DPM50,DPM23 DIS DIAG MON AH-F406C-MC MAR 1982
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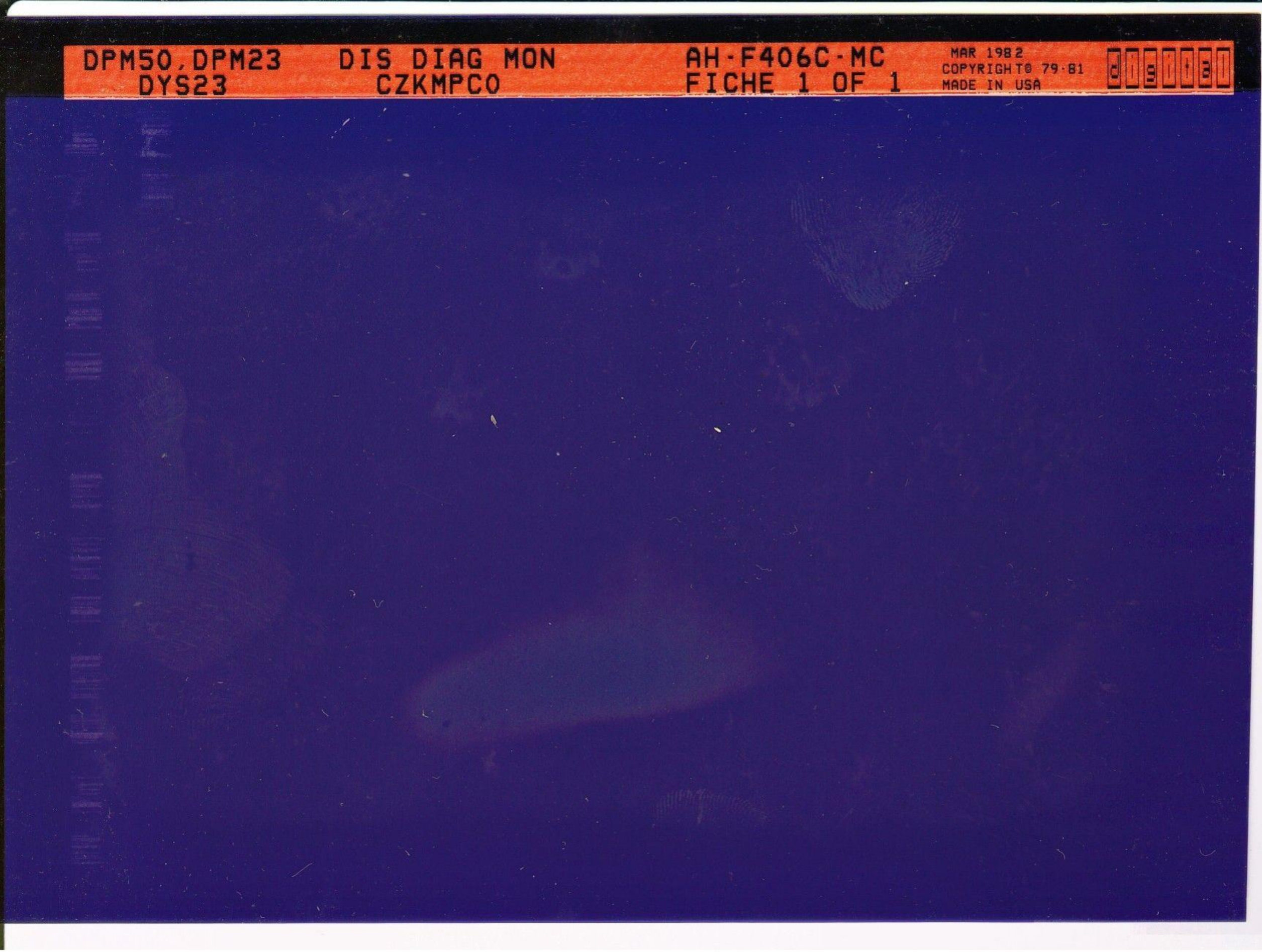

IDENTIFICATION

PRODUCT CODE: AC-F405C-MC

PRODUCT NAME: C/KMPCC DIS DIAGNOSTIC MONITOR

DATE: JANUARY 8, 1979

REVISED: APRIL 1980

SEPTEMBER 1981

MAINTAINER: ISSA AZAR - MDC DIAGNOSTIC GROUP

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REVISED BY: PATRICK N. MCKEE

REVISION HISTORY: APRIL 1980
UPDATED TO DESCRIBE COMMUNICATIONS MODE,
ROM IDENTIFICATION OPTION AND APPENDIX A
WHICH COVERS DIS OPTIONS WITH THE NAMES OF
THE RESPECTIVE DIAGNOSTICS.

