

SUPPLEMENTARY OS4 UTILITIES REFERENCE MANUAL

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**This product has been developed by Computer Automation in Europe
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REVISION HISTORY

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A0	July 1980	Initial Release

ERRATA NOTICE NO. 1

SECTION 3 - ARCHIVE UTILITY

1. All references to "4k-byte blocks" should be changed to read "AU-sized blocks".
2. Two more messages have been added to the Utility.
- 2.1 The first should be read in conjunction with the "Unit Error" message described on Page 3-6.
The message and its description reads as follows:

DXnn Unit - AU :hhhh is bad: Continue or Abort?
CX>

The previously described "Unit Error" message is often followed by this message. If the bad AU is on the source device and the operator chooses to ignore it (by typing 'C' in response to the CX> prompt), the current buffer contents are written out to the destination device and will be skipped during the verification phase when the bad AU is re-encountered. If the bad AU is on the destination device it can be ignored when no data files span this AU, otherwise the operator should abort by typing 'X'.

- 2.2 The second new message should be added to the end of Section 3.4.
The message and its description reads as follows:

DXnn Unit's last AU is bad - ignored

Some 80mb disk packs have a faulty AU :404B.
This is always ignored by ARCHIVE.

SUPPLEMENTARY OS4 UTILITIES REFERENCE MANUAL

PREFACE

This manual describes a number of OS4 utility programs which can be used to reduce program development timescales.

The following Computer Automation documents provide information related to the utility programs.

OS4 System User's Manual	(90-93460-00)
OS4 Technical Bulletin	(90-93460-03)
RTX4 User's Manual	(90-93410-00)
IOS4 User's Manual	(90-93405-00)
NM4 Standard Disk File Format	(90-93440-90)
NM4 Debug Reference Manual	(90-93015-00)

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SECTION 1

BINARY LOAD & DUMP PROGRAM (BLD4)

1.1. INTRODUCTION

The process of producing a program to be loaded and executed by OS4 consists of two steps:

1. Assembly or compilation of a program's source code into intermediate code called Object Code modules.
2. Linkage of one or more Object Code modules into one Binary Coded module for subsequent loading by OS4 or an Autoload function.

The information in Object Code and Binary coded modules is contained in items called Type-Code Records.

When OS4 is instructed to load and execute a binary file, the OS4 program loader has to decode all the type-codes in the program. In order to process these type-codes, the program loader accesses the binary file through the SFM Virtual Buffer Pool. This uses processor time and requires a large number of time-consuming disk accesses.

BLD4 is an OS4 utility program which reduces the time taken to load large application or system utility programs such as EXEC, DUP, etc. BLD4 achieves this by generating a file containing a memory image of the program to be subsequently loaded by OS4. The load time of this memory image (by a bootstrap program at the front of the file) is considerably reduced as no type-code processing is required and the number of disk accesses is minimised.

1.2. OPERATION

A program is initially loaded into memory using an OS4 'file1;BLD4' command followed by the name of the file to be produced by BLD4. (see Section 1.2.2 Dump Generation).

BLD4 then dumps a memory image of the program, in blocks of up to 16k words, preceded by a bootstrap program to the user defined file on an SFM formatted disk.

When the dumped program is subsequently loaded and executed, using the OS4 'file' command, the BLD4 bootstrap is first loaded into memory as a small type-coded program at the high address of the program it will load. Control is passed to the bootstrap which then loads the absolute memory image, in up to 16k word blocks, directly into memory. The message:

BLD4 VERSION OF:-

is output to the 'OC' device and control passed to the program just loaded by the

bootstrap loader.

BLD4 is supplied as a binary program called BLD4.BIN and should normally reside on the SF disk or diskette.

1.2.1 Dump Generation

A fast-loading user program or system utility is generated by BLD4 by entering the following command line:

`<file>;BLD4 <newfile>`

where: `<file>` is the name of the program to be loaded by the OS4 loader for subsequent dumping by BLD4.

`<newfile>` is the name of the file generated by BLD4 to contain the memory image of the program called `<file>`.

BLD4 will delete `<newfile>` if it exists, create a file called `<newfile>` and return control to OS4. The user may then load the new fast-loading program contained in `<newfile>` (see Section 1.2.2 Program Loading).

