IBM-POUGHKEEPSIE
December 31, 1964

Diagnostic Engineering Publications

1410/7010

Subject: Diagnostic Program DC01B, DC02B, DC03B, DC04B

Sequence Number 387, 381, 385, 383
Replaces DC01A, DC02A, DC03A, DC04A

I This is a new series of diagnostic programs for the 7631-1302 when used with a 1410/7010 DPS.

II All programs in this package are compatible with "TC50".

III All programs in this package require system and channel control cards.

IV Card deck description (as punched from memory dump tape using TC50.)

DC01	7 Load cards
	1 Core clear
	161 Data cards 001-140
	1 Execute card
DC02	7 Load cards
	1 Core clear
	192 Data cards 001-183
	1 Execute card
DC03	7 Load cards
	1 Core clear
	191 Data cards 001-182
	1 Execute card
DC04	7 Load cards
	1 Core clear
	154 Data cards
	1 Execute card

Enclosures: 285 Pages
Card Deck for CARD ONLY SYSTEMS (as punched by UP51)
Cards - Card Loader and Core Clear
Cards No. Data Cards
Card Execute Card

Distribution: 1410
7010

Other 1410/7010 Installations with 1302-7631

7631 - 1302

ADVANCED DISK FILE DIAGNOSTIC PROGRAM PACKAGE

To be used with 1410/7010 Systems

December 31, 1964

*DC01B	Home Address & Surface Test
*DC02B	1302-7631 Reliability
*DC03B	Electronic Operation
*DC04B	Mechanical Operation

*These programs replace the "A" levels.

NOTE: These programs require system and channel control cards.

December 31, 1964

7631 - 1302

PACKAGE WRITE-UP

6.21.00.0 DESCRIPTION

The programs in this package are designed to test the 7631-1302 when attached to a 1410 or 7010 system. Each program tests a specific area and together the programs make up a diagnostic package.

Program Functions

IDENT	FUNCTION
DC01A	Write HA1's Analyze Surfaces
DC02A	Reliability Test of 7631-1302
DC03A	Electronic Operation Test (7631)
DC04A	Mechanical Test (1302)

It is important to realize that these programs do overlap in scope, and this overlapping should be used to aid in determining which program to run next. Figure 1 will help in showing how the programs are to a degree inter-dependent and overlapping.

Being inter-dependent means certain programs assume correct operation of an area that is tested by another program. In this case DC03 is the only independent program, all others are dependent. This all points out the fact that the programs constitute one overall test of the 1302-7631 and understanding the general test philosophy will aid in learning the individual programs.

The package can be divided into four areas - utility, mechanical-physical, reliability, and electronic.

5.21.00.0 DESCRIPTION (continued)

Utility is covered by the portion of DC01 which prepares the 1302 for useage by writing the home addresses and insuring they are correct. This is generally only run upon installation and may never be used again unless the home addresses are destroyed.

Mechanical-Physical - This area takes into account the condition of the 1302 access mechanism and the physical condition of the disk surfaces on the 1302. DC04 performs the necessary tests on the access mechanism while DC01 analyzes* the disk surface.

Reliability - This makes a general test of the 7631-1302 as an operating device attached to the 1410-7010. DC02 is a test which should tell of trouble areas, including areas of priority and overlap.

Electronic - This area is covered by DC03 which makes a stringent test of the logic in the 7631-1302 and the lines from the 1410-7010 to the 7631. This program attempts to isolate troubles to the smallest possible area, starting with the simplest operation it builds upon the tested logic in order to test other logic.

Within each program is a set of small routines, each routine is to a large degree independent of the other routines in the program, but together the routines test one of the four areas previously described. By using this technique of breaking each program into small parts, the purpose and methods of a test should be easier understood.

* NOTE: Since the 1302 uses the Double Frequency Mode of Recording, Detection of Marginal Surface Areas becomes extremely difficult and the surface analysis is only practical as a Go-No Go Type of Test.

6.21.00.0 DESCRIPTION (continued)

If memory space were available, the entire package could be written as one program, which would certainly simplify the operating procedures, Because this is impossible, a standard operating control system has been designed which is used by all the programs. This system encompasses the following areas, and the remainder of this write-up is devoted to it.