SEPTEMBER 1981
CHANGED OPERATOR DIALOGUE TO CORRESPOND WITH
VAX/VMS CONVENTIONS REFERENCING THE DECDATAWAY.
FIXED MEMORY SIZING IN REMOTE BUG. REWROTE
THE SECTION MAPPING THE SYSGENED SB:C TO ALLOW
THE MANAGER ON VAX TO ALLOCATE BROADCAST CHANNELS.

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1.0 ABSTRACT

The purpose of the Diagnostic Monitor is the selection and control of Distributive Intelligent Subsystem (DIS) diagnostics through a host system task. These diagnostics are down-line loaded through an ISB11/ISV11 to an LSI11 or KDF11, run in a stand-alone environment and monitored by the host task in a real-time environment.

The tasks will provide utilities to allow a Field Service Engineer to perform first level diagnosis from the host system, or at a remote subsystem, to call and execute stand-alone type diagnostics utilizing the complete RSX11M/Dataway hardware.

Additionally, the tasks will allow an operator to perform limited modifications to diagnostic "image" files.

2.0 REQUIREMENTS

2.1 ENVIRONMENT - HARDWARE REQUIREMENTS

RSX-11M or VAX/VMS System
DECdataway
DIS
96K

2.2 ENVIRONMENT - SOFTWARE REQUIREMENTS

2.2.1 RSX-11M or VAX/VMS Operating System

The following macros are required:

2.2.1.1 FCS

FSRSZ$, FINIT$, FDBDF$, FDAT$A, FDOP$A,
FDRC$A, FDBF$A, NMBLK$, OPEN$R, OPEN$W,
CLOSE$, GET$, PUT$

2.2.1.2 CSI

CSI$, CSI$1, CSI$2

2.2.1.3 OTHERS

ALUN$, ALUN$S, GLUN$, DIR$, ASTX$S, EXIT$S,
CMKT$S, MRKT$S, WTSE$S, WAIT$, QIO$, QIOW$

2.2.2 MDC Software Package

3.0 TEST FUNCTIONAL DESCRIPTION

Primary DIS testing, diagnosing and verifying will be performed by the Diagnostic Monitor utilizing a series of diagnostic "image" files on the system disk. The facility to update the current "image" files will be provided in the Diagrostic Monitor.

The Diagnostic Monitor and 8080 monitor will provide the operator with the ability to call and execute stand-alone diagnostics in the remote subsystem under test with calling facilities and error reporting at either a local terminal or the host system console.

3.1 DIS DIAGNOSTIC MONITOR

This program/procedure will consist of three basic pieces which are:

a) an RSX-11M non-privileged task with limited "user-mode diagnostic" features (i.e., in respect to the ISB11 driver only).
b) a small down-line loadable 8080 based monitor to facilitate communications between the F.S. maintenance console and the host.
c) a set of files on the customer's disk, each of which represents one stand-alone KDF11/LSI11/IP300 diagnostic task in image format.

The image files described in "c" above will be initially provided on the same distribution media as the Diagnostic Monitor and will be capable of being updated via patching facilities built into the Diagnostic Monitor in communication or host mode. Operation of this DIS monitor is in essentially three modes, one of which is selected immediately after the operator "calls" the DIS Diagnostic Monitor (i.e., > RUN CZKMPC). The three modes of the task are:

a) LOCAL MODE
b) HOST MODE
c) COMMUNICATION MODE

In this and all subsequent references "LOCAL" infers diagnostic procedures initiated and controlled at the KDF11/LSI11/IP300 subsystem level and "HOST" infers operator control exclusively from a host RSX-11M system.

3.1.2 Local Mode

Conceptually, this process consists of three levels of abstraction utilizing the system QIO calls and the MDC software commands as the threads of communication interlinking the RSX-11M host task, the 8080 diagnostic monitor and the LSI11 based stand-alone diagnostic.