1.2.2 Program Loading

A fast-loading user program or system utility may be loaded and executed on OS4 by use of the OS4 'file' command.

Enter the name of the file `<newfile>` (see Section 1.2.1 Dump Generation), to OS4 and the program will be loaded into memory and executed.

1.2.3 Restrictions

In general, the instructions for dumping and subsequently reloading programs apply equally for an OS4 or OS4/MULTED system.

However, when a program is loaded to run on an OS4 system it is loaded from location :200 upwards; and when run on an OS4/MULTED system, from the top of the Operator Control Program (OCP) which itself resides from :200. Therefore, users are advised that they may not load, on an OS4/MULTED system, a program which was dumped by BLD4 on an OS4 system, as the OCP would be overwritten.

1.3. ERROR MESSAGES

BLD4 uses the standard IOS4 I/O calls during its execution and normally relies on the standard error recovery procedure of CRX> prompts. If the user responds to these prompts with a C entry BLD4 may output, to the 'OC' device, error messages either during the program dump phase (see Section 1.3.2 below) or during the loading of a dumped program by the bootstrap loader (see Section 1.3.1 below). In both cases an E:MONE exit will be taken back to OS4 (see OS4 System Users Manual Section 6.2.3).

1.3.1 BLD4 Dump-time Error Messages.

The BLD4 dump program may output one of the three following error messages:

1) BAD OUTPUT MEDIUM

This error message is output if there is a syntax error in the parameter <newfile> or if the output device is not a disc medium.

2) OPEN FAILURE

This error message is output if BLD4 cannot open the file <newfile> (see Section 1.2.1).

3) OUTPUT TRANSFER ERROR

This error message is output if a repeated data transfer error occurs.

1.3.2 BLD4 Bootstrap Load-time Error Messages.

The load-time Bootstrap program may output one of the three following error messages.

1) BAD BOOT TRANSFER

This error message is output if the Bootstrap finds corrupt data in the dumped program file <newfile>.

2) CAN'T OPEN LUN LD

This error message is output if the user erroneously responds with C to a CRX> prompt after the Bootstrap finds a disc device off-line.

3) WRONG OS4 FOR LOAD

This error message is output if the user tries to load on an OS4/MULTED system, a program which was dumped on an OS4 system (see Section 2.3).

1.4 FUNCTIONAL COMPARISONS

There are two areas where it is advantageous to use BLD4 dumped programs. Firstly in the reduction of loading-time of programs and secondly in the reduction of the size of the file needed to contain the binary loadable program.

Note: In general, the size of the file will be reduced, however, if a program contains a large number of RES,n assembler directives, the size of the file could well increase; this should not adversely affect its loading time.

1.4.1 Timing and File Size Comparisons

Two utility programs, EXEC:: and DUP are tabulated below to illustrate their load times and file sizes, in the standard form and the BLD4 dumped versions.

<u>Program</u>	<u>Sizes(bytes)</u>		<u>Load Times(seconds)</u>			
	Standard	BLD4	Floppy Disc		80mb Disc	
			Standard	BLD4	Standard	BLD4
EXEC::	3C1B	3BD2	10.0	6.2	1.8	0.7
DUP	C25C	B51C	21.5	8.5	3.8	0.7

SECTION 2

DISK UTILITY PROGRAM (DUP)

2.1 INTRODUCTION

DUP is an interactive Disk Utility Program which combines the functions of file deletion, renaming, copying, dumping and viewing. DUP provides the facilities of selection via wild-card masks, via date ranges and via user response.

There are two versions of DUP provided for the user. The standard one, DUP.SYS, outputs lower-case characters to terminals or character devices. If the user's terminals or character devices will not output lower-case characters as upper-case the user should use DUPH.SYS.

2.2 OPERATION

DUP is loaded by typing DUP to OS4. DUP will identify itself, output the date and time and prompt for input. The first-time user is advised to type Help and Yes to the subsequent prompt. This latter action will cause DUP to enter TEACH mode. When in TEACH mode DUP will produce a detailed prompt at each stage, explaining the alternative inputs. DUP will automatically enter TEACH mode for a single response if an illegal reply is encountered.

