:

MOUNT DSK1:

MOUNT DSK2:

MOUNT DSK3:

MOUNT DSK4:

DEL *
VCRSAV DSK1:*. *[],DSK2:*. *[],DSK3:*. *[]100,*],DSK4:*.TXT[]

TECH PUBS BACKUP
BACKUP-02
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MOUNT DSK0:/U
```

Note that if your command file spins the drives down before the backup, you must load MOUNT.LIT and SLEEPR.LIT into memory first (as we did in the first lines of the command file); otherwise, you will not be able to spin them back up again!

4.2 USING THE VCR

The VCR support software depends on you to make sure the video cassette is rewound to the beginning of the tape before starting the backup.

Sometimes just pressing the Rewind button is not enough. Many VCRs will rewind until the tape counter gets to zero, which may not be the beginning of the tape. Check visually to see if the tape is rewound, and if it isn't, you should press the Rewind button again.

Because it is very difficult to position the tape to a specific point in the middle of the tape, we recommend that you not add files to a tape you have already created.

The VCR support software also depends on you to make sure there is enough tape in the cassette to complete the file transfer. If you run out of tape, there is no error message to warn you that all the files were not saved (even though the directory file at the beginning of the

cassette shows all the files you selected). You will have to experiment to find out how much data you can save on one cassette.

NOTE: You can save space on a cassette by selecting all the sequential files or all the random files you want to save at once. If VCRSAV has to switch back and forth between random and sequential files, it uses up extra tape between files.

4.3 THE VCRSAV COMMAND

The VCRSAV command writes copies of disk files to video tape cassettes. The program accepts a standard wildcard file specification, which specifies the files that are to be backed up.

VCRSAV allows you to copy a warm boot monitor file and data files onto a cassette at the same time by means of the /BOOT switch. Read Chapter 8 to find out more about the warm boot. And when you want to restore the data files from a cassette that also contains a warm boot monitor, VCRRES automatically bypasses the warm boot monitor and restores the other files as usual.

You may back up files from any disk account onto tape whether or not the account is within the project you are logged into. Although VCRSAV writes the disk specification of the file to the tape cassette along with the file, it does not transfer any password that may be associated with that disk account.

In most cases when you enter VCRSAV, you will be reminded that VCRSAV will lock out the other users on your system. The terminal will display:

All other users will be suspended while VCRSAV is running.
Enter RETURN to continue or CTRL C to abort.

You should check with other users on your system before proceeding with VCRSAV. If another user should be reading from or writing to the disk when you enter VCRSAV, you both could be locked up. That is, VCRSAV would lock out all other users, but another user on the disk might already have locked up the disk you want to access, keeping you from copying from the disk!

The /TRANSFER switch can be used to transfer files to the tape without locking other users out of the system. See the example below.

Since VCRSAV writes the date and time of backup to the tape, remember to use the DATE and TIME programs to verify that the system date and time are correct before you use VCRSAV.

VCRSAV writes to the disk during its operation, therefore do not write protect your disk when using VCRSAV.

4.3.1 Command Format

Call the VCRSAV program and give a specification for the files you wish to back up (this specification may contain wildcard symbols).

```
._VCRSAV {Filespec1{/switch}} RET
```

The default file specification is *.* and the account and device you are logged into. The default switches are /NOQUERY, /NOHASH, and /COPIES:0.

4.3.2 VCRSAV Switches

The options available with the VCRSAV command are listed below. The placement of file switches within the command line modifies their effect. Operation switches affect the command itself, and so it does not matter where on the command line they occur. For more information about switches, see the AMOS User's Guide, DWM-00100-35. Remember to put a slash before the switch whenever you use it.

/QUERY	or /Q	Asks you for confirmation before selecting files. (file switch).
/NOQUERY	or /NOQ	Does not ask for confirmation before selecting files. (default, file switch).
/HASH	or /H	Calculates a hash total (file switch).
/NOHASH	or /NOH	Does not calculate a hash total (default, file switch).
/COPIES:n	or /C:n	Specifies the number of extra copies of each block of data to be copied onto a cassette (default is /C:0, operation switch). For a discussion of when to save extra copies see section 4.4. If you use /C with the /T switch, it will only be accepted if you specify 20 or more copies.
/TRANSFER	or /T	Allows you to save files to the tape without locking out other users on the system. Operation switch. If you do not specify otherwise with the /C switch, 20 extra copies will be saved. If you specify less than 20 copies with the /C switch, it will be ignored.

/WAIT:nn:nn {AM/PM} Allows you to specify a time for a backup to begin, in standard time or military time format. This command will lock up the terminal until the waiting period is over.

or **/W:nn:nn**

/BOOT or **/B** Creates a warm boot cassette (operation switch).

NOTE: You can use the **/HASH** switch to calculate hash totals for certain files to identify a particular version of the file. This will save time when you use **VCRRES** to restore files to the disk, because you can then specify the **/HASH** switch to transfer only the files that have different hash totals.

You can use the **/BOOT** switch to transfer a warm boot monitor to a cassette. You can put just a warm boot monitor on a tape, or you can have both a monitor and backup files on the same tape. The warm boot monitor will not interfere with the restoring of any backup files.

4.3.3 Operation

Type **VCRSAV** followed by the specification selecting the files you want to back up onto the video cassette; then press **RETURN**. For example:

_VCRSAV MEMO.TXT,SCHDLE.TXT[310,2] (RET)

VCRSAV now asks you for information to construct the tape label. This label information is displayed when you use **VCRDIR** to display a list of the files stored on the cassette.

- a. Input warm boot file name:
This line only appears if you specified the **/BOOT** switch. Enter the name of the the warm boot monitor file you generated with the **WRMGEN** program. The default specification is **DSKO:AMOSL.WRM[1,4]**. (Refer to the **WRMGEN** and **CRT610** command reference sheets for additional information.)
- b. Volume Name:
Enter a textual description of the tape. It can be up to forty characters long.
- c. Volume Id:
Enter the identification code you wish to give the tape. This can be a serial number, an abbreviated description, or other identification as long as it's no more than ten characters.

d. Installation:

Enter the name of your company or department. Maximum length is thirty characters.

e. System:

Enter the name of the computer system the tape is being created on. This thirty character field can be useful if your particular installation has more than one computer system.

f. Creator:

Enter the name of the person creating the tape. This field may be up to thirty characters long.

Next, VCRSAV warns:

All other users will be suspended while VCRSAV is running.
Enter RETURN to continue or CTRL C to abort.

(you will not see this message if you use the /T switch). If you use Control-C to exit, you see:

?Job aborted

and you are returned to AMOS/L command level.

If you continue, VCRSAV then tells you what files it is selecting. For example:

DSK2:MEMO.TXT to VCRO:DSK2:MEMO.TXT
SCHDLE.TXT[310,2] to VCRO:SCHDLE.TXT[310,2]
Total of 2 files in 126 blocks selected for transfer

You may also use wildcard file specifications. For example, if you want to back up only the .BAS files on the disk, you would enter:

._VCRSAV *.BAS[] (RET)

When you use the /QUERY switch, VCRSAV scans the disk, and asks for confirmation before selecting each file. Enter Y for yes, or N for no; it is not necessary to press the RETURN key. Remember that the placement of the /QUERY switch in the command line can affect which files it applies to. For example:

._VCRSAV *.M68,/QUERY *.BAS,*.TXT,*.LIT/NOQUERY,*.LST (RET)

All other users will be suspended while VCRSAV is running.
Enter RETURN to continue or CTRLC to abort.

.
 .
TERML.M68 to VCRO:TERML.M68
C4D.M68 to VCRO:C4D.M68
LSTSQR.BAS to VCRO:LSTSQR.BAS? Y
NEW.TXT to VCRO:NEW.TXT? N
STATUS.LIT to VCRO:STATUS.LIT
NEW.LST to VCRO:NEW.LST? Y
BM68.LST to VCRO:BM68.LST? Y
Total of 6 files in 126 blocks selected for transfer

Now the video recorder is activated, and the file transfer occurs.

The video software supports two different kinds of VCRs - the VIDEOTRAX remote-controlled Video Tape Recorder, which allows VCRSAV to operate the recorder for you, and manually operated VCRs, which you must operate according to VCRSAV's instructions. If you have a VIDEOTRAX system, you will simply see messages telling you the steps that VCRSAV is doing (and you can skip the rest of the instructions in this section). If you have a manually operated VCR, you will be prompted to ready the VCR unit:

Place cassette at load point.
Press RETURN on CRT when ready.

Load a cassette into the VCR unit and make sure it is completely rewound. When you press the RETURN key, this message appears:

Press RECORD on VCR.
Press RETURN on CRT when ready.

As VCRSAV copies each file, it displays a dot for each 15 files that it copies. You may use Control-C at any time to stop.

Beginning copy ..

When VCRSAV is finished, you see:

The transfer is now complete.
Press STOP on the VCR.
Total of 6 files in 126 blocks transferred

You should then use the CRT610 command with the /CHECK option to check the cassette. This assures you that the data transferred correctly. See Chapter 7 for information on the CRT610 command. After this check, you may rewind, remove, and label the tape for storage and future use.

IMPORTANT: Remember that the /CHECK process takes just as long as the file transfer, but it is time well spent. If you try to restore files from a bad tape, your current files on disk as well as the files on the cassette may be irretrievably lost.

4.3.3.1 Example of the /WAIT switch

When you specify /WAIT with VCRSAV, the save process becomes fully automated, and set to begin at the time you specify. For example, say that you want your backup to begin at eight o'clock in the evening. You specify:

```
_VCRSAV/WAIT:8:00 PM MYFILE.TXT (RET)
```

VCRSAV will respond:

```
Remember to set the VCR timer  
The current system time is: 4:37 pm
```

Your job will then be put to sleep until 8:00 PM, when the save will begin. It is important to remember to have your VCR all set to record, so that it actually will begin recording when the program begins sending data.

4.3.4 Reserved File Names

Both the VCRSAV and the VCRRES programs create a temporary directory file named VCRTOC.IPF on the disk in the account you are currently logged into. This file is erased and recreated each time VCRSAV or VCRRES is used within the account. Therefore, do not write protect the disk that you are logged into. Do not use this filename for one of your own files since VCRSAV and VCRRES will write over it the next time you use one of these commands. Also, if you specify VCRTOC.IPF in a VCRSAV or VCRRES command line, VCRSAV and VCRRES will automatically bypass it.

There is also a file called FRGTBL.IPF that VCRRES creates and uses throughout its operation - do not use this name for any files.

4.4 WHEN TO SPECIFY EXTRA COPIES

You can specify extra copies whenever you use VCRSAV to create a backup cassette. Specifying extra copies will always increase the reliability of your backup cassette, but normally is not necessary since the VCRSAV program will automatically write the data on the cassette with enough redundancy to take care of most situations.

However, there are five situations that can occur in which you should specify extra copies:

1. Your system initialization command file has SET VERIFY on.
2. You are creating a cassette for data transfer to another Alpha Micro computer system.
3. You are creating a cassette that will be read by a different VCR than the one that you used to write the cassette.
4. You will be restoring to a different type of disk than the disk you saved from.
5. You are using the /TRANSFER switch. This switch has a default of saving twenty extra copies of each block of data-- you cannot specify less than twenty when using the /T switch. If your system has many users, or is very busy, you may want to specify more copies.

4.4.1 SET VERIFY Option

If you are going to restore your backup cassette with SET VERIFY on, then you must specify at least four extra copies when you make the cassette.

The VERIFY option, when set, causes the monitor to perform a read operation after every disk write. This slows down the file restore process when you use VCRRES; because of its critical timing requirements, VCRRES needs the four extra copies to compensate for this decrease in restore speed.

Of course, an alternative to specifying extra copies would be just to turn off the VERIFY option before restoring a cassette by entering:

```
._SET NOVERIFY (RET)
```

4.4.2 Ensuring Extra Data Reliability

The standard software provides a reliable transfer method. However, if you are creating a cassette to transfer data to another Alpha Micro computer system, you will usually be transferring a relatively small amount of data, and will have plenty of room on the cassette for extra copies. In this case, specifying extra copies, while not strictly necessary, will provide extra redundancy to allow for the effects of improper handling or equipment of marginal quality.

Another reason for specifying extra copies in this case is that you probably don't know what kind of disk and video cassette recorder the user on the other computer system is going to use to restore your cassette. (The next few sections discuss why differences in equipment may require that data be saved with extra copies.)

4.4.3 Differences in Video Cassette Recorders

If you are going to restore data using a different VCR than the one you used to save the data, you may want to specify a few extra copies.

Because there are differences between VCRs (especially between different brands of VCRs), a cassette that is just barely acceptable on one VCR may, because of these slight differences, be unacceptable on another VCR.

If transferring between two VCRs is a regular procedure on your computer system, it would be a good idea to try recording on one VCR and certifying on another to determine if extra copies will, in fact, be necessary.

4.4.4 Differences in Disk Speeds

If you are restoring to a different type of disk than the one you saved from, you may need to specify extra copies to compensate for differences in disk speeds.

You can always restore to the same type of disk that you saved from without specifying extra copies. For example, if you have saved data from an 10Mb Winchester disk that contains two logical devices, you should always be able to restore to another (or the same) 10Mb Winchester disk that contains two logical devices.

VCRSAV automatically saves the data to the cassette with enough redundancy for successful transfer of data between the same type of disks.

However, if you will need to restore to a different type of disk than the one you saved from, you may need to specify extra copies when you create the cassette. This is because different types of disks operate at different speeds. Because neither the AM-1000 nor the AM-610 have any control over the VCR except to read data from and write data to it, the VCR can only send data at a constant speed.

If you restore to a slower disk than the disk you saved from, the redundancy of the data on the cassette may not be enough to cover for the slower speed of the disk you are restoring to, and some data may be lost. (Note that if you save from a slower disk and restore to a faster disk, there is no problem-- you will have more than enough data redundancy to satisfy the needs of the faster disk.)

We have determined that, in general, ten extra copies is enough to compensate for the difference in disk speeds even when saving from the very fastest disk and restoring to the slowest type of disk supported by Alpha Micro.

However, for other combinations of disk types, as little as five or six extra copies will suffice. Because specifying extra copies does cut down on your cassette capacity and will slow down your backup, you should determine for yourself how many (if any) extra copies are needed when saving and restoring cassettes using your own disk drives.

The following list contains some of the disk drives supported by Alpha Micro, and their speeds relative to one another. Remember that "slower" in the case of a disk drive is a relative term, as the speed differences are slight. In order of relative speed (fastest to slowest disks):

- 1) 14" 400 Megabyte Winchester
- 2) 8" 140 Megabyte Winchester
- 3) 8" 70 Megabyte Winchester
- 4) Phoenix, Hawk, Trident
- 5) 14" 60 Megabyte Winchester
8" 60 Megabyte Winchester
8" 32 Megabyte Winchester
- 6) 5 1/4" 30 Megabyte Winchester
- 7) 8" 8.5 Megabyte Winchester
- 8) 5 1/4" 10 Megabyte Winchester

CHAPTER 5

HOW TO FIND OUT WHAT'S ON A VCR CASSETTE (VCRDIR)

The VCRDIR program displays a list of the files on a video tape cassette, and can also create a disk file containing the video tape directory. The video tape read by VCRDIR must previously have been written by VCRSAV.

VCRDIR can be run with or without locking the other users out of the system-- even if the tape was created without using /T. You will probably not want to lock other users out unless having them on the system interferes with VCRDIR.

If you are going to lock other users out, you should check with them before proceeding with VCRDIR-- if you are creating a directory listing disk file, and another user is reading from or writing to that disk when you enter VCRDIR, you both could be locked up. That is, VCRDIR would lock out all other users, but another user might already have locked up that disk, keeping you from writing to the disk! VCRDIR does not need access to the disk to just read the directory listing from the tape, but it will still lock out other users.

VCRDIR accepts full wildcard specifications, which select the files to be listed in the directory. (The account and device portions of the specification refer to the disk account and device from which the files were originally backed up.)

5.1 COMMAND FORMAT

To create a list of the files on a tape, enter the following command:

```
_VCRDIR {/switch}{Listfilespec}={inspec}{,inspec2...,inspecN} RET
```

where /switch is an option request.

To create

The optional Listfilespec specifies a disk file to contain the tape directory display. Inspec specifies the files on the tape whose directory listing you want to see.

Type VCRDIR followed by an optional Listfilespec and equal sign. Then type any input file specifications, and press RETURN. The Listfilespec specifies a disk file that will contain the directory display. If you omit the Listfilespec and the equal sign, VCRDIR sends the display to your terminal. If you omit the Listfilespec and include the equal sign, VCRDIR uses the default Listfilespec DIRECT.LST and the account and device you are logged into.

CAUTION: If you are logged into DSKD:[1,4], this will destroy a file that already exists (DIRECT.LST there contains your system software hash totals). Therefore, do not run VCRDIR while in this account.

The default inspec is *.* and the account and device you are logged into. This means that if you enter the command:

```
._VCRDIR (RET)
```

the list will only include those files that were backed up from the account and device you are currently logged into. If none of the files on the cassette were backed up from the account and device you are logged into when you use VCRDIR, you will see:

No such files.

The usual command, which will display the names of all the files on the cassette, is:

```
._VCRDIR ALL:[ ] (RET)
```

5.2 VCRDIR SWITCHES

- | | |
|-----------------|---|
| /KILL or /K | Deletes any existing Listfile that matches the specified Listfilespec before creating the new Listfile. Operation switch. |
| /TRANSFER or /T | Allows you to get the directory without locking other users out of the system. Operation switch. |

5.3 EXAMPLES

To send a directory display of all the .DAT and .M68 files on a video cassette to your terminal, enter:

```
_VCRDIR ALL:[]*.DAT,*.M68 (RET)
```

And you will see:

All other users will be suspended while VCRDIR is running.
Enter RETURN to continue or CTRL C to abort.

Or, if you used /T:

%CAUTION -- If your system is heavily loaded, use of the
TRANSFER switch could affect the ability to
get a directory of all of your files.
Enter RETURN to continue or CTRL C to abort.

If you use Control-C to exit, you see:

?Job aborted

and you are returned to AMOS command level.

If you have a VIDEOTRAX remote-controlled Video Tape Recorder, VCRDIR will operate the VTR for you. If you have a manually operated VCR, you will be prompted to ready the VCR unit:

Place cassette at load point.
Press RETURN on CRT when ready.

Load the cassette whose directory you want to display, make sure it is completely rewound, and press the RETURN key. Next you see:

Press PLAY on VCR.
Press RETURN on CRT when ready.

The cassette directory is read and stored in memory, then:

Place cassette at load point.
Press RETURN when ready.

Rewind the cassette. You may leave it in the VCR unit, if you wish, or you may remove it and return it to its storage location. After pressing RETURN, VCRDIR shows you the directory it just read. The display looks something like this:

Backup media is labeled as:

VCR TAPE01 09/14/81 (14:49)
Created on 14-Sep-81 at ALPHA MICRO on AM1022 by A.USER
4 Copies Saved