1. Loading Procedure
2. System and Channel Control Cards
3. Standard Pre-Set TAD's (1000-1003)
4. Standard Error Typeout Format
5. Standard Program Options
6. Standard Channel Alter Routine
7. Standard Looping Methods
8. Standard Type Routine
9. Standard Restart Procedures

The standard procedures outlined here will not be repeated in the individual program write-ups since these apply for every program.

6.21.02.0 OPERATING PROCEDURES

The following operating procedures apply to all programs in this package.

02.1 SYSTEM AND CHANNEL CARDS

All the "DC" series programs use system and channel control cards to provide information about -

a. Overlap
b. Priority
c. Machine Type
d. Channels Available
e. Files Available
f. Tapes Available

These cards must be pulled from the card decks and the proper data entered according to the procedure outlined in the 1410/7010 Introductory Material. The system and channel cards in each of these program are numbered card 1, 2, 3, 4, and 5. Cards 4, and 5 apply only to a 7010 and may be discarded on a 1410.

6.21.02.0 OPERATING PROCEDURES (continued)

02.2 STANDARD TADS (1000-1003)

The standard TAD's 1000-1003 are used by all the "DC" series programs. The TAD's are pre-set to "1" when the programs are initially loaded and are changed to a "1" by the use of option 1. Definition of standard TAD's is as follows:

		Not 1	1
01000	TAD 0	Allow error typeouts	Bypass error typeouts
01001	TAD 1	Do not Req loop after error	Req loop after error
01002	TAD 2	No error halts	No error halts
01003	TAD 3	Single program pass	Repeat program

Note: In the "DC" series programs TAD 1 = 1 does not mean unconditional looping; rather it means that after an error has occurred, the program will request if the CE wants to take action. At this point, the CE may take any of the standard program options available. (These options are described later in the write-up.)

Also, TAD 2 = 1 has no meaning as there are no error halts in the "DC" series programs.

Methods for altering the TAD's are discussed later in this write-up under program options.

02.3 SPECIAL TAD's (1004-1012)

Every effort has been made to keep the special TAD's required to a minimum. When special TAD's are required, they will be preset to a 1 condition and may be altered by the CE when so desired. Refer to the individual programs for the definition of the special TAD's that it uses.

6.21.02.0 OPERATING PROCEDURES (continued)

02.4 PROGRAM CONTROL OPTIONS

Each of the "DC" programs has a standard set of control options which are available to the CE through the I/O console printer. Using the Inquiry Request Key the CE may interrupt the program and take any of the control options he desires. The following procedure is used to accomplish this.

a. Press Inquiry Request key

b. When the keyboard unlocks, enter

1) Control option code desired
2) Data required by the program to honor the request

c. Press Inquiry Release key.

Providing a legal option has been requested, the program will immediately honor the request. If the option is illegal (it does not exist), the program returns to the read console operation, a legal option must be requested.

Table 1 shows the options available, and the code and data required to request the option. See control option definitions for details of each option.

Option	Code	Data Required-Enter
End of Test	Blank	None
Alter TAD's (1000-1003)	1	Four new TAD settings desired (all 4 TAD's altered)
Alter Memory	2	Five-digit memory address to be altered
Alter Sequence of Routines	3	01, 03, 04, L Enter routine numbers separated by comma, last character is L or E
Loop a Routine	4	Five-digit starting address of routine to be looped
Loop an Instruction	5	Enter M or L, Ch Code Char, Specific File Op, W or R, BOSIO Op Code, HA1, No. of Rec's, No. of Char's/Rec, Data Char, Rec Addr.
Restart	6	Five-Digit Memory Address to start at
Continue	7	None

TABLE 1

6.21.02.0 OPERATING PROCEDURES (continued)

Definition of Control Options

Code

b. End Test - This option will terminate the test immediately unless TAD 3 = 1, in which case the program would restart from the beginning.

1. Alter TAD's - This option will alter the standard TAD's to those entered after the option code. This option will not alter any special TAD's.

2. Alter Memory - On this option the address to be altered is entered after the option code. After pressing release, the Inquiry Request is pressed again and the alteration is made. Special TAD's may be altered in this manner.

3. Alter Sequence of Routines - This option allows the CE to alter the sequence of the routines in a program. Each routine is numbered in the sequence in which they normally run, i.e., 01, 02, 03, etc., by selecting this option and entering 03, 01, 02, L, the program will run the routines in the requested sequence. A comma is entered between each routine number and the last character entered is an L or E.

   L The program loops on routine sequence entered.