At all points where DUP requests a keyword as input the user must type enough characters of the keyword to provide an unambiguous reply. Upper-case or lower-case letters are acceptable in all command keywords. Any further characters typed by the user will be checked for validity. At any stage of input DUP will accept the following standard replies:

- (CR) means take the default action at this point.
- !(CR) means abort the current function, return to the Function prompt.
- \$(CR) means default all the remaining replies to this function.
- =(CR) means re-prompt in a more detailed manner.

When loaded DUP will identify itself, output the date and time and request the user for input with the prompt:

Function:

The reply to the prompt is one of the following:

- View - View the directory (this is the default).
- DElete - Delete files.
- Rename - Rename files
- Help - Provide help, enter/leave TEACH mode.
- DATE - Set the date and time.
- Copy - Copy (including dump) files.
- Load - Load and execute another program.
- Quit - Return to OS4.

The prompts for each function and their alternative replies are specified in the following paragraphs under the appropriate command heading.

2.2.1 VIEW

View the directory.

This is the default function - i.e. DUP will enter the following sequence if only the RETURN key is pressed at the terminal in response to the Function: prompt.

Disk device:

The reply is a physical unit name (PUN) or logical unit name (LUN) terminated by a slash (/).
The default is UF/.

Filename patterns:

The reply is up to ten filename.ext patterns separated by commas and terminated by carriage return. Each pattern may contain the wild characters ? and *. The character ? means accept any character in this position. The character * means accept any characters for the remainder of the filename or extension.
The default is *.* (all filenames specified).

Date specifiers:

The reply is up to ten date specifications separated by commas and terminated by carriage return. Date specifications are of the form:

date1-date2	meaning modified on or between date1 and date2.
date1-	meaning modified on or after date1.
-date2	meaning modified on or before date2.
date1	meaning modified on date1.

Each date is in the format Year/Month/Day where Year, Month and Day are decimal integers.

The default is no date checking, i.e. 76/03/01-93/03/01.

Report type:

The reply is one or more keywords separated by commas and terminated by carriage return. Possible keywords are:

Namesonly,	filenames and extensions only (this is the default)
Fullist,	a full list, no extents or access or creation dates. (54 cols)
Extendedlist,	a Fullist but with extents. (64 cols)
Dates,	include access and creation dates. (Implies Fullist,+24 cols)
Widepage,	assumes 120 wide page, not 80 wide.
Maintenance,	produce a disk maintenance report, (AUs available etc.)

Log medium:

The reply is a full medium specification. If the log medium is a character device then the response is PUN/ or LUN/, the slash (/) being mandatory. If the log medium is a file then the response is PUN/filename.ext or LUN/filename.ext.
The default is OC/.

2.2.2 DELETE

Up to ten filename.ext patterns may be deleted from disk in a single request. This may be done either automatically or selectively, file by file. The default filename.ext pattern is not *.* , therefore, if all files on a disk are to be deleted, *.* must be typed in response to the filename patterns prompt.

Disk device:

The reply is a physical unit name (PUN) or logical unit name (LUN) terminated by a slash (/).
The default is UF/.

Filename patterns:

The reply is up to ten filename.ext patterns separated by commas and terminated by carriage return. Each pattern may contain the wild characters ? and *. The character ? means accept any character in this position. The character * means accept any characters for the remainder of the filename or extension.
The default is null (no filenames specified).

Date specifiers:

The reply is up to ten date specifications separated by commas and terminated by carriage return. Date specifications are of the form:

date1-date2,	meaning modified on or between date1 and date2.
date1-,	meaning modified on or after date1.
-date2,	meaning modified on or before date2.
date1,	meaning modified on date1.

Each date is in the format Year/Month/Day where Year, Month and Day are decimal integers.

The default is no date checking, i.e. 76/03/01-93/03/01.

Report type:

The reply is one or more keywords separated by commas and terminated by carriage return. Possible keywords are:

Report,	meaning produce a report of deleted files (this is the default).
Noreport,	meaning do not produce a report.
AUs,	meaning report on the AUs freed by the deletion(s).
Select,	meaning allow the user to select files to be deleted via. a yes/no response.

Log medium:

This prompt is not output if the user has used the Noreport option. The reply is a full medium specification. If the log medium is a character device then the response is PUN/ or LUN/, the slash (/) being mandatory. If the log medium is a file then the response is PUN/filename.ext or LUN/filename.ext. The default is OC/.

2.2.3 RENAME

Files may be renamed either all to a single filename pattern or to a set of patterns. If more than one destination filename.ext pattern is specified then a corresponding number of source patterns must also be specified.