```

1 DSKO: SYS      M68 140,1 16 L 14-Sep-81 14:52:23 260-172-144-350
2 DSKO: NBSORT M68 140,1  4 L 14-Sep-81 14:52:25 374-154-406-025
7 DSKO: JANE    DAT 140,1 99 C 14-Sep-81 14:52:27
Total of 3 files in 119 blocks

```

If the directory display is longer than the screen, use the SCROLL key or Control-S/Control-Q to stop and start the display.

The label information was recorded when you created the backup cassette using VCRSAV. One line of data is shown for each file. "4 Copies Saved" shows that 4 extra copies were made of each data block. You may save up to 255 copies of each file. The first number on the line tells you the file's relative position on the tape. Next you see the device specification, the filename and extension, and the original disk account specification of the file.

The next number tells you the number of disk blocks the file takes up. The letter following the block count tells you whether the file is a linked (sequential) file ("L"), or a contiguous (random) file ("C"). Next, VCRDIR gives the date and time the file was originally backed up. And finally, VCRDIR displays the hash total if one was calculated when the file was backed up by VCRSAV using the /H switch.

In the display above, for example, VCRDIR says that the file NBSORT.M68 is the second file on the tape, that it was originally backed up from DSKO:[140,1], that it contains 4 disk blocks, that it is a linked file, that it was backed up on September 14th at 14:52:25 hours, and that its hash total is 374-154-406-025. At the end of the directory display, VCRDIR tells you how many files were listed in the display.

If the cassette contains a warm boot monitor, the display begins:

Backup media is B00Table and is labeled as:

This indicates that a warm boot monitor is the first file on the cassette even though it will not appear on the directory listing you just requested.

To create a disk file containing the directory display, specify a Listfile. For example:

```
._VCRDIR MYDIR.LST = ALL:[]*.DAT (RET)
```

This creates the file MYDIR.LST in the account and device you are logged into. It contains a directory display for all .DAT files on the tape. NOTE: If your printer has been defined on your system as a terminal, you may send the display directly to the printer by using an output specification of "TRM:Printer-name," where printer-name is the name assigned to the printer by the TRMDEF command in your system initialization command file.) For example:

```
._VCRDIR TRM:TI810=ALL:[]*.DAT (RET)
```

CHAPTER 6

HOW TO RESTORE FILES ONTO THE DISK (VCRRES)

Use the VCRRES program to transfer files from a video cassette tape to the disk. VCRRES only reads tapes that were created using the VCRSAV command, and you must specify the disk accounts and devices that the files were originally backed up from. It also allows you to rename the files being copied. VCRRES is a wildcard command.

If you want to restore files from a cassette that also contains a warm boot monitor file, VCRRES automatically ignores the warm boot monitor and allows you to restore the other files to the disk in the usual manner.

NOTE: It is a good idea to run DSKANA on your system after using VCRRES. This makes certain that nothing in the VCRRES process or on your tape caused any errors on your disk.

Most of the time when you enter VCRRES, you will be reminded that VCRRES will lock out the other users on your system. The terminal will display:

All other users will be suspended while VCRRES is running.
Enter RETURN to continue or CTRLC to abort.

You should check with other users on your system before proceeding with VCRRES. If another user should be reading from or writing to the disk when you enter VCRRES, you both could be locked up. That is, VCRRES will lock out all other users, but if another user already has locked up the disk you need to access, you will not be able to write to the disk!

If the tape contains twenty or more copies of each block, you can usually use the /TRANSFER switch, which allows you to perform the restore without locking other users out of the system. See the description of the switch below for instructions on when it can be used.

6.1 COMMAND FORMAT

To use VCRRES, enter the VCRRES command followed by an output specification, an input specification, and any optional switches.

```
_VCRRES{/switch}{outspec}={inspec1{/switch}{,inspec2{/switch}...}} RET
```

Type VCRRES followed by the optional output specification. Then type an equal sign followed by any input specifications, and press RETURN. The default switches are /NOQUERY, DELETE, and /NOHASH.

6.1.1 Output Specifications

The output specification defines which device and account the video cassette tape files are to be written to on the disk. It allows you to rename the files as they are written to the disk also, if you choose. The defaults for the output specifications are:

Filename: The infile specification

Extension: The infile specification

Account: The account you are logged into

Device: The device you are logged into

Therefore, if you do not specify a device (such as DSKO:), everything that you specified from the tape will be written to the device you are logged into. For example, if you are logged into DSKO:, everything on the tape will be written onto DSKO:, even if the files were written to the tape from other disks.

Be careful to specify an output specification if the files on the tape came from more than one disk. Unless, of course, you do want to transfer them all onto one disk.

If you are logged into the System Operator's account, [1,2], the default output specification is [] (all accounts). This means that files will be restored to their original account numbers (from which they were written to the tape).

6.1.2 Input Specifications

The input specification defines which files on the video cassette tape are going to be restored to the disk. If you enter an input specification, give the exact specification of the files you want to transfer from the video cassette, including the device and account specifications of the files as they were written to the tape. The input specification defaults are:

Filename: * (All filenames on the tape)

Extension: * (All extensions on the tape)

Account: The account you are logged into

Device: The device you are logged into

If you do not specify an input specification, VCRRES will default to the account and device that you are logged into. This is useful if all the files you wish to restore came from the same device/account. For instance, if you wish to restore the files on the tape that came from account [100,0] on the disk device you are logged into, you can do this by logging into [100,0] and typing:

```
._VCRRES = 
```

If you use ALL:[] as the input specification, VCRRES will restore all the files on the tape (where they will go to on the disk will depend on the output specification).

6.1.3 Command Format Example

If you wish to restore everything on the cassette to its original device and account number, log into [1,2] and enter:

```
._VCRRES ALL:[ ]=ALL:[ ] 
```

In this case, VCRRES will place all the files on the tape back in the devices and accounts from which they were copied.

You may not copy to a disk account if it is not in the project you are logged into unless you are logged into the System Operator's account, [1,2]. For instance, if you are logged into [100,1], you may not copy into account [101,1], but you could copy into accounts [100,0], [100,2], etc.

If you are logged into [1,2] and if the account you are copying to does not exist, VCRRES creates it. You may copy files into the account you are logged into from any other account, regardless of project number if you are in [1,2].

Whenever possible, you should log into the disk you are restoring to. For information on why this is a good idea, see Section 6.5.

6.2 VCRRES SWITCHES

You may use the switches below to select VCRRES options. Each switch must begin with a slash. Remember that the placement of the switch in the command line modifies its effect.

/QUERY	or /Q	Ask user for confirmation before selecting files (file switch).
/NOQUERY	or /NOQ	Don't ask for confirmation before selecting files (default, file switch).
/DELETE	or /D	Copy over to an existing file, thus deleting it (default, file switch).
/NODELETE	or /NOD	Don't copy over to an existing file (file switch).
/HASH	or /H	Restore only files that have different hash totals on the disk (file switch).
/NOHASH	or /NOH	Don't check hash totals (default, file switch).
/TRANSFER	or /T	Allows you to transfer files without locking other users out of the system. Operation switch. WARNING: Because with this switch you will be sharing CPU time with other users, the restore process could miss files if your system is being heavily used. Since VCRRES erases files of the same name on the disk before trying to restore from the tape, this means that you could lose files. What constitutes "heavy use" will depend on the system and the number of copies saved-- if you have any doubt about the restore, do not use this switch.
/SEARCH	or /S	Allows you to search for a specific file using the VCR's FAST FORWARD capability. The SEARCH is done without locking other users out of the system. Operation switch.

NOTE: If you use the /HASH switch with VCRRES, the file on the cassette must have a hash total that was calculated when you saved the file using the /HASH switch with VCRSAV.

6.3 EXAMPLES

Here are a few examples of how the VCRRES command works. For a start, say that you wanted to copy from a cassette all .TXT files that were originally backed up from account [110,2] on DSK2: over to your current account. You would enter:

```
._VCRRES =DSK2:*.TXT[110,2] (RET)
```

You may specify wildcard file specifications to VCRRES (as in the input specification *.TXT above).

If you want to ask for confirmation before each file selection, use the /QUERY switch. Enter a Y for Yes or an N for No after each VCRRES prompt. You don't need to press RETURN after your reply. For example, suppose you are logged into DSK2:

```
._VCRRES *.OLD[]=DSK3:*.TXT[10,*]/QUERY (RET)
```

All other users will be suspended while VCRRES is running.
Enter RETURN to continue or CTRL C to abort.

Or, if you used /T:

CAUTION -- If your system is heavily loaded, use of the
TRANSFER switch could affect the ability to
restore all of your files.
Enter RETURN to continue or CTRL C to abort:

If you use Control-C, you see:

```
?Job aborted
```

And you are returned to monitor level.

If you continue, and you have a VIDEOTRAX automatic Video Tape Recorder, VCRRES will operate the VTR for you. If you have a manually operated VCR, you will be prompted to ready the VCR unit:

Place cassette at load point.
Press RETURN on CRT when ready.

Make sure the cassette you are restoring from is fully rewound before you press RETURN. When you have done this, you will see:

Press PLAY on VCR.
Press RETURN on CRT when ready.

VCRRES reads the cassette directory into system memory. Next you see the message:

Reading Table of Contents from VCR
Place cassette at load point.
Press RETURN on CRT when ready.

Press STOP on the VCR unit, and rewind the cassette to the beginning. Now VCRRES displays a list of the files on the cassette that fit the specifications you entered earlier. If you used the /QUERY switch, VCRRES waits after the appropriate statement for you to respond Y for yes or N for no. You don't have to press RETURN. For example:

VCRO:DSK3:NEW.TXT[10,3] to DSK2:NEW.OLD[10,3] ? Y
VCRO:DSK3:B32.TXT[10,4] to DSK2:B32.OLD[10,4] ? Y
VCRO:DSK3:SCRTCH.TXT[10,6] to DSK2:SCRTCH.OLD[10,6] ? N
Total of 2 files in 78 blocks selected for transfer.

VCRRES has not yet copied over any of the files at this point. The program then displays:

Press PLAY on VCR.
Press RETURN on CRT when ready.

VCRRES then copies each file you selected to the disk. As it does this, it displays one dot for each group of 15 files on the tape to indicate its progress. For example:

Bypassing Table of Contents
Beginning copy

If a bad block is read from the tape, VCRRES writes a null data block to the disk in its place and reports the error by sending an asterisk to the display instead of a dot. For example:

Beginning copy*..*....

If the total data on your tape is less than 15 files long, you will not see any dots appear. You will, however, see error asterisks if a bad block is read. Section 6.3.2 below discusses bad blocks.

The program then displays:

Place cassette at load point.
Press RETURN on CRT when ready.

And when you have done this, it will print:

Restoring DSK3:NEW.TXT[10,3]
Restoring DSK3:B32.TXT[10,3]
Restoring DSK3:SCRTCH.TXT[10,3]

Restore completed
Deleting 'VCRTOC.IPF'

It is finished. Now you may remove the cassette and return it to its storage location.

Remember, you may not copy files into an account that is outside of the project you are copying from unless you are logged into [1,2] or are logged into the account you are writing to. If you are logged into [1,2], VCRRES will copy to any account, and will create the account you are writing to if it does not already exist. When you are logged into [1,2], the default output account specification is [].

6.3.1 Example of /SEARCH

Enter the command, switch, and the name of the files you wish to search for and restore:

```
._VCRRES/S CHAP6.TXT (RET)
```

VCRRES will display:

All other users will be suspended during actual restore, not while the SEARCHing is taking place.
Enter RETURN to continue or CTRL C to abort:

If you continue:

Place cassette at load point.
Press RETURN on CRT when ready.

Press PLAY on VCR.
Press RETURN when ready.

Then VCRRES will report:

Reading from table of contents.

VCRO: DSK1:CHAP6.TXT[100,0] to DSK2:CHAP6.TXT[121,1]
Total of 1 file in 10 blocks selected

Press STOP on VCR

The File Sequence Number is read from the Table of Contents that is on the tape, and designates where on the tape the file is. If the file that is being searched for is within the first 5 files of the front of the tape, the message:

Press PLAY on VCR
Press RETURN on CRT when ready

will appear. Otherwise, you will see:

Press FAST FORWARD on VCR
Press STOP at any time then
Press PLAY on VCR and
Press RETURN on CRT when ready.

Press FAST FORWARD, and run the tape for awhile, press STOP, and then press PLAY on the VCR and press RETURN on the terminal. The program will read the tape until it finds the start of the next file on the tape, and display:

Searching for # - nn
Currently at # - nn

For example, if CHAP6.TXT is sequence number 14, we might see:

Searching for # - 14
Currently at # - 09

In other words, CHAP6.TXT is still 5 files ahead of where we are. Press STOP again, and then FAST FORWARD. Wait less time, then STOP again, and press PLAY. Now let us say we get the message:

Searching for # - 14
Currently at # - 13

Press PLAY on VCR
Press RETURN when ready:

Now we are close enough to our file to begin the restore process:

Found file
Beginning copy...

If you go too far, and end up past the file you want, you will see:

Press REWIND on VCR
Press STOP at any time then
Press PLAY on VCR and
Press RETURN on CRT when ready.

By using the counter on the VCR, you can soon reach the correct part of the tape.

With the /SEARCH switch, all of the searching part (the FAST FORWARDING and checking for position) is done without locking other users out of the system. You can also use the /T switch at the same time that you use the /S switch, if your tape has the proper number of copies.

6.3.2 Bad Blocks

A bad block occurs when data from the tape was garbled during the transfer to the disk. Therefore, the disk copy of the data is incorrect, meaning that part or all of that block is "garbage". The bad block error message looks something like this:

Restoring DSK3:NEW.TXT[10,3]

%CAUTION. File contains at least 1 bad block!
Enter RETURN to continue:

Since the file has been restored to the disk already (and any file of the same name was erased), you will have to accept the file from the tape, even if it has bad blocks.

IMPORTANT NOTE: You may enter a Control-C at any time to stop the file transfer. But remember, some of your current files may have been erased from the disk. It is also important to run DSKANA after breaking the file restore process with a Control-C. VCRRES works with the bitmap as it copies files, and using Control-C may cause bitmap errors, that will be cleaned up by using DSKANA.

If you have DSKERR set, you may see this also:

VCR ERROR. Lost Block nnn

when you have bad blocks. The nnn specifies the number of the block that was lost. This error does not necessarily indicate a problem. It can occur because VCRRES is skipping over the space between files on the tape.

6.4 HINTS ON OPTIMIZING THE FILE RESTORE PROCESS

This section contains special notes on optimizing your system to increase the reliability of your file restores.

Normally, you can easily restore files without worrying about special restrictions or considerations. However, VCRRES has critical timing requirements that must be met. The following paragraphs discuss special situations that can slow down the restore so much that timing problems occur, resulting in some data being lost.

As we mentioned in an earlier section, neither the AM-610 nor the AM-1000 have any control over the VCR except to send data to it and receive data from it. That means that the computer cannot communicate with the VCR to tell it "Hold it! Slow down, I'm busy and can't catch all that data just now." Instead, no matter what happens on the computer's end, it must be able to keep up with the steady stream of data coming from the VCR.

Anything that "ties up" the computer, preventing it from catching the data streaming in from the VCR, can result in a bad file restore (i.e., incomplete files). If this should happen, VCRRES will display those files from which data was lost. Then you can try again, restoring just those files that were bad.

However, our intention in this section is to tell you how to prevent such problems from occurring in the first place.

Of course, the first thing to avoid if you are having restore problems is the use of the /TRANSFER switch. Any restore problems will simply be compounded if the monitor is sharing time with other users.

6.4.1 If your Winchester Contains Multiple Logical Devices

As we mentioned in an earlier section, it is always a good idea to log into the device you are restoring to. This is because VCRRES creates a special control file on the disk and account you are logged into. VCRRES consults this file once for every 15 files restored. If you restore to devices other than the one you are logged into, VCRRES must switch back and forth from the device it is restoring to and the device that contains the control file. This slows down the restore.

However, in the case of Winchester disks that contain multiple logical devices, it is even more important to log into the device you are restoring to. Because of the unique way Winchester physical units are configured to contain multiple logical devices, switching frequently between logical devices when restoring files takes a fair amount of time.

To avoid these timing problems, log into the Winchester logical device you will be restoring to before using VCRRES to perform the restore.

If you are restoring to more than one logical device, log into the "middle" logical device. For example, if you are restoring files to DSK1:, DSK2:, DSK3:, DSK4:, and DSK5:, log into DSK3:. This will help to reduce the amount of time used by the disk in switching back and forth between the logical devices.

6.4.2 If You Restore to a Non-DSK Device

As mentioned in Chapter 1, if you are going to restore to a device that is not designated as "DSK", the driver for that device should be loaded into system memory by the System Operator before using VCRRES to restore to that device.

The reason for this is that when the monitor accesses any non-DSK devices, the monitor must have access to the device driver. If it is not in either system memory or the user partition, it must be loaded from the disk, which takes additional time. This process can slow the file restore down, causing data to be lost. If you do not want to load the driver into system memory, you can put it into your own memory partition before using VCRRES by using the LOAD command.

6.4.3 If Your Disks Share Bitmaps

If the disks on your system share bitmaps, that is, if the bitmaps share common memory space, there is an important restriction you should know about. (The System Operator can tell you whether or not the disks on your system share bitmaps by looking at the system initialization command file.) If a cassette contains files from different logical devices, when you restore the tape you should restore the files from each logical device separately.

For example, if your system contains DSK0:, DSK1:, and DSK2:, instead of saying:

```
._VCRRES=ALL:[]*.DAT,*.BAS (RET)
```

you should say:

```
._VCRRES=DSK0:[]*.DAT,*.BAS,DSK1:[]*.DAT,*.BAS,DSK2:[]*.DAT,*.BAS (RET)
```

The first example tells VCRRES to first restore all .DAT files on every device on the system and then to restore all .BAS files on every device on the system. The second example tells VCRRES to restore all .DAT files and then all .BAS files on DSK0:, then all .DAT files and .BAS files on DSK1:, and finally, all .DAT files and .BAS files on DSK2:

The difference between the two examples is that in the first case, VCRRES must "jump" between disks every time it restores a file. This causes bitmaps to be read every time a file is restored. If your disks share bitmaps, the bitmaps must be switched in and out of memory for every file restored. The time it takes to do this can cause the computer to lose data, resulting in a bad restore.

In the second case, all files for each logical device are restored before another logical device's bitmap must be consulted. This keeps bitmap switching down to a minimum.

If using the VCRRES command in the second form is too inconvenient for your particular application, there are two things you can do, each of which will free you from worrying about the situation:

1. Have the System Operator change the system initialization command file so that bitmaps do not share the same memory locations.
2. Specify extra copies when using VCRSAV. By specifying enough extra copies, you can compensate for the time used to switch bitmaps. (The exact number of extra copies needed will vary depending on your particular disk and bitmap arrangement.)

6.4.4 If You Transfer Data Between Different Types of Disks

Under certain circumstances, data can get lost when you restore to a disk that is of a different type than the disk the data was saved from. The reason for this is the difference between the speeds of the two disk types.

If you restore to a disk that is much slower than the disk from which the data was saved, the computer may not be able to write to the disk fast enough to catch all of the data streaming in from the VCR. The cure for this situation is to specify extra copies when you originally use the VCRSAV command to save the files. For a more detailed discussion, see Section 4.4.

6.5 RESERVED FILE NAMES

Both the VCRSAV and the VCRRES programs create a temporary directory file named VCRTOC.IPF in the disk and account you are currently logged into. This file is erased and recreated each time VCRSAV or VCRRES is used within the account, therefore, the disk you are logged into must not be write protected. Do not use this filename for one of your own files since VCRSAV and VCRRES will write over it the next time you use one of these commands. Also, if you specify VCRTOC.IPF in a VCRSAV or VCRRES command line, VCRSAV and VCRRES will automatically bypass it.

There is also a file called FRGTBL.IPF that VCRRES creates and uses throughout its operation. Therefore, do not use this name for any of your files.

CHAPTER 7

VERIFYING AND CHECKING THE CASSETTE (CRT610)

After a video cassette has been used for quite a while, you may start to encounter errors of one sort or another. To determine if the tape cassette is the source of the problem, you can verify or check the cassette. A special program, CRT610, does this job for you and also enables you to prepare a warm boot monitor cassette.

Building the warm boot monitor and transferring it to a video cassette are explained in the next chapter. The CRT610 command does not lock other users out of the system, nor do any of the optional switches. This means that you can verify your cassettes without inconveniencing other users. In addition, CRT610 can also generate a disk file containing certification information, allowing a job to run CRT610 without being attached to a terminal.

Note: You should always use CRT610 with the /CHECK or /FILE options to check a cassette after you have created it.

7.1 CRT610 SWITCHES

You may use one of the optional switches below to choose the CRT610 function you want to perform.

/BOOT	or /B	Create a warm boot cassette using the warm boot monitor already created on disk by WRMGEN. This is the default if a filespec is given or if no other switches are specified (operation switch).
/VERIFY	or /V	Write a data pattern to the video cassette, read it back, and print the status of the tape (operation switch). NOTE: Any data already recorded on the tape will be destroyed.

/CHECK	or /C	Read a pre-recorded video cassette, and print the status of the tape (operation switch). Does not destroy data. Disables the /BOOT and /VERIFY switches.
/FILE	or /F	Read a pre-recorded video cassette, and send the status of the cassette to the file VCRSTS.LST instead of to the terminal. Otherwise, it functions exactly like the /CHECK switch (operation switch). Creates the VCRSTS.LST file on the device and account you are logged into, after deleting any existing file named VCRSTS.LST.

A "warm boot" is the procedure that you use to restore your AM-420 Winchester System Disk when it is erased or written over accidentally. A warm boot from cassette requires a special monitor file that you generate using the WRMGEN command and which is preinitialized with just enough information to get your system up and running on one terminal and in one memory partition.

You can then restore the damaged files to your System Disk from other cassette backups you have previously created using VCRSAV. (Refer to the reference sheets for VCRDIR, VCRSAV, VCRRES, and WRMGEN in the AMOS/L System Commands Reference Manual, DSS-10004-00 for further information.) We will discuss the warm boot procedure more fully in the next chapter.

7.2 COMMAND FORMAT

To use the CRT610 program, type CRT610 followed by an optional Filespec and an optional switch.

```
._CRT610 {Filespec}{/switch} (RET)
```

where Filespec is the specification of the warm boot monitor file that you want to copy onto a video cassette, and /switch indicates one of the various processing options you may select. The default Filespec for the warm boot monitor file is DSK0:AMOSL.WRM[1,4], and the default switch is /BOOT.

7.3 HOW TO VERIFY A CASSETTE

(/VERIFY Switch)

This function of CRT610 writes a specific data pattern onto the tape, and after asking you to rewind the tape, reads back the tape to make sure the data was recorded accurately. Statistics printed at the end

of this process indicate the error rate for the cassette. NOTE: Any data previously recorded on the tape cassette will be destroyed.

This data pattern can be checked visually by connecting a video monitor to the VCR. This will show you directly whether data has been written to the tape. The verification pattern spells out "Alpha Micro" in large block letters.

The /VERIFY procedure is:

1. Load a blank or scratch cassette into your video cassette recorder. (A scratch tape is one that has data on it you no longer want to save.) Make sure it's rewound, and type CRT610 followed by the /VERIFY switch and a RETURN. For example:

_CRT610/VERIFY (RET)

2. CRT610 acknowledges your request by displaying:

VERIFY

3. Now CRT610 asks you for more information.

- a. Enter cassette size (hours):

You can specify a value of one to six hours. The default is two. Press RETURN to continue.

- b. Enter number of copies:

The allowed values are from four to 255, and the default value is four. (This is the actual number of copies that will be written onto the cassette; it is not an additional number of copies as when you use the /COPIES: switch with the VCRAV command.)

The VCR cassettes were not originally designed to record data, and so are not as reliable as other types of magnetic tape; in order to ensure that your data can be recovered from the cassette, you must write multiple copies of each record to the cassette. (As a point of interest, CRT610 automatically generates sixteen copies of your warm boot monitor when you create a warm boot tape.) When you have entered the number of copies you need, press RETURN.

4. If you have a VIDEOTRAX Video Tape Recorder, you will now see messages explaining the steps CRT610 is taking as it certifies your tape. If you have a manually operated VCR, CRT610 prompts you to ready the VCR unit:

Place cassette at load point.
Press RETURN on CRT when ready.

Make sure the cassette is rewound to the beginning of the tape and is ready to record.

5. When you have done this, you will see:

Press RECORD on VCR.
Press RETURN on CRT when ready.

There is a ten second wait before CRT610 begins writing its data patterns to the tape.

6. The actual writing of data onto the tape may take quite a while-- several hours, in fact. The length of time will depend on how long you said the video tape cassette was.

While it is writing, CRT610 displays:

nnnn blocks written

and the display is updated every two seconds.

7. When CRT610 is finished writing, it displays:

The transfer is now complete.
Press STOP on the VCR.

8. CRT610 now tells you:

Reading entire cassette.

Place cassette at load point.
Press RETURN on CRT when ready.

Make sure the cassette is completely rewound and is ready to be read.

9. When you have done this, CRT610 displays:

Press PLAY on VCR.
Press RETURN on CRT when ready.

CRT610 now begins to read each block of data on the tape and check it for accuracy. Again, this may take a long time.

10. As it reads the tape, CRT610 displays the following statistics and updates them every two seconds:

Total Blocks Read - nnnn
Total Copies Read - nnnn
Total CRC Errors - nnnn
Total Hard Errors - nnnn
Reliability Ratio - nnn:1

Total Blocks Read is the number of unique blocks of data read from the tape. Total Copies Read is the total number of blocks read. Total CRC Errors is the number of bad copies read back. This number can vary widely depending on the recording speed and quality of the cassette and recorder unit. The Error ratio shows you how many CRC or "soft" errors occurred in relation to the number of blocks read. For example, a Reliability Ratio of 1000:1 means that one soft error occurred for each 1000 blocks read.

11. CRC errors are acceptable as long as the Reliability Ratio is greater than 100:1. (that is, if more than 100 blocks are read per error). If the ratio should drop below 100:1, a warning message will print out:

%Warning - Possible equipment/media problems.

This indicates either that the tape is bad or your VCR equipment has a problem. First check the VCR. One of the most common problems is simply that the recording heads are dirty. Also be sure that you have the right kind of connecting cable, and that the cable is not loose. If you determine that you have no technical problems, it probably is the tape. In that case, you probably want to discard the cassette, and use a new one.

A Hard Error means that a data block could not be recovered at all-- this usually means that the tape is bad and should be discarded. As with a soft error, check your VCR equipment for problems before discarding the tape.

12. If all four totals are zero, either the tape is completely bad, or the VCR unit is not connected to the system properly.

NOTE: You should write these totals on the outside of the cassette, to give you an evolving picture of how the tape is wearing. A high proportion of CRC errors compared to the number of copies indicate that hard errors might occur unless the number of copies is increased the next time the cassette is used.

13. Rewind and remove the cassette, and return it to its storage location.

7.4 HOW TO CHECK A PREVIOUSLY RECORDED CASSETTE

(/CHECK Switch)

This function of CRT610 reads the data already recorded on a video cassette and displays statistics upon completion that indicate the error rate of the data. It overrides the /BOOT and /VERIFY switches.

The /CHECK procedure is:

1. Load the cassette you want to check into your VCR unit.
2. Type CRT610 followed by the /CHECK switch, and press RETURN:

._CRT610/CHECK **(RET)**

3. CRT610 acknowledges your request by displaying:

CHECK
Reading entire cassette

4. If you have a VIDEOTRAX Video Tape Recorder, you will now see messages as CRT610 checks your cassette. If you have a manually operated VCR, follow CRT610's prompts, and shown below. First CRT610 will display the tape label, or %No tape label.

5. Then it will tell you:

Place cassette at load point.
Press RETURN on CRT when ready.

Make sure the cassette is rewound and is ready to be read.

6. When you have done this, CRT610 displays:

Press PLAY on VCR.
Press RETURN on CRT when ready.

CRT610 now begins to read each block of data on the tape and check it for accuracy. This might take quite a while, depending on how much data has been written on the tape.

7. As it reads the tape, CRT610 displays the following statistics which are updated every two seconds:

Total Blocks Read - nnnn
Total Copies Read - nnnn
Total CRC Errors - nnnn
Total Hard Errors - nnnn
Reliability Ratio - nnn:1

Total Blocks Read is the number of unique blocks of data read from the tape. Total Copies Read is the total number of blocks read. Total CRC Errors is the number of bad copies read back. This number can vary widely depending on the recording speed and quality of the cassette and recorder unit. The Error ratio shows you how many CRC or "soft" errors occurred in relation to the number of blocks read. For example, a Reliability Ratio of 1000:1 means that one soft error occurred for each 1000 blocks read.

8. CRC errors are acceptable as long as the Reliability Ratio is greater than 100:1. (that is, if more than 100 blocks are read per error). If the ratio should drop below 100:1, a warning message will print out:

%Warning - Possible equipment/media problems.

This indicates that either the tape is bad, or your VCR equipment has a problem. First check the VCR. One of the most common problems is that the recording heads are dirty. Also be sure that you have the right kind of connecting cable, and that the cable is not loose. If you determine that you have no technical problems, it probably is the tape. Recover the data on the cassette and discard the tape.

A Hard Error means that a data block could not be recovered at all-- this usually means that the tape is bad and should be discarded. If a Hard Error should occur in the table of contents, nothing on the tape can be recovered. If the hard error did not occur in the table of contents, recover what files you can and discard the tape. As with a soft error, check your VCR equipment for problems before discarding the tape.

9. If all four totals are zero, either the tape is completely bad, or the VCR unit is not connected to the system properly.

NOTE: You should write these totals on the outside of the cassette, to give you an evolving picture of how the tape is wearing. A high proportion of CRC errors compared to the number of copies indicate that hard errors might occur unless the number of copies is increased the next time the cassette is used.

10. If all of the files listed in the tape directory file were recorded (that is, the tape did not run out before the SAVE was completed), you will see the message:

Certification is complete.

If you do not see this message, it means that the tape ran out before all of your files were transferred. You will probably want to back up again, using a longer tape or copying less files per tape.

The system then prompts you to rewind the cassette. Remove the cassette and return it to its storage location.

7.5 HOW TO USE THE /FILE SWITCH TO CHECK A CASSETTE

(/FILE Switch)

The /FILE switch performs exactly the same function as the /CHECK switch except that it sends the status display to a file named VCRSTS.LST instead of to your terminal display. (The VCRSTS.LST file is created in the account and disk you are logged into.)

Checking a video cassette is a time consuming process, so you may want to use the FORCE command to force another job to run the CRT610 program so you can use your own terminal to run other programs. (Of course, you can only use FORCE if your system has at least one job other than your own.)

To force another job to run CRT610, you will use the ATTACH, FORCE, LOG and MEMORY commands. See the reference sheets for these commands in the AMOS/L System Commands Reference Manual, DSS-10004-00.

The paragraphs below discuss the steps in the procedure of forcing another job to run CRT610. If you will often force another job to run CRT610, you may want to ask the System Operator to modify the system initialization command file so that steps #1-4 are done automatically at the time of system bootup, so that all you need do is perform Step #5.

1. Make sure that a job other than your own is available for use. (Don't use any jobs that are being used to control printer spoolers.) If there is no extra job, ask the System Operator to create one.
2. Although the job that runs CRT610 does not need to be attached to a "real" terminal (e.g., an actual CRT or printer terminal), in order to use the FORCE command, the job does need to be attached at least to a pseudo terminal. (A pseudo terminal simulates an actual terminal. You probably already

have at least one pseudo terminal defined on your system if your system uses a printer spooler.)

A pseudo terminal is one which is defined as using the PSEUDO interface driver. Use the ATTACH command to attach the job to the pseudo terminal. For example, if the job is named EXTRA, and the pseudo terminal is named NULL:

._ATTACH NULL,EXTRA (RET)

3. Now you need to give the job some memory, using the MEMORY command. For information on using this command, refer to the AMOS/L System Commands Reference Manual, DSS-10004-00. For example:

._FORCE EXTRA MEMORY 6K (RET)

You should allocate at least 6K bytes of memory to the job.

4. Now that the job is attached to a terminal and has memory, you need to log the job into a disk account. Choose the disk account in which you want the VCRSTS.LST file to be created. Use the FORCE command to log the job in. For example, to log the job into DSK2:[100,1]:

._FORCE EXTRA LOG DSK2:[100,1] (RET)

5. Now you are ready to force the job to run CRT610. Enter:

._FORCE EXTRA CRT610/FILE (RET)

where EXTRA is the name of the job.

6. Once the job has been forced, you can then start your VCR by pressing PLAY. If you press PLAY before the job has been forced, you may miss some of the tape, and any part of the tape that runs before CRT610 begins will not be checked. You may also get some hard or soft errors reported.

When you use the /FILE switch, the statistics are updated periodically as they are when you use the /CHECK switch. You can use the TYPE command to display the contents of the VCRSTS.LST file at any time.

For example, if the job is logged into DSK2:[100,1], you can look at the VCRSTS.LST file at any time by entering:

._TYPE DSK2:VCRSTS.LST[100,1] (RET)

The entire sequence of commands would look like this:

```
.ATTACH NULL,EXTRA (RET)
.FORCE MEMORY 6K (RET)
.FORCE EXTRA LOG DSK2:[100,1] (RET)
.FORCE EXTRA CRT610/FILE (RET)
```

```
.TYPE DSK2:VCRSTS[100,1] (RET)
```

```
Total Blocks Read - nnnn
Total Copies Read - nnnn
Total CRC Errors - nnnn
Total Hard Errors - nnnn
Reliability Ratio - nnn:1
```

```
Certification is complete
```

```
=
```

You may also run the /FILE option without forcing the CRT610 command to another job, if you do not need your terminal while the certification is running.

Remember that the /FILE switch will cause any existing VCRSTS.LST file to be overwritten. Be careful not to have any valuable data in a file named VCRSTS.LST in the account under which you run CRT610/FILE.

CHAPTER 8

THE WARM BOOT

A warm boot monitor is an abbreviated version of your system monitor that contains just enough information to get your system up and running in one memory partition and with one terminal when your System Disk has been accidentally erased or written over.

It was designed specifically for the use of systems that contain only Winchester disks - such systems must be able to boot from something other than a disk in case something happens to one of the Winchester disks. If you have only Winchester disks on your system, a warm boot tape is a necessity.

Of course, a warm boot is not needed for AM-1000 systems that contain floppy disk drives, or for systems that contain disks running under the control of the AM-500, AM-210, or AM-410, since such systems contain disks that have removable media that can be replaced with a new System Disk.

After you have performed a warm boot, you can restore other files to your system from backup tapes, and perform a normal boot to restore your entire system to its former configuration.

This chapter discusses how to create, test, and save the warm boot monitor. We also talk about how to determine what files to load into the warm boot monitor you create, and how to use the warm boot monitor to perform an actual disk recovery.

8.1 CREATING THE WARM BOOT MONITOR FILE (WRMGEN)

You will use the WRMGEN program to create the warm boot system monitor file on the disk. Then you will use CRT610 or VCRSAV to copy this monitor file onto a video cassette tape.

Before you run WRMGEN, you should run the DEVTBL and BITMAP programs at AMOS command level. Simply enter the command name and press the

RETURN key. Then make a note of the devices on your system, and whether they are sharable or not (DEVTBL displays this), and the BITMAP size for your system. You will need this information when you use WRMGEN.

Then, at AMOS command level, enter:

```
_WRMGEN {Filename} RET
```

where Filename is an optional name for your warm boot monitor file. The Filename default is AMOSL.WRM.

WRMGEN then asks you for each piece of information it requires to build the monitor file. When it is finished, WRMGEN displays a message telling you how large the warm boot monitor file is.

Each statement you are about to see requires a response that has default values built in. You may enter the complete specification for each response, if you wish; but more likely than not, your system is set up so that you can take advantage of many of these defaults. The defaults are listed after each statement. Press RETURN after each response:

- a. Input monitor: Filespec
where the Filespec of your system monitor must be specified. You must enter at least the file name, such as AMOSL. The rest of the filespec defaults to DSKO:filename.MON[1,4].
- b. System disk driver: Filespec
where Filespec identifies the disk driver of your system. You must enter at least the file name, such as PLD or PMD. The rest of the filespec defaults to DSKO:Filename.DVR[1,6]. It MUST be a 3-character name, and cannot be "DSK".
- c. Number of logical devices: Number
where Number is the number of logical devices your system has. You will only see this question if you have a self-configuring disk.
- d. Bitmap size: Number
where Number is the size of the bitmap on your system. You will only see this question if you have a self-configuring disk.
- e. System terminal interface driver: Filespec
Enter at least the filename of your system terminal interface driver, such as AM100L. The rest of the filespec defaults to DSKO:filename.IDV[1,6].

- f. System terminal interface port number: n
 where n is the port number of the system terminal interface for the terminal you will be using to boot up. The default value is 0 (zero).
- g. System terminal interface baud rate: n...n
 where n...n is the baud rate of your system terminal interface. You must enter the baud rate, such as 9600. These baud rates are documented in the AMOS/L System Operator's Guide, DSS-10002-00. The default is the maximum baud rate of 19200.
- h. System terminal driver: Filespec
 Enter at least the file name of your system terminal driver, such as SOROC. The rest of the filespec will default to DSK0:filename.TDV[1,6].

After you have entered this basic information, you will see a message asking you to enter the names of Secondary Devices to be defined into system memory (if you have self-configuring secondary devices, you will see the Number of logical devices: and Bitmap size: questions for those devices). You must enter the device name, one device name per line (for example, MINO). Notice that there is no colon after MINO - in this case, it should be written without the colon. Enter a blank line and press the RETURN key to end this device specification.

The DEVTBL command can tell you what devices are defined on your system. If a device is nonsharable, put a slash, /, in front of the device name (1/4" streaming tape drives, video tape recorders, and some printers are nonsharable devices). Bitmaps, etc., are automatically set up as needed.

This only DEFINES the devices into system memory; it does not load the actual device driver programs (such as VCR.DVR). You must do that when WRMGEN asks you to list the programs you want preloaded into system memory.

This is the next step. Enter only one program name at a time. To terminate loading, enter a blank line. The programs to be preloaded into SYSTEM MEMORY should be only those programs that are both necessary and needed for the entire boot procedure. Once in the SYSTEM MEMORY, these programs cannot be deleted during the boot. For Example:

Program to load: VCR.DVR[1,6] (RET)
Program to load: VCRRES (RET)
Program to load: CMDLIN.SYS (RET)
Program to load: SCNWLD.SYS (RET)
Program to load: (RET)

You may enter only the program name, if you wish. The rest of the program specification defaults to DSK0:filename.LIT[1,4].

IMPORTANT NOTE: If you have a self-configuring disk (such as an AM-515), you must enter the micro-code file (such as AM515.MIC) along with the driver program. If the micro-code file is not in system memory, the disk will not function. This applies to any device that has an accompanying micro-code file.

Now you will be asked to enter the names of the programs to be preloaded into the USER PARTITION. As before, enter only one program name at a time, and enter a blank line to stop. The same defaults apply.

The programs preloaded into the USER PARTITION should be programs that are necessary to the warm boot, but that can be deleted after they have been run. Programs that can be deleted can make room in memory for other needed programs, since you will only have one memory partition to work with. See the example above for the format.

Since there are so many types of systems, and so many ways to configure systems, it is not possible for us to tell you what to put into your own warm boot monitor. Exactly how you build your warm boot monitor, and the number of programs that you load into your system memory and user partition, will depend on your own system.

Here is a sample of what an entire sequence of commands might be:

Warm boot monitor generator - VXX.X

Input monitor: AMOSL (RET)

System disk driver: PLD.DVR (RET)

Number of logical units: 8 (RET)

Bitmap size: 3889 (RET)

System terminal interface driver: AM100L (RET)

System terminal interface port number: 0 (RET)

System terminal interface baud rate: 19200 (RET)

System terminal driver: SOROC (RET)

Enter name of SECONDARY DEVICE(S) to be defined into system,
one per line. Enter blank line to terminate loading.

Device to define: DSK1 (RET)

Device to define: /VCRO (RET)

Device to define: (RET)

Enter name of program(s) to be preloaded into SYSTEM MEMORY,
one per line. Enter blank line to terminate loading.

Program to load: VCR.DVR[1,6] (RET)

Program to load: VCRRES (RET)