   E The program returns to the program control option routine after one pass. CE now selects a new control option, i.e., continue.

   Any group of routines or all of the routines may be selected in the sequence desired.

   WARNING - Before using this option, one should be very familiar with the functions of the individual routines being selected.

4. Loop a Routine - This option causes the program to loop on the routine whose starting address was entered with the option code. When looping a routine, all error typeouts are bypassed and the loop is ended only by pressing Inquiry Request and selecting another option (probably the continue option).

6.21.02.0 OPERATING PROCEDURES (continued)

5. Loop an Instruction - Through this option the CE may cause the program to loop on any one of the five file operations with data fields of a format requested. The file operations which may be selected are:

Single Record Op
Track Record Op
Home Address Op
Track Record with Addresses
Write Format Op

Besides the control option code, the CE must enter the data required to build the one instruction loop and data field desired. This data must be entered in the following manner after the control option code.

a. M for 6 bit mode
L for 8 bit mode

b.

% - Ch 1	Unoverlap	@ - Ch 1	Overlap
- Ch 2		* - Ch 2	
? = Ch 3		$ - Ch 3	
! - Ch 4		# - Ch 4	

c. 1 for SRO
2 for TWA
5 for HAO
6 for TRO
7 for WFO

d. W for Write
R for Read

e. R Ch 1
X Ch 2
3 Ch 3
1 Ch 4

f. 9#2088 - 9#5988 File Home Address (CE tracks only)
(Enter 6 blanks for SRO)

g. 000-999 Number of Records desired.

h. 0000-5850 Number of Characters/Record

6.21.02.0 OPERATING PROCEDURES (continued)

5. i. X — Any data character desired to be used in the records. (Enter 1 or 3 for Write format.)

j. XXXXXX — Any six-digit record addr desired. This addr will be incremented by 1 for each record. (This will be the search address used for SRO.)

NOTE: When using this option the CE should be aware of the limitations on the number of records versus the number of characters. Knowledge of the existing format track or rewriting the format track (use this option) is necessary to insure valid operation. Once the program enters this loop, the Inquiry Request must be used to exit from the loop. Then another option must be selected, most likely the continue option would be selected. No errors are indicated while in this loop.

6. Restart at Desired Memory Location - This allows the CE to begin at any point in the program by entering the memory location at which the restart is desired. To restart a program from the beginning, always enter 02000.

7. Continue from Point Where Program was Interrupted - This allows the CE to cause the program to continue in a normal fashion after interrupting it for looping purposes or accidently pressing the Inquiry Request.

The program control options described here are available at anytime and should be used as much as possible for aids in troubleshooting.

The control option "Alter Sequence of Routines" will not be available in programs which do not lend themselves to this option. Refer to individual program write-ups for this information.

In addition to the standard options, a program may have a special purpose option available; again refer to the individual program write-ups for this information.

When TAD 1=1 (request action after error), the CE may take any of the control options available by using the procedures outlined here after an error has occurred.

6.21.03.0 OPERATING HINTS

Read and understand the package write-up and program write-ups.

03.1 The alter memory option and loop a routine option could be used to alter a routine for some condition and then loop on the routine altered for troubleshooting the bug.

03.2 Several options may be selected sequentially by pressing Inquiry Request immediately after pressing Release for a selected option.

03.3 To restart a program from the beginning, use option 6 and a starting address of 02000.

03.4 The programs in this package require switch settings before the program is run. Be certain these switches are set. Refer to the program write-ups for details.

03.5 Any routine may be bypassed by altering the first instruction of the routine to an unconditional branch to the exit (or last instruction) of the routine.

6.21.04.0 PROGRAM STOPS AND RESTARTS

The following stops and restart procedures apply to all programs in this package.

04.1 ERROR HALTS

There are no program halts due to error results; TAD 2 = 1 has no meaning in this package of programs.

04.2 NORMAL HALTS

The programs may have normal halts to allow for switch settings; if so, they will be defined in the individual program write-ups.

04.3 AUTOMATIC RESTART PROCEDURE

By setting the check control switch on the console-CE-Test-Panel to Reset and Restart, the programs will automatically restart after a 1410/7010 alarm condition. This can be used to great advantage when looping a routine or instruction which is causing an alarm condition. Furthermore, this technique can be used to insure that once a program is started, it may be left unattented without fear of stopping because of alarms.