3.1.3 Host Mode

The purpose of this type of test is to verify the operation of individual components on the remote DIS from the host system. The diagnostic process is quite similar to the APT "quick verify" process which, although it is expected to find most faults, it is not and cannot be expected to be as comprehensive a testing process as that conducted in "local" mode. It does provide, however, an efficient method for Field Service to verify basic functionality of the remote subsystems.

The process, which can be initiated in several ways, always utilizes the testing methodology analogous to the Automated Process Testing (APT) used in various mfg. plants. It follows then that for a diagnostic to be usable, it must be fully APT-compatible with hooks for controlling the test and reporting end of pass and errors. It is anticipated that the "up-line load" command will be utilized for reporting and the "down-line load" command for test initiation, termination and control.

3.1.4 Communication Mode

This mode acts much the same as the Host mode, however, when running DIS tests on I/O modules, using the diagnostic CVPCAx, a map of the DIS I/O modules is uploaded to the Host terminal on the first pass and a full error report is made enabling the F.S. personnel to know at which address the error occured, on what type of I/O board and what type of error occured.

4.0 STARTING PROCEDURE

RUN CZKMPC

This instruction will start the Diagnostic Monitor.

5.0 OPERATING PROCEDURE

5.1 INITIALIZATION

CZKMPC VERSION 1.0

At the beginning of the task, the current version number of the task will be printed as shown above.

SELECT MODE: LOCAL, HOST, COMMUNICATION OR EXIT (L,H,C,E)

The mode query enables to user to select which mode of operation is to be used or to exit the task. Host mode will continually return the user to this mode query for additional input and it must be used as the exit medium. Local mode will terminate the task normally when the user specifies from the remote subsystem. Communication mode is like Host mode but it uploads more information. Host mode can serve as a quick verify.

All input values are specified in brackets as below.

ENTER NUMBER OF NODFS [D] =

Enter the total number of nodes to be specified as input. ihis number will be compared against the number of nodes specified later and will generate an error if they are not equal. As indicated, this is a decimal number.

ENTER CONTROLLER NUMBER [A,B,C,D] =

Enter the controller number in a range from A - D.

ENTER BASE ADDRESS(ES) OF NODE(S) TO TEST [D] =

Enter the terminal numbers to be used associated with the above controller within a range from 1-63. Thev may be entered in the following formats:

1
1,3,5

TOTAL NUMBER OF NODES BEING TESTED = 2

This statement will print out the number of requested terminals which were successfully attached to the task. If both addresses of a DIS were specified as input, only the base address will be included in the count. The count is the number of nodes not addresses. Both addresses are attached to the task.

```
ADDRESS ** CONTROLLER **

  1            A
  1            B
```

A table of the successfully attached nodes will be printed. The number of entries will match the number of terminals printed in the statement above.

5.2 Local Diagnosis Mode

The following inputs will be entered on a terminal connected to the local DIS being diagnosed by the FS Engineer.

```
>filename
```

Enter any LSI11/IP300 diagnostic file name for which there is an image file on disk. Whenever the prompt character ">" is printed, enter a file name or a CNTRL Z which will allow entry of the termination code.

```
157776
@200G
```

The memory size and an "at" sign will be printed when the diagnostic has been successfully downloaded into LSI memory. The system is in ODT mode and the diagnostic can be started by entering 200G (the standard diagnostic start-up). The diagnostic will operate in stand-alone and will print any messages or errors on the terminal.

To halt the diagnostic and re-enter ODT mode, press the "BREAK" key.

```
017312
@760144/000000 1
```

As the subsystem re-enters ODT mode, the address at which the break was made will be printed (disregard) and an "at" sign. Open location 760144 (CSR4) and enter

1 (to terminate the task) or

2 (to request another diagnostic).

Termination will print a message of @EX. Alternately, a prompt character will be issued for another file name.

NOTE: THE TASK MUST BE TERMINATED IN THIS MANNER. IT CANNOT BE SUCCESSFULLY TERMINATED FROM THE HOST COMPUTER.

5.3 Host Diagnosis Mode

The following messages printed in relation to the running of the hardcore diagnostics are also printed on the host terminal following the execution of local mode. They are the last procedures run in local mode but the first one in host mode.

STARTING HARDCORE DIAG -- NODE AT ADDRESS X CONTROLLER Y WILL GO OFFLINE

This is simple a message warning the user that the terminal should be expected to go offline during these tests.