Disk device:

The reply is a physical unit name (PUN) or logical unit name (LUN) terminated by a slash (/).
The default is UF/.

Source filename patterns:

The reply is up to ten filename.ext patterns separated by commas and terminated by carriage return. Each pattern may contain the wild characters ? and *. The character ? means accept any character in this position. The character * means accept any characters for the remainder of the filename or extension.
The default is null (no filenames specified).

Date specifiers:

The reply is up to ten date specifications separated by commas and terminated by carriage return. Date specifications are of the form:

date1-date2,	meaning modified on or between date1 and date2.
date1-,	meaning modified on or after date1.
-date2,	meaning modified on or before date2.
date1,	meaning modified on date1.

Each date is in the format Year/Month/Day where Year, Month and Day are decimal integers.

The default is no date checking, i.e. 76/03/01-93/03/01.

Destination filename patterns:

The reply is up to ten filename.ext patterns separated by commas and terminated by carriage return. Each pattern may contain the wild characters ? and *.

The default is *.* (all filenames specified).

If a single pattern is specified it will correspond to all source patterns, otherwise each destination pattern must correspond to a source pattern.

Each destination filename pattern is determined by substituting all wild characters in the destination pattern by their corresponding character from the name of the selected source file.

Example:

If the Source F0?T.* identified files FORT.ASM, FORT.LST and FOOT.SYS the Destination *.?CC names the destination files as

FORT.ACC, FORT.LCC and FOOT.SCC respectively.

Note that if the source definition also identified a file called FORT.LPT its destination filename would be FORT.LCC which would produce an error.

Report type:

The reply is one or more keywords separated by commas and terminated by carriage return. Possible keywords are:

Report,	meaning produce a report of renamed files (this is the default).
Noreport,	meaning do not produce a report.
Select,	meaning allow the user to select files to be renamed via. a yes/no response.

Log medium:

This prompt is not output if the user has used the Noreport option. The reply is a full medium specification. If the log medium is a character device then the response is PUN/ or LUN/, the slash (/) being mandatory. If the log medium is a file then the response is PUN/filename.ext or LUN/filename.ext. The default is OC/.

2.2.4 HELP

The HELP facility allows the user of DUP to receive a full explanation of the required response to all prompts. The inexperienced user is advised to use this mode until she/he feels that it is no longer required.

Teaching (Yes/no, any other response is taken as No.)

The reply is one of the keywords Yes or No. Any illegal response is taken as No. An explanatory message is output if the user replies Yes.

2.2.5 DATE

Sets the system date and time. Some functions, e.g. COPY, will not function unless the date is set. Either the date or time may be left alone by typing RETURN in response to the appropriate prompt.

Date:

The reply is a date in the format Year/Month/Day, where Year, Month and Day are decimal integers.
The default date is the current date.

Time:

The reply is a time in the format Hour:Minute:Second, where Hour, Minute and Second are decimal integers. Minute and Second may be omitted (with the preceding colon) and default to zero.
The default time is the current time.

2.2.6 COPY

When performing a disk-to-disk copy operation DUP normally searches the source device directory for all files which match the filename patterns supplied, copying them in the order in which they appear in the directory.

The necessary exception to this is when files are being merged together into a single output file. Quite clearly, when merging files, the order in which the filename patterns are supplied determines the order in which the files are copied. Hence wild-card specifications must be prohibited from source filename patterns if merging is requested.

An extra facility has been provided in DUP which will allow a file to be selected by its F-number if it is specified as a source filename pattern in a merge copy operation. The syntax of a filename pattern corresponding to an F-number is ##nnnn where nnnn is the hexadecimal F-number of the file concerned. The user is advised to avoid using this feature as the OS4 system makes no checks on files opened by F-number. Its principal use is in the copying of files with F-numbers 2-6, which may not be referenced via the disk file directory.

Source device:

The reply is a physical unit name (PUN) or logical unit name (LUN) terminated by a slash (/).
The default is slash (/).

Source filename patterns:

This prompt only appears if the source device is a disk device. The reply is up to ten filename.ext patterns separated by commas and terminated by carriage return. Each pattern may contain the wild characters ? and *. The character ? means accept any character in this position. The character * means accept any characters for the remainder of the filename or extension.
The default is *.* (all filenames specified).
Note that wild-card patterns may not be used when merging files.