6.21.04.0 PROGRAM STOPS AND RESTARTS (continued)

04.4 MANUAL RESTART PROCEDURE

If the check control switch is not used and an alarm condition is encountered, the program can be made to continue by pressing Computer Reset and Start.

6.21.04.0 LOADING PROCEDURES

Use Standard Diagnostic Load Procedures

6.21.05.0 TYPEOUTS

The standard typeouts for all the "DC" series programs are as follows:

05.1 TITLE

The first typeout will be the five-digit program identification.

Example: DC01A

05.2 ERROR TYPEOUTS STANDARD FORMAT

a. All errors will be preceded by "ROUTINE N00."[t] This identifies the failing routine.

b. All status errors, errors indicating status condition on the I/O device, will appear in this format:

*Error	00000	M%F099999W	1248AB
1)	2)	3)	4)

1) Error flag
2) Starting address of failing routine
3) Failing instruction
4) Status indicator that was on

1	Not ready
2	Busy
4	Data Check
8	Ext. Cond.
A	No transfer
B	Wrong length record

t A routine/error index is available in each program write-up to aid in locating an error in the program listing.

6.21.05.0 TYPEOUTS (continued)

05.2 c. All program detected errors, errors for which the computer does not give an indication of error, will appear in the following format. Refer to program listing for explanation of error.

```
*Error     01  02     00000
   1)          2)        3)
```

1) Error flag
2) Error(s) detected during routines
3) Starting address of failing routine

d. Combinations of status errors and program detected errors will appear in this format:

```
*Error   01   00000   M%F099999W        1248AB
```

e. Any data which may be pertinent to the error, i.e., file address, may appear as the third line of the error message. This is not standard and will be given only as required. (See individual program write-ups.)

f. If TAD 1 = 1 (request loop after error), the following will appear; it will be the last line of the error message.

```
REQ ERROR ACTION
```

g. The maximum error message would look like this:

```
ROUTINE N00
*Error 01  00000   M%F099999W        1248AB
PERTINENT DATA
REQ ERROR ACTION
```

05.3 SUMMARY TYPEOUTS

Program which may be run in a reliability mode for long periods of time will give a summary of errors. This summary will be given when:

a. A specific error has occurred ten times
b. The test is terminated.

6.21.05.0 TYPEOUTS (continued)

In the case where a specific error has occurred ten times, the following is typed:

"ERR00 COUNT 10"

The program continues automatically after this typeout.

b. When the program is terminated (manually or by the program itself), a complete summary of errors is typed.

```
"ERROR COUNT"
"00        6"
"01        4"
"07        3"
etc.

"NR  BY  DC  EC  NT  WLR"
" 0   3   1   6   0   12"
```

The first table indicates the number of times a program detected error occurred. This total should be added to the " 10 COUNT" typeouts for any specific error.

The second table is the number of times any of the status indicators were found to be on.

NOTE: The summary is given whether or not TAD 0 is set to 1. This allows normal error typeouts to be bypassed without a loss of information. Refer to the individual programs for information on the availability of the summary typeout.

05.4 END OF TEST MESSAGE

When the program is complete or has been terminated, the word "PASS" is typed out before transferring to the load program.

NOTE: All messages are given on the typewriter.

6.22.00.0 DC01 HOME ADDRESS AND SURFACE TEST DESCRIPTION

This program is made up of 5 tests which may be run in 1 of 4 modes, giving a total of 20 variations. The tests which may be run are:

a. Write home addresses and verify addresses
b. Verify addresses
c. Analyze surfaces
d. Write addr, verify addresses, and analyze surfaces
e. Analyze surfaces and verify addresses

The modes in which these tests may be run are:

a. Entire module - 1 Access
b. One cylinder
c. One surface
d. One track

There is actually one other selection which may be made, this is for flagging a defective track. The flagging routine is available as a program option and would usually be selected only when the surface analysis test has determined that a track is defective.

It is important to remember that the surface analysis and write home address tests will destroy any data on the tracks being tested. This also includes the format track for the cylinder in which the tested tracks are located. The verify addresses test does not destroy any data that may be on the file.

6.22.01.0 OPERATING PROCEDURE

The standard procedures outlined in the package description apply to this program, in addition the following procedures are used to run this program.

01.1 SWITCH SETTINGS PREVIOUS TO RUNNING PROG.

a. HAO Switch ON (On every 7631 to be used)
b. All 1302 accesses not to be tested are set inoperative.
c. All other 7631-1302 switches OFF.