NODE AT ADDRESS X CONTROLLER Y IS OFFLINE
NODE AT ADDRESS X CONTROLLER Y IS BACK ONLINE

These messages indicate that the terminal did go offline and returned successfully to an online status. If the hardcore diagnostics fail, the DIS will not come back online and an error message will indicate this condition. If the softcore tests (which are the last three tests of the hardcore diagnostics) fail, the unit will return online but error messages indicating the softcore failures will be printed.

SYS ID ** CONTROLLER ** ADDRESS ** MEM SIZE

400 A 1 157776

This is a printout of the system ID, controller, node base address and memory size of the DIS on which hardcore diagnostics were just run.

PRINT ROM ID'S ((N),Y)?

When a "Y" is typed indicating you wish the ROM ID's to be typed, a hexidecimal number in each ROM is read which contains the ROM number in the upper byte and the version number in the lower byte. This number is printed in octal on the Host terminal. The least significant digit printed for each ROM is the version number.

ENTER S FOR SCRIPT, A FOR AUTO-SCRIPT, OR <CR> FOR SINGLE DIAGNOSTIC =

A carriage return will skip over the script mode and allow individual input of diagnostic file names. An "A" should be used for auto-script operation when the desired script already exists. An "S" should be used when a script is to be created and then executed.

When an "A" is input, the following message will be printed.

ENTER SCRIPT NAME =

Enter the name of the script already created that is to be executed.

When an "S" is input, the following is printed.

TO SAVE SCRIPT, ENTER NAME =

If the script is to be saved on disk for future use, enter the name to be used to recall it later. If the script is not to be saved, enter a carriage return and after the script is executed it will be destroyed.

ENTER DIAGNOSTIC FILE NAMES TO BE SCRIPTED AND NUMBER OF PASSES

FILE NAME =

Enter any KDF11/LSI11/IP300 diagnostic for which there is an image file on disk. To terminate a script, type a carriage return after this query.

PASSES [D] =

Enter the decimal number of passes to be executed of the above diagnostic. The maximum is 32768.

These two queries will be repeated until the script is terminated by a carriage return. The script will then be executed.

After the execution of a script, the following query will be printed.

ANOTHER SCRIPT ((N),Y)?

To run another script, enter "Y" and the task will return to the script query. Otherwise, the task will return to the mode query.

If script mode is skipped, the task will jump to this point.

ENTER DIAGNOSTIC FILE NAME =

Enter any KDF11/LSI11/IP300 diagnostic for which there is an image file on disk.

HOW MANY PASSES?

Enter the number of passes to be run of the diagnostic up to a maximum of 32768. However, unlimited iterations of the diagnostic may be run by entering a carriage return. The diagnostic will continue to execute until Diagnostic Monitor is aborted. If unlimited iterations are to be run, the following query will be printed. For a specified number of passes, the pass count will be printed as often as it is uploaded from the diagnostic.

ENTER NUMBER OF PASSES BETWEEN PRINT STATEMENTS [D] =

Enter any decimal number to a maximum of 32768. A carriage return will cause a default to 1000.

ANY PATCHES ((N),Y)?

Enter yes, if there are patches to be made to the diagnostic before it is downloaded.

OPTIONS ARE:

1 = LOAD AND SAVE

This option will patch the diagnostic and save the new version on disk as well as execute the patched version.

2 = LOAD AND GO

This option will patch the diagnostic and execute it but it will not be saved.

3 = PATCH ONLY

This option will patch the diagnostic and save it but it will not be executed.

ENTER OPTION CODE =

Enter the option code selected from the list above.

ENTER PATCHES [ADDRESS/CONTENTS]

Enter the patches by typing first the address to be patched followed by a slash "/" and then the new value to be stored. All addresses to be patched must be entered although not necessarily in sequential order. A line feed will not retrieve the next address. Each entry must be on a separate line and the list terminated by a line with only a carriage return as input.

PATCH TABLE LOADED

This indicates the patches have been successfully accepted.

DOWNLOADING DIAGNOSTIC XXXXXX.IMG;1
ON NODE AT ADDRESS X CONTROLLER Y

Since there is a slight pause as the diagnostic is being downloaded and started, this message is to indicate what is happening. After the diagnostic is started, the pass count will be continuously printed as shown below.