Date specifiers:

This prompt does not appear if the source device is a character device. The reply is up to ten date specifications separated by commas and terminated by carriage return. Date specifications are of the form:

date1-date2,	meaning modified on or between date1 and date2.
date1-,	meaning modified on or after date1.
-date2,	meaning modified on or before date2.
date1,	meaning modified on date1.

Each date is in the format Year/Month/Day where Year, Month and Day are decimal integers.

The default is no date checking, ie. 76/03/01-93/03/01.

Destination device:

The reply is a physical unit name (PUN) or logical unit name (LUN) terminated by a slash (/).
The default is UF/.

Report type:

This prompt only appears if the destination device is a character device. The reply is one or more keywords separated by commas and terminated by carriage return. Possible keywords are:

Report,	meaning produce a report of copied files (this is the default).
NOreport,	meaning do not produce a report.
Ascii,	meaning produce output in ASCII.
NUmber,	meaning number ASCII lines output.
Hexadecimal,	meaning produce a hexadecimal dump of the input bytes.
Select,	meaning select files to copy via. a Yes/no response.

Note that Ascii may be included with either Number or Hexadecimal, but that a Hexadecimal dump will not be compatible with line-numbering.
The default is Report and Ascii.

Start-end sectors:

This prompt only appears if the destination device is a character device and the source device is a disk. The reply is up to ten logical sector range specifications separated by commas and terminated by carriage return. Sector range specifications are of the form:

sector1-sector2,	meaning from logical sector1 to sector2 inclusive.
sector1-,	meaning from logical sector1 to the end of the file.
-sector2,	meaning from the beginning of the file to logical sector2.
sector1,	meaning sector1 only.

A logical sector is 512 bytes and logical sectors are numbered from zero. Both sector1 and sector2 above are decimal integers.
The default is 0-end (i.e. the whole file)

Copy parameters:

This prompt only appears if the destination device is a disk device. The reply is one or more keywords separated by commas and terminated by carriage return. Possible keywords are:

REPOrt,	meaning produce a report of copied files (this is the default).
Noreport,	meaning do not produce a report.

Select, meaning select files to copy via. a Yes/no response.
Merge, meaning merge the specified input files in the order
specified into a single output file.
REPLace, meaning replace any existing file(s) with the same name
as the output file(s).

The default is Report, no Selection, no Merging and no Replacing.
Note that DUP will object to Merge if wild-card source patterns are
specified.

Destination filename patterns:

This prompt only appears if the destination device is a disk device.
If the source device is a disk and files are not to be merged then a
filename.ext pattern must be specified corresponding to each source
pattern, or a single pattern may be specified which will correspond to
all source patterns. These patterns may contain the wild characters ?
and *. If the source device is a character device or files are to be
merged then only one pattern must be specified and the wild characters
? and * may not be used.
The default is *.* (same filenames as source pattern).

Each destination filename pattern is determined by substituting all
wild characters in the destination pattern by their corresponding
character from the name of the selected source file.

Example:

If the Source F0?T.* identified files FORT.ASM, FORT.LST and
FOOT.SYS the Destination *.?CC names the destination files as
FORT.ACC, FORT.LCC and FOOT.SCC respectively.

Note that if the source definition also identified a file called
FORT.LPT its destination filename would be FORT.LCC which would
produce an error if the overwrite was not specified.

Log medium:

This prompt is not output if the user has used the Noreport option.
The reply is a full medium specification. If the log medium is a
character device then the response is PUN/ or LUN/, the slash (/)
being mandatory. If the log medium is a file then the response is
PUN/filename.ext or LUN/filename.ext.
The default is OC/.

2.2.7 LOAD

Loads another program over DUP.

Program name:

The reply is a full file specification, ie. either PUN/filename.ext or
LUN/filename.ext.
The default is SF/EXEC:::SYS.

2.2.8 QUIT

There are no prompts from function Quit. The action is simply to output "Exit" to 'OC'
and return to OS4.

SECTION 3

ARCHIVE UTILITY

3.1 INTRODUCTION

The ARCHIVE utility program enables the user to create archive copies of his entire disk, diskette or magnetic tape contents on another identical type of medium. Additionally, the contents of a High or Medium-Capacity Disk may be archived to one or more reels of Magnetic Tape.