CAUTION: THIS PROGRAM CAN DESTROY CUSTOMER DATA AND/OR FORMATS.

6.22.01.0 OPERATING PROCEDURES (continued)

01.2 SPECIAL REQUESTS

A. "Turn On HAO & CE-WRT SW" (CE turns on these switches)

B. "Tsting ACC x Mod x Ch x" (If the module number access addr, and channel are correct, the CE should enter a 1. If it is not a module and access which is to be tested, a 1 (any character other than 1) is entered and another module and access are selected.)

"Sel Mode" (CE enters on the typewriter one of 20 mode-test variations plus the four digit HA 1 at which the program should start operating.)

ex. 10250

- Mode-Test, write HA1's on the entire module
- Start test at HA1 0250

Note: Reference Operating Hints for rules of selecting modes and starting HA1 address.

The Codes for the 20 Mode-Test Variations

TEST	ENTIRE MOD 1 Access	MODE 1 Cyl.	One Track	One Surface
Write HA1's and verify addr's	1	A	J	/
Verify addr's	2	B	K	S
Analyze surfaces	3	C	L	T
Write HA1's, analyze surfaces and verify addr.	4	D	M	U
Analyze surfaces and verify addr.	5	E	N	V

C. "You have selected to operate on customer tracks, this can result in the loss of customer data. The starting address selected is xxxx. Enter ## *6. If this is correct." (This is a safety check, CE enters something other than ## *6 if selection is incorrect.)

FORMAT KEY FOR WRITE HA'S ETC 1-0000 (ENTIRE ACC)

6.22.01.0 OPERATING PROCEDURE (continued)

01.2 SPECIAL REQUESTS (cont'd)

D. "Turn on Format Sw for Acc & Mod Being Tested"
This request is followed by a halt so that the switch on the appropriate 1302 may be turned on. Press Start to continue.

E. "Select Patterns, Enter 1 To Use V & !, 2 To Use V, 3 To Use !"
(CE selects types of patterns to be used for surface analysis).

F. "CE-HAO ON"
This request is followed by a halt so that the switch on the 7631 may be turned on. Press start to continue.

G. "CE-HAO OFF"
This request is followed by a halt so that the switch on the 7631 may be turned off. Press start to continue.

H. "Selection Error, Safety Interlock Causes Restart"
(If the CE has not selected the starting address correctly, this message is typed out and the program restarts.)

01.3 SPECIAL TADS

There is one special TAD for this program (Memory Location 01004.)

If this TAD is set to a 1, the verify address test will cause all failing addresses to be read from the file and displayed on the typewriter. This TAD is set to 1 when the program is loaded.

01.4 PROCEDURE TO FLAG-A-TRACK

In order to Flag-A-Track, the following procedure should be used:

A. Load DC01
B. When the select mode request is made, enter 20000
C. When the program begins to operate on the file (verify addresses), Press Inquiry Request.

6.22.01.0 OPERATING PROCEDURE (continued)

01.4 PROCEDURE TO FLAG-A-TRACK (cont'd)

D. When the request is honored, enter 8 xxxx Y
   Flag-A-Track option code
   HA1 of track to be flagged
   Flag character to be used
E. Press release and the program will flag the track selected.
F. "TRK Flgd OK" (This message indicates a successful flagging operation, the CE must now select another option, or reselect the flagging routine.)

01.5 STANDARD OPTIONS NOT AVAILABLE IN THIS PROGRAM

Alter routine sequence - Code 3.

6.22.02.0 OPERATING HINTS

02.1 TIMING CONSIDERATIONS

When operating in the "entire module" mode, the program requires rather large amounts of time. The following were timed on a 1410, with accelerator feature, running the entire module:

A.	Write addresses	35 minutes } 1 ACCESS
B.	Verify addresses	15 minutes }
C.	Analyze surface	61 minutes
D.	Write addresses and analyze surfaces	106 minutes
E.	Analyze surfaces and verify addresses	67 minutes

6.22.02.0 OPERATING HINTS (continued)

02.2 CYLINDER MODE

When running in the cylinder mode, the HA1 entered must be for the lowest track in the cylinder to be tested.

02.3 ONE SURFACE

When this mode is selected, the HA1 of the outermost track of the surface to be tested is entered. If the fourth surface is to be tested, HA1 0004 wbuld be entered.