PASSES COMPLETED = 9999 ON TERMINAL X

A pass count will not be printed after every pass since more than one pass may be completed of the diagnostic between uploads from the diagnostic. The last pass count may be greater than the specified number of passes for the same reason.

(ZKMPC ... END OF DIAGNOSTIC

This message indicates the diagnostic has completed the required number of passes.

ANOTHER DIAGNOSTIC ON THE SAME NODE IN HOST MODE ((N),Y)?

If yes, the program will return to the file name query. If no, it will return to the mode query.

5.4 COMMUNICATION MODE

This mode has all the same messages as Host mode except it does not allow scripting. The I/O diagnostic CVPCAx is the only diagnostic presently supported in this mode.

6.0 ERROR REPORTING

Except for the two errors returned under local mode on the local terminal, all errors will be reported on the host termina.. The two exceptions are:

BD = Bad load

NX = Non-existent file

In addition, errors from the LSI11/IP300 diagnostics being run in local mode will be reported on the local terminal as stated earlier.

The errors reported on the host terminal 'all into the following categories.

RSX ERRORS

A knowledge of the RSX operating system would be helpful in interpreting these errors. However, the most common DSW error code will be a -65, which indicates the DIS is offline.

ADDRESS X ON CONTROLLER Y IS NOT SYSGENED IN
ADDRESS X ON CONTROLLER Y CANNOT BE ASSIGNED - DSW =
NODE AT ADDRESS X ON CONTROLLER Y CANNOT BE ATTACHED - DSW =
DOWNLOAD ERROR ON NODE AT BASE ADDRESS X CONTROLLER Y - DSW =
UPLOAD ERROR ON NODE AT BASE ADDRESS X CONTROLLER Y - DSW =
FILE NAME IN ERROR IS XXXXXX
CZKMPC ... DIRECTIVE FAILURE DURING (operation listed below)
CZKMPC ... I/O ERROR DURING (operation listed below)

Terminal Assign Logical Unit Number (ALUN)
Console Prompt
Console Reply
Attach Serial Bus (SB)
Detach SB
CSI (Command String Interpreter)
File Open
File Read
File Write
Kill Attach
SB ALUN
SB GLUN
SB Already Attached
Mark Time
Clear Mark Time
INPUT DATA ERRORS

CZKMPC ... INVALID CONTROLLER
CZKMPC ... INVALID ADDRESS
CZKMPC ... INVALID RESPONSE
CZKMPC ... BASE ADDRESS INPUT EXCEEDS TOTAL
CZKMPC ... MULTIPLE NODES CANNOT BE DIAGNOSED IN LOCAL Mode
NODE AT ADDRESS CONTROLLER Y IS THE UPPER ADDRESS OF A DIS (Warning Only)
CZKMPC ... BAD DATA ON SCRIPT FILE

HARDCORE DIAGNOSTIC ERRORS

NODE AT BASE ADDRESS X CONTROLLER Y REMAINED OFFLINE (Hardcore Failed)

Softcore Failure:

NODE AT BASE ADDRESS X CONTROLLER Y SOFTCORE ERROR 1
NODE AT BASE ADDRESS X CONTROLLER Y SOFTCORE ERROR 2: MEMORY ERROR
NODE AT BASE ADDRESS X CONTROLLER Y SOFTCORE ERROR 3: CPU ERROR

These errors will generate a query regarding whether the user wishes to ignore these errors.

OVERRIDE SOFTCORE ERROR ((N),Y)?

A yes answer will generate the following warning:

WARNING -- TESTING MAY GENERATE UNPREDICTABLE RESULTS

KDF11/LSI11/IP300 ERRORS IN HOST MODE

These errors are reported via the APT window.

DIAGNOSTIC FAILED ON NODE AT ADDRESS X CONTROLLER Y - FATAL ERROR 99

DIAGNOSTIC HUNG ON NODE AT ADDRESS X CONTROLLER Y - NO ACTIVITY

KDF11/LSI11/IP300 ERRORS IN COMMUNICATION MODE

The full error messages will print out onto the Host terminal exactly as it would on the Local terminal when running the KDF11/LSI11/IP300 diagnostics under Local mode. This is done only if the diagnostic being run is fully APT compatible and uses the APT window to pass messages.

7.0 MISCELLANEOUS

All KDF11/LSI11/IP300 diagnostics must be APT-compatible to run under Host or Communication mode.

The Diagnostic Supervisor has not been used in this RSX task.