The ARCHIVE utility takes no account of the file structure (if any) on the disk/diskette media - it copies every sector in 4k-byte blocks. The utility communicates with the media via the IOS4 device handlers incorporated in the resident OS4 and, hence, via the device tables (DIBs/CIBs). The size of a disk/diskette is derived from these tables.

When disk contents are archived to a magnetic tape the format on the tape is a series of 4k-byte blocks terminated by a single-file mark when the end of a reel is reached. The last reel of a multi-reel archive contains one extra dummy block, so that the disk's end-of-medium condition will be detected first.

When a magnetic tape is copied to another magnetic tape, ARCHIVE assumes the format to be as described in the OS4 System User's Manual, that is, a series of blocks (maximum length 4128 bytes), separated sometimes by a single file mark, the end-of medium being indicated by two successive file marks.

Each archive copy (or reel) is verified automatically against the original master version.

3.2 OPERATION

3.2.1 Execution Sequence

The general syntax of the command line required to begin executing ARCHIVE is as follows:

```
ARCHIVE [command[,command]...[,]]
```

where each 'command' defines an archive operation to be performed.

[command] is specified as:

```
pun1 TO pun2[+pun3[+pun4]]
```

where: pun1 identifies the master or original device
pun2 (and optionally pun3 and pun4) identify the destination devices
for the archive copies.
(See Section 3.2.2 for restrictions on use of pun3 and pun4).

Normally, ARCHIVE does not prompt for input, the 'commands' specify complete operations, however, if the command line contains no 'commands' at all, or if the line ends with a comma (,), ARCHIVE generates the prompt:

```
ARC..
```

to the CI unit to indicate that it has completed the commands specified (if any) and is ready to accept further command input.

Example:

```
ARCHIVE DF TO DF1+DF2,DF TO DF1
```

This command sequence produces a copy of DF unit's contents on unit DF1 and unit DF2, and then in a separate operation, a copy of DF is created on DF1.

In the above example, the operator will need to change diskettes before the second operation. ARCHIVE will, in this case request, via the OC unit, that a signal be given to continue that operation. This occurs also when the next command line is accessed from a JCL file.

During each archiving operation various messages identify the phase currently being executed, e.g. opening devices, rewinding, copying and verifying. A hexadecimal counter of the number of 4k-byte blocks transferred is maintained on the programming console's hexadecimal display.

3.2.2 Command Line Restrictions

When a magnetic tape unit is specified for 'pun1' and/or 'pun2', no 'pun3' or 'pun4' specification is allowed by ARCHIVE, i.e. only 1 copy unit specification is permitted.

3.2.3 Multi-Reel Archiving

When ARCHIVE determines that to archive the contents of a disk requires more than one reel of magnetic tape, it creates and verifies the one reel before requesting the operator to unload and replace it with a fresh reel of tape.

Note: When this 'reload' message is issued the tape transport will be rewinding in OFF-LINE mode, therefore the operator must put the transport ON-LINE again when the new reel is loaded.

3.2.4 Recognised Devices

ARCHIVE recognises the following device names:

- DP - Mini-Flexible Disk
- DF - Std. Floppy Disk
- DQ - Quad Floppy Disk
- DM - Medium Capacity Disk
- DH - High Capacity Disk
- MT - Magnetic Tape

3.3 ERROR HANDLING

If an error occurs during ARCHIVE's operation an error message is output to the OC unit. After displaying the message ARCHIVE either outputs the prompt

CRX>

or takes action as described in the appropriate error message description. (See Section 3.3.2).

When the CRX> is displayed the operator should respond by typing one of the following letters:

C - This causes ARCHIVE either to mark the device causing the error as unusable and to continue archiving to the remaining copy units,
or, if the error was detected on the master unit or if the wrong magnetic tape reel was loaded, to abort its operation.

R - This enables the failing function to be re-tried

X - Aborts ARCHIVE

3.3.1 Error/Warning Messages requiring Operator Action

All the messages in this Section are followed by the prompt CRX> and require some action by the operator before continuing or aborting.

XXnn Unit Write-Protected

The PUN 'XXnn' is Write-Protected. In case this is an oversight, and not incorrect ordering of the command's PUN parameters, ARCHIVE outputs CRX> to enable the operator to resume archiving when the Write-Protect condition is cleared or to abort as appropriate.