02.4 ENTIRE MODULE - 1 ACCESS MODE

When this mode is selected, the first HA1 in the first cylinder to be tested is entered. The program need not start at cylinder 000, it may start at any cylinder.

02.5 ALTER SPECIAL TAD

Use program option code 2 (alter memory) to alter the special TAD to a 1 or 1. Special TAD location is 01004.

6.22.03.0 PROGRAM STOPS

03.1 ERROR STOPS

None

03.2 NORMAL STOPS

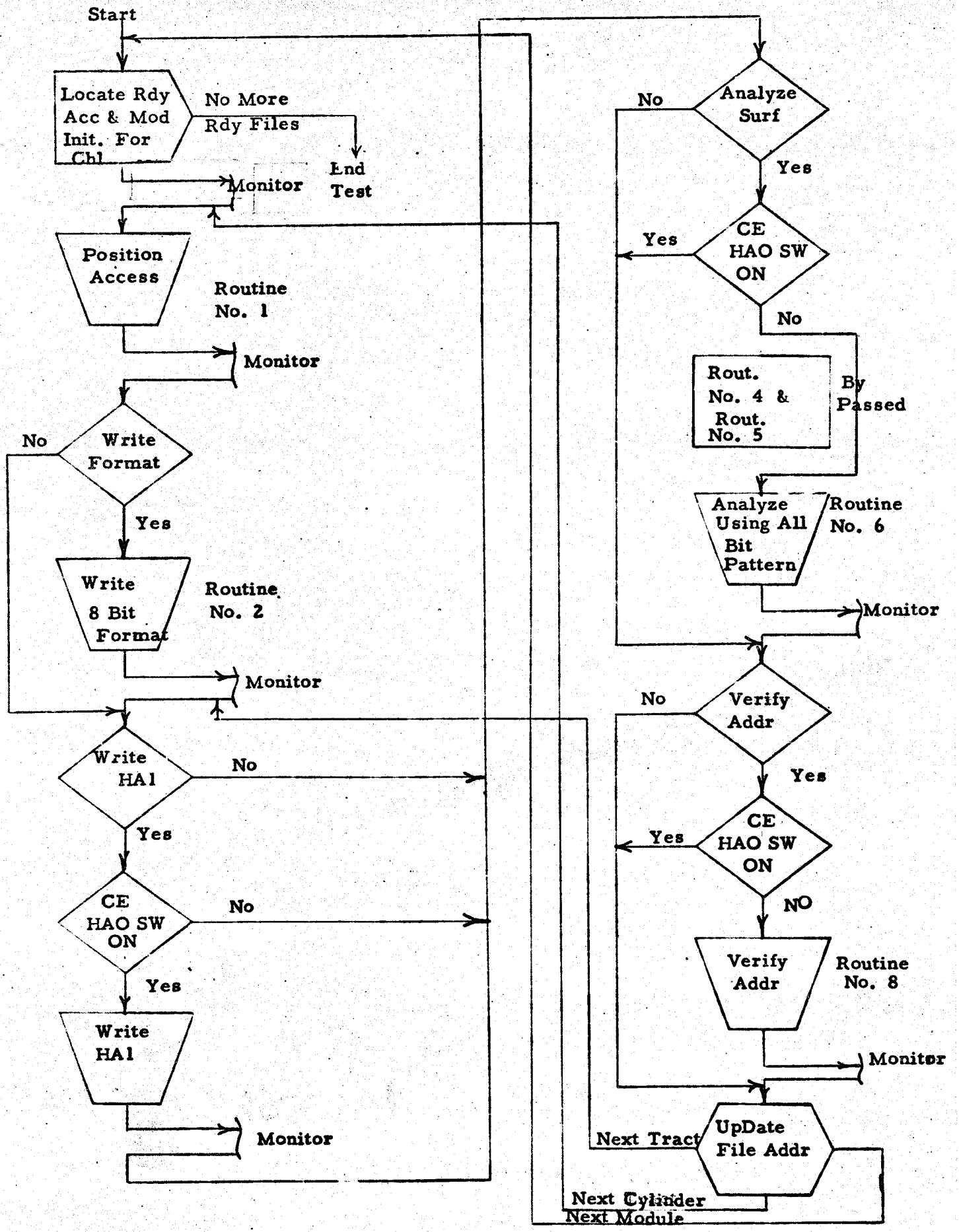
Mem Loc	Reason
04070	Wait for Format to be turned on.
06093	Wait for CE-HAO to be turned off, press Start.
06131	Wait for CE-HAO to be turned on, press Start.
	Test is completed, press Start to go to loader.