```

Program to Load: SYMSG.USA (RET)
Program to Load: SCNWLD.SYS (RET)
Program to Load: CMDLIN.SYS (RET)
Program to Load: 515DVR.DVR[1,6] (RET)
Program to Load: AM515.MIC[1,6] (RET)
Program to Load: (RET)

```

Enter name of program(s) to be preloaded into USER PARTITION,
one per line. Enter blank line to terminate loading.

```

Program to Load: SYSACT (RET)
Program to Load: CRT420 (RET)
Program to Load: BADBLK (RET)
Program to Load: (RET)

```

* * Warm boot generation complete. Warm boot monitor is xx bytes * *

8.2 TESTING THE WARM BOOT MONITOR

Now you have a warm boot monitor file on the disk. Before you transfer it to the video cassette tape, you should test it to make sure that it works as you would like it to. You do not want to wait for an emergency to see if your warm boot tape works! The program you use to test a warm boot monitor is called MONTST.

You must log into the System Operators account to run MONTST. Then enter the MONTST command, specifying the name of your warm boot monitor. For example:

```

.LOG OPR: (RET)
Logged into OPR:
.MONTST AMOSL.WRM[1,4] (RET)

```

NOTE: Enter the MONTST command exactly as shown above. Do NOT enter the name of a system initialization command file. Warn any other users on your system before running MONTST.

After booting successfully, you will see:

```

AMOS/L          Version xx.x
_

```

Now you are ready to try some of the commands included in the warm boot monitor (the non-destructive ones). Remember that for a true test you can only use the commands you loaded into the monitor. If the warm boot monitor doesn't work correctly, just push the RESET button to boot from the System Disk and try building a new warm boot monitor.

8.3 TRANSFERRING THE WARM BOOT MONITOR TO THE VCR (CRT610/BOOT)

Now that your warm boot monitor file is finished and tested, you can transfer it to a video cassette tape.

Both the VCRSAV command and the CRT610 command have a /BOOT switch that enables you to copy a warm boot monitor file to a video cassette. If you wish to copy other files onto the same cassette at the same time, you can use the VCRSAV command which is explained in Chapter 4. Otherwise, you can use the /BOOT switch with the CRT610 command, as shown in the following example. The other functions of CRT610 were explained in the last chapter.

1. Load a blank video cassette into your VCR unit.
2. Type CRT610 followed by the optional file specification of the warm boot monitor. Then press the RETURN key.

```
_CRT610 WARMB.00T (RET)
```

NOTE: Since /BOOT is the default switch if you specify a filename, we didn't add the /B here. If you do not specify a filename, you must add the /B. For example:

```
_CRT610/B (RET)
```

If you enter a filespec, the default device and account are DSK0:[1,4]. If you don't, CRT610 first tries DSK0:AMOSL.WRM[1,4]. If it doesn't find it there, it looks for AMOSL.WRM in the device and account you are logged into.

3. Now CRT610 acknowledges your request by displaying:

```
BOOT  
Creating Boot Cassette
```

And it asks you for more information for the cassette label.

- a. Volume Name:
Enter a textual description of the tape. It can be up to forty characters long.
- b. Volume Id:
Type any name you wish to give this tape as long as it is no more than ten characters.
- c. Installation:
Enter the name of your company. Maximum length is thirty characters.

d. System:

Enter the name of the computer system this tape is created on. This thirty character field is useful if your installation has more than one computer system.

e. Creator:

Enter the name of the person creating the tape. This field may be up to thirty characters long.

4. If you have a VIDEOTRAX Video Tape Recorder, you will now see messages as CRT610 creates the warm boot tape. If you have a standard VCR, CRT610 then tells you to:

Place cassette at load point.
Press RETURN on CRT when ready.

That is, make sure the cassette is completely rewound to the beginning of the tape, and is ready to record.

5. When CRT610 is ready to transfer the monitor file, it displays:

Press Record on VCR.
Press RETURN on CRT when ready.

CRT610 waits about ten seconds and then begins transferring the warm boot monitor file from disk to tape.

6. The last message you see is this:

The transfer is now complete.
Press STOP on the VCR.

7. Rewind the cassette. You should now use CRT610 with the /CHECK switch to make sure that the data on the tape is good. When you are finished, remove the cassette, label its container, and return it to its storage location.

IMPORTANT NOTE: If you change the configuration of your system, you may need to create a new warm boot cassette.

8.4 WARM BOOTING FROM THE VIDEO CASSETTE RECORDER

If everything is fine, try booting for real: load the tape containing the warm boot monitor into the VCR, push the PLAY button, and push the RESET button on the computer front panel.

Since you already know that your warm boot monitor works fine, this test just tries out the rest of the system - the tape itself, the VCR, the AM-610 and AM-610 cables (or the AM-1000).

The above is the procedure you will use if you ever have a problem booting normally. Once you are successfully booted, you will see:

AMOS/L Version xx.x

⋮

Then press STOP on the VCR, rewind the warm boot tape, and return it to its storage case. If you have data files stored on the same cassette as the warm boot monitor, you can leave the tape in the VCR and use the VCRRES command to restore those files.

8.5 HINTS ON BUILDING AND USING WARM BOOT MONITORS

This section contains some hints on determining what files to include in a warm boot monitor, and gives some procedures for recovering from disk problems once you have booted up under a warm boot monitor.

Of course, we hope that you never have a hardware, software, or user problem that forces you to rebuild your System Disk, but it is good practice to prepare for problems ahead of time, just in case.

The guidelines below are only suggestions - you know your system best, and you are in the best position to decide what to include. Look in account DSK0:[1,4] to see what programs might be most useful if you were suddenly unable to load anything in off of DSK0:. You might want to try out several different warm boot cassettes before an error actually occurs. That way you can be sure that each warm boot monitor really does what you expect it to do.

You will want to prepare several different warm boot cassettes, each aimed at a specific problem. For example, one warm boot monitor might be aimed at a total disaster situation where nothing is retrievable off the disk, while another might be aimed at a situation where the file structure of the disk is fine, but the system initialization command file has accidentally been erased. Make sure you label each cassette with the programs that it contains. The next sections discuss some of the possible types of warm boot monitors.

First, some general guidelines:

1. If you are going to use VCRRES to restore files to the disk, your warm boot monitor MUST contain SCNWLD.SYS and VCRRES.LIT in user or system memory. It is a good idea to have the file SYMSG.USA on your warm boot tape so that you can understand error messages printed on the terminal.

2. The warm boot monitor automatically logs the operator into account DSK0:[1,2]. Therefore, you don't need to load LOG into your warm boot monitor, because from account [1,2] you can write to any disk account.
3. Be careful about adding too many programs to the warm boot monitor - you need to have enough memory once booted to run the programs or you will not be able to perform the recovery procedures you have chosen. When in doubt, create another warm boot monitor to perform extra functions.
4. In addition to making different warm boot cassettes, you will probably want to make several copies of each type of warm boot cassette; this ensures that you always have at least one good copy.

In all of the examples that follow, we assume a hypothetical system that has two Winchester disk drives that contain two logical devices each. For your own system, of course, you will need to use the appropriate programs instead of the specific examples given below.

Each one of the sections below define a specific problem for which you should create a warm boot monitor. We discuss what should go into the warm boot monitor, and how to use that monitor when the need arises.

8.5.1 Reinitializing the Disks

Suppose a situation occurs when, through a software or hardware error (or even through a user's mistake), most or all of the data is destroyed on your disks.

There are two possible ways to recover from this situation: if you have a resident wizard, he or she can try to use a warm boot monitor containing DSKDDT to repair the disks. However, this requires a thorough understanding of the Alpha Micro disk structure, is a very complex procedure, and is a lot of work. We don't recommend it. Or, you can use a warm boot monitor that contains SYSACT and you can re-initialize the disks and start over.

Remember that every program you need must be in the warm boot monitor, since nothing is available from the disk.

■ NOTE: The driver you specified to WRMGEM as the System Device driver must have previously been configured to handle the proper number of logical devices per physical unit (in our example, two). And, don't forget to define the DSK devices other than DSK0: as secondary devices if you need to use them initially.

When you run the WRMGEN program, load the following programs into system memory:

```
VCR.DVR
SCNWLD.SYS
CMDLIN.SYS
```

VCR.DVR is the driver for the AM-610 and the AM-1000 Video Cassette Recorder Interfaces, and must be in memory if you are to access that device. SCNWLD.SYS and CMDLIN.SYS are wild card specification handlers - SCNWLD.SYS is required by the VCR software. You may want to load SYSMSG.USA, also.

Load the following programs into user memory:

```
MOUNT
SYSACT
VCRRES
```

MOUNT is used to access the logical devices on the physical units. SYSACT is used to initialize all logical devices on the two physical units.

VCRRES will be used to restore the data from a cassette to the newly prepared disks. You may also want to include one or more of the following programs in user memory:

```
VCRDIR
SET
DEL
```

VCRDIR can be used to determine the contents of the tapes you want to restore from, SET can be used to determine that the parameters of your system are correct, and DEL can be used to delete programs from memory (making room for other programs to run).

CAUTION: The procedure below clears all of the files on all of the DSK devices. Make sure that you have multiple tape backups, and that you have tested your warm boot monitors.

Let us say that you now have booted up with the monitor defined above. The procedure below is just one possible use of the warm boot monitor to re-create a system with two Winchester disks each of which contain two logical devices:

```
._DEL SET.LIT (RET)
._DEL VCRDIR.LIT (RET)
```

After this is done, do the following to restore your data:

```

.SYSACT DSK0: (RET)
*I (RET)
Initializing the disk clears all files - enter Y to continue: Y
Reserve space for how many accounts?
*E (RET)
.DSKANA DSK0: (RET)
.MOUNT DSK1: (RET)
.SYSACT DSK1: (RET)
*I (RET)
Initializing the disk clears all files - enter Y to continue: Y
Reserve space for how many accounts?
*E (RET)
.DSKANA DSK1: (RET)
.MOUNT DSK2: (RET)
.SYSACT DSK2: (RET)
*I (RET)
Initializing the disk clears all files - enter Y to continue: Y
Reserve space for how many accounts?
*E (RET)
.DSKANA DSK2: (RET)
.MOUNT DSK3: (RET)
.SYSACT DSK3: (RET)
*I (RET)
Initializing the disk clears all files - enter Y to continue: Y
Reserve space for how many accounts?
*E (RET)
.DSKANA DSK3: (RET)
.VCRRES ALL:[] = ALL:*. *[] (RET)

```

Now your system is fully restored. For information on SYSACT and MOUNT, see the AMOS/L System Commands Reference Manual, DSS-10004-00.

8.5.2 Recovering Individual Files

A situation can arise in which the monitor or system initialization command files are lost or destroyed. Although the contents of the rest of the disk may be valid, you cannot boot because these special files are gone.

You can usually assume that all the files except the monitor and system initialization comand file are still available. However, it is safest to pre-load, with the warm boot monitor, the programs you will need if any specific files are not available.

Load the following programs into system memory:

```

VCR.DVR
SCNWLD.SYS
CMDLIN.SYS

```

VCR.DVR is the device driver for the AM-1000 and AM-610 Video Cassette Recorder Interfaces, and is needed to access those devices. CMDLIN.SYS and SCNWLD.SYS are wild card file specification handlers - SCNWLD.SYS is needed by the VCR software.

Load the following programs into user memory:

```
MOUNT.LIT
VCRRES.LIT
PPN.LIT
DIR.LIT
LOG.LIT
```

MOUNT is required to access the logical devices on a physical unit. VCRRES is needed to restore the missing files from a backup cassette. PPN is needed to verify that the proper accounts still exist on the disk. DIR is used to see which files are missing or, by using the /H option, to see which files have been corrupted.

You may also want to include VCRDIR, SYSMSG.USA, and/or SET. VCRDIR can be used to look at the contents of your backup tapes, and SET can be used to determine that your system parameters are correct.

To restore your monitor and system initialization command files, do the following:

```
._PPN DSKO:RET
._DIR DSKO:AMOSL.*[] RET
._VCRRES = DSKO:AMOSL.*[] RET
```

You should now be able to reboot your system and run normally.

8.5.3 Miscellaneous Situations

Use your imagination in determining what other warm boot tapes might be needed. For example, you might want to have a diagnostic warm boot tape that contains REDALL, DSKDDT, ERASE, CMDLIN.SYS, SCNWLD.SYS, and DSKANA. This tape would help you correct disk file structure problems and "bitmap kaput" errors.

Or, you might want another tape for assessing the damage on the disk that just contains DIR, SCNWLD.SYS, PPN, and TYPE. And, of course, you probably want a boot monitor that contains CRT420, in case your BADBLK.SYS file should get erased or you have hard errors that prevent you from booting from the drive.

CHAPTER 9

VCR ERROR MESSAGES

In addition to the standard AMOS/L error messages (see the AMOS User's Guide, DWM-00100-35 for those), the VCR software produces the following error messages:

?Backup media is not file structured.

The tape you are trying to read was not written by the VCRSAV program. The VCRDIR and VCRRES programs can only read tapes written by VCRSAV. Check to make sure you have loaded the correct tape cassette.

?Backup media not compatible with current software.

The tape was saved by a version of VCRSAV which is not compatible with the current version of VCRRES. Check with your System Operator to see what can be done.

%Bypassing BADBLK.SYS[1,2]

% BADBLK.SYS exists to prevent bad blocks
% on a device from being allocated, and
% should never be directly accessed.

You cannot copy the BADBLK.SYS[1,2] file, since this would lead to the corruption of the file system.

%Bypassing VCRTOC.IPF

% VCRTOC.IPF is the name of the
% Table-of-contents file from tape, and
% cannot be directly accessed.

You cannot copy a file to the disk with the resulting file name of VCRTOC.IPF because it would write over the temporary file VCRRES is using to locate files on the tape.

?Cannot OPEN Devn: - protection violation

You tried to copy into an account you are not logged into that is not in the same project as the account you are copying from, and you are not logged into [1,2]. Either log into [1,2] or the account you want to write into, and try again.

?Cannot READ Devn: - device does not exist?Cannot READ Devn: - device is not mounted

You tried to copy to or from a device that is not listed in the DEVTBL command in your system initialization command file, does not have a driver in account [1,6] of the Sytem Disk, is not file-structured, or is not mounted.

?Cannot READ Devn - device error

When VCRDIR tried to read a cassette, it found something wrong with the tape. Be sure the cassette is loaded properly, and that the the internal mechanism of the VCR unit is clean.

%Cannot restore with SET VERIFY on.%Enter Return to continue without VERIFY or CTRLC to abort:

If the number of copies you specified with the /COPIES command is less than four (or if you specified none, as default is 0), and the VERIFY option is set ON, the system cannot restore. If you type a RETURN, the SET NOVERIFY option is enabled.

?Device full

There is no more room on the disk for the list file.

?Discrepancy in file block count for <filename.ext>

This message is given if the actual number of blocks in a file does not equal the count in the table of contents. VCRSAV will write null blocks to the tape if the disk blocks are less than the table of contents indicates, or stop writing blocks when it agrees with the table of contents if the disk blocks are greater. This indicates that your disk has an error. When the VCRSAV program is done, you may want to run DSKANA to correct the file error. Also, the file transferred to the tape may be incorrect, and you may wish to run VCRSAV again after correcting the disk problem.

?Files may not be transferred to RES:

You may only add programs to system memory by using the SYSTEM command within your system initialization command file.

%Field size exceeded. Re-enter.

While you were entering the label information, you tried to put more data into a field than it could hold. Check the maximum length of the field, and try again.

?Illegal cassette size

You entered an invalid number of hours in response to the cassette size message. The only allowable values are from one to six. CRT610 terminates after displaying this message, so you'll have to start over again.

?Illegal number of copies

When you are verifying a cassette, the number of copies specified must fall within the range of from four to 255. Anything outside this range will result in this message and the termination of the program. You will have to start over.

?Missing output specification

You omitted the equal sign in the VCRRES command line; VCRRES couldn't tell which information was your input specification and which was your output specification.

?More than one output specification

You may not supply more than one output specification. Re-enter the command with only one output specification.

%No such files

VCRDIR was unable to find any files matching your input specification.

%Not selected - Destination file already exists

You tried to copy to an existing file while the /NODELETE option was in effect.

%Not selected - Destination file has same HASH as source file

You used the /HASH switch and it found matching hash totals on the cassette and the disk. The files are evidently identical so no transfer is necessary.

%Not selected - Source file does not have a calculated HASH total

You specified the /HASH switch but the cassette does not contain a HASH total to compare. You didn't use the /HASH switch when you used the VCRSAV program.

%Tape has passed specified location.

Press REWIND to back up and try again.

In a SEARCH operation, you went past the location of the file you specified. Rewind the tape and continue search.

%Tape header not found

Tape may not have been previously written to

The CRT610 program did not find a tape header label at the start of the tape. This could mean that the tape contains no files. CRT610 will continue to check the tape for errors.

%WARNING -- Extra copies count on backup media is
below the minimum level for usage of
the TRANSFER switch.

You do not have the recommended number of copies (20) of the files on your tape for a TRANSFER restore. If you continue, you may lose files. You may want to restore without using the /TRANSFER switch.

?You are not logged in under [1,2], can't create [p,pr]

You cannot copy from an account to a nonexistent account unless you are logged into the System Operator's account, [1,2]. If you copy to a nonexistent account while logged into [1,2], VCRRES will create the account for you.

AMOS/L Video Cassette Recorder Backup Software

Document History

Revision A00 - (Printed December, 1982) - New Document

Re-written from the Software Information for the AM-610 Video Cassette Recorder Interface, DSS-10000-24, in order to separate the manual into AMOS and AMOS/L versions. Diverging software caused major differences in the two systems.

Revision A01 - (Printed May, 1984)

Added new switches: /TRANSFER, /WAIT, and /SEARCH. Revised chapters 4 through 6 accordingly. Small change of tape header display to chapter 7.

Revision A02 - (Printed April, 1986)

Adapted to include the new VIDEOTRAX remote-controlled Video Tape Recorder, and to update the WRMGEN procedures.

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