XXnn Unit Not Ready

ARCHIVE outputs CRX> to allow the operator to Ready the unit or abort as appropriate.

XXnn Time-Out

ARCHIVE outputs CRX> to allow the operator to control the subsequent action.

MTnn Unit does not contain Archive of this Disk Type

The header block of the loaded reel contains a flag identifying the source disk as being a Medium or High-Capacity Disk type. The disk specified in the command line does not match the reel header.

ARCHIVE outputs CRX> to enable the operator to reload the correct reel and Retry the checking operation, or to abort.

MTnn Unit contains Out-of-Sequence Reel

ARCHIVE outputs CRX> to enable the correct sequence reel to be loaded for a subsequent Retry attempt, or to abort as appropriate.

3.3.2 Fatal Error Messages

All the messages in this section are output by ARCHIVE on detecting an irrecoverable error. Unless otherwise indicated, the current command is terminated and ARCHIVE will continue with the next command (either from the command line or in response to the operator) or return to OS4 if it was the last command.

Command Line Error

ARCHIVE cannot interpret the given command line.

Device unknown to this OS4 configuration

ARCHIVE indicates which parameter in the command line is unknown.

Device cannot support archive operations

A device, known to OS4 (e.g. PP) cannot support archive operations. ARCHIVE indicates the parameter in error.

Filenames not allowed

ARCHIVE indicates the parameter in error.

Illegal Device-Type combination

ARCHIVE indicates the parameter in error.

Duplicate Device specified

The same unit number has appeared twice in the current command. ARCHIVE points to the second occurrence.

XXnn Unit cannot be connected to LUN Zn

An F:CONN call was unable to connect the XXnn PUN to the Zn LUN.

XXnn Unit Error - IOS Status = :hhhh; Areg = :hhhh; Qreg = :hhhh

A call to I:IO on behalf of PUN 'XXnn' resulted in an error which ARCHIVE was unable to resolve.

The IO status (returned by IOS4) is output together with the contents of the A- and Q-registers, which usually contain the hardware status returned by the device controller/drive. ARCHIVE then proceeds in the manner described for a CRX> response of "C", unless the error occurred whilst attempting to OPEN the device, in which case ARCHIVE terminates the current command.

Note: The IOS4 status word format is described in the IOS4 Reference Manual (Appendix B) and IOS.MAC Macro file. The H/W status words are described in the appropriate device manuals.

XXnn Unit Verify Error

The data read from the XXnn PUN does not match the same data block on the master device. ARCHIVE proceeds as if "C" were typed in response to CRX>.

MTnn Unit Unexpected FM or EOT

An out-of-place filemark or unexpected End-of-Tape condition has been read/detected.

MTnn Unit Filemark not read

ARCHIVE expected to encounter a Filemark during the Verify phase.

DXnn Unit End-of-Medium not detected

A Medium or High-Capacity Disk EOM was expected.

MTnn Unit contains bad tape - Retry count exhausted

In addition to the MT handler's attempts (5) to write a block, ARCHIVE has attempted to erase the bad patch and write the block again (10 times).

Archive ABORTED!

An error occurred, for which ARCHIVE produced an appropriate error message, then the above message is output before ARCHIVE terminates the command.

3.4 NON-ERROR MESSAGES

All messages in this Section are for information only. Most require no action to be taken by the operator.

Opening Devices...

General initialisation phase message.

Rewinding in progress...

A Magnetic Tape rewind is in progress.

Copying in progress...

Copy phase message.

, Verifying in progress...

Verify phase message.

Verify completed

A verify phase has completed successfully.

XXnn Unit End-of-Medium

An advisory message only - ARCHIVE continues normally.

MTnn Unit End-of-Tape (logical or physical)

ARCHIVE has recognised that the logical or physical end of tape has been encountered - advisory message only.

MTnn Unit - Load Next Reel and Type "C" when ready

One reel has been copied to and verified. It is now rewinding in off-line mode. Follow directions given. (see Section 3.2.3)

Please type C when you are ready to continue Archiving
Next operation: <next command from command line>

At this point one ARCHIVE operation has been successfully completed and, before the next takes place, the operator must change disks/diskettes/magnetic tape reels according to the <next command> displayed with the message above.