6.22.04.0 TYPEOUTS (Other than Request or Standard Typeouts)

Following the standard error message will be the eight-digit file address being used at the time of the error. This will be the third line of the error message.

6.22.05.0 FLOW CHART

The following flow chart is designed to give a general picture of the test routine's relationship to one another.


Start
Locate Rdy Acc & Mod Init. For Chl
No More Rdy Files
End Test
Monitor
Position Access
Routine No. 1
Monitor
No
Write Format
Yes
Write 8 Bit Format
Routine No. 2
Monitor
Write HA1
No
Yes
CE HAO SW ON
No
Yes
Write HA1
Monitor
No
Analyze Surf
Yes
Yes
CE HAO SW ON
No
Rout. No. 4 & Rout. No. 5
By Passed
Analyze Using All Bit Pattern
Routine No. 6
Monitor
No
Verify Addr
Yes
Yes
CE HAO SW ON
NO
Verify Addr
Routine No. 8
Monitor
Next Tract
UpDate File Addr
Next Cylinder
Next Module

6.22.06.0 ROUTINE/ERROR INDEX DC01

To locate routines and errors in the program listing.

```
PGLIN     LABEL     OPCOD  OPERAND                    CT  ADDRS  INSTRUCTION
1002                LCAD
1003                CTL    2
1004
1005                DEFINE STANDARD TADS
1006                **
1007                CRG    1000                       **
1008      TAD0      CCW    a a                            01000
1009      TAD1             a a                         1  01000
1010      TAD2             a a                         1  01001
1011      TAD3             a a                         1  01002
1012                                                    1  01003
1013                DEFINE SPECIAL TADS                **
1014                                                    **
1015      SPTAD0    CCW    a a                         1  01004
1016      SPTAD1           a a                         1  01005
1017      SPTAD2           a a                         1  01006
1018      SPTAD3           a a                         1  01007
1019      SPTAD4           a a                         1  01008
1020      SPTAD5           a a                         1  01009
1021      SPTAD7           a a                         1  01010
1022      SPTAD8           a a                         1  01011
1023      SPTAD9           a a                         1  01012
1024
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1026                       *** I/O DICOST PROGRAM ***
1027                   *** CNE INSTRUCTION LOOP ROUTINE ***
1028          WHEN THE CE SELECTS A CNE INSTRUCTION LOOP THE I/O INSTRUCTION
1029        IN THIS ROUTINE IS ALTERED AND THE LOOP IS ENTERED.NOTE THAT THE
1030         BRANCH ON INQUIRY INSTRUCTION IS THE ONLY EXIT FROM THE LOOP.
1031     LOOP      MC     %11,C,R          I/O INST BEING LOP C     10  01013  M %11 00000 R
1032               BAL    *61                                       7  01023  R 01030 M
1033               BNQ    PRGCTL           BRCH ON INQ TO PRGCL     7  01030  J 02273 Q
1034               B      LOOP             CONTINUE TO LOOP         7  01037  J 01013
1035               H                                                1  01044  .
1036
```

```
PGLIN     LABEL     OPCOD  OPERANC                                  CT  ADDRS  INSTRUCTION

1038                       *** I/C DICOST PROGRAM ***
1039                     *** CHANNEL ALTER ROUTINE ***
1040          THIS ROUTINE ALTERS ALL I/O INSTRUCTIONS,BRANCH-ON-STATUS-
1041        INDICATOR-ON INSTRUCTIONS,AND BRANCH ON CHANNEL OVERLAP IN PRO-
1042        CESS INSTRUCTIONS ACCORDING TO THE CHANNEL INDICATED.THIS IS DONE
1043        BY SCANNING A DEFINED AREA OF MEMORY AND ALTERING THESE INSTRUC-
1044        TIONS.
1045
1046      CHALTR    SER     X5          STORE ADDR                    7  01045  G 00049 B
1047                MLCA    9&X5,X7     LOAD IX6 & IX7               12  01052  D 00*+9 00059 I S
1048      SCAN      SCNLA   0&X6,0&X6   SCAN FOR WP                  12  01064  D 00*.0 00*.0 B
1049                SAR     X6          STORE ADDR OF OPER            7  01076  G 00054 A
1050                C       X6,X7       HAS ALL OF FLD BEEN          11  01083  C 00054 00059
1051                BE      13&X5       SEARCHED IF SO BRCH           7  01094  J 00*/3 U
1052                MLCS    1&X6,*&12   STORE OP CODE                12  01101  D 00*.1 01124 3
1053                BCE     MLCRU,CODES,  IS OP CODE M               12  01113  B 01149 02598
1054                BCE                 IS OP CODE L                  1  01125  B
1055                BCE                 IS OP CODE U                  1  01126  B
1056                BCE     RX3OR1      IS OP CODE R                  6  01127  B 01168
1057                BCE                 IS OP CODE X                  1  01133  B
1058                BCE                 IS OP CODE 3                  1  01134  B
1059                BCE                 IS OP CODE 1                  1  01135  B
1060                BCE     JAY         IS OP CODE J                  6  01136  B 01187
1061                B       SCAN        GO FIND NEXT OPER             7  01142  J 01064
1062      MLCRU     MLCS    10&X5,2&X6  CHEANGE CH-MODE CHAR          12  01149  D 00*/0 00*.2 3
1063                B       SCAN        GO FIND NEXT OPER             7  01161  J 01064
1064      RX3CR1    MLCS    11&X5,1&X6  CHANGE B-I-S-I-C OP          12  01168  D 00*/1 00*.1 3
1065                B       SCAN        GO FIND NEXT OPER             7  01180  J 01064
1066      JAY       MLCS    7&X6,*&12   STORE MODIFIER               12  01187  D 00*.7 01210 3
1067                BCE     ONE234,MODS,  IS MODIFIER A 1            12  01199  B 01221 02602
1068                BCE                 IS MODIFIER A 2               1  01211  B
1069                BCE                 IS MODIFIER A 3               1  01212  B
1070                BCE                 IS MODIFIER A 4               1  01213  B
1071                B       SCAN        GO FIND NEXT OPER             7  01214  J 01064
1072      ONE234    MLCS    12&X5,7&X6  CHANGE BCL MODIFIER          12  01221  D 00*/2 00*.7 3
1073                B       SCAN        GO FIND NEXT OPER             7  01233  J 01064
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
1074                H                                                        1  01240  .
1075
1076
1077                DEFINE SYSTEM & CHANNEL CONTROL CARDS
1078
1079                ORG    1233                                                01233
1080                DCW    @FP6FMLFMTFMC3E7/5@                              17  01249
1081                                                        **
1082                DEFINE PROGRAM TITLE
1083                                                        **
1084                ORG    125C                                                01250
1085                DCW    @DCC18@,G          DCO1                           5  01254
1086
1087                LOCATE THE SYSTEM & CHANNEL CARDS
1088
1089                ORG    1256                                                01256
1090      SYSTEM    DC     @                                          @    50  01256
1091                       @      @                                           7  01312
1092                ORG    1289                                                01289
1093      CHNL1     DC     @                                          @    50  01289
1094                       @      @                                           7  01345
1095                ORG    1346                                                01346
1096      CHNL2     DC     @                                          @    50  01346
1097                       @      @                                           7  01402
1098                ORG    14C3                                                01403
1099      CHNL3     DC     @                                          @    50  01403
1100                       @      @                                           7  01459
1101                ORG    1460                                                01460
1102      CHNL4     DC     @                                          @    50  01460
1103                       @      @                                           7  01516
1104
```

```
PGLIN   LABEL    OPCOD  OPERAND                    CT  ADDRS  INSTRUCTION
1106                 *** I/O DICOST PROGRAM ***
1107               *** TYPE AND REQUEST FOR INTERVENTION ***
1108        THIS ROUTINE IS USED TO TYPE ALL MESSAGES AND REQUESTS FOR
1109      MANUAL INTERVENTION.THE ROUTINE WILL TYPE A MESSAGE FROM A COMMON
1110      DATA FIELD,OR THE MESSAGE MAY BE LOCATED IMMEDIATELY AFTER THE
1111      BRANCH INSTRUCTION TO THIS ROUTINE.IF A REPLY IS REQUIRED A READ
1112      CONSOLE PRINTER OPERATION IS ISSUED.THIS ROUTINE IS USED TO TYPE
1113      ALL MESSAGES IN THIS PROGRAM.
1114
1115   TYMES   SBR    TYPXIT&5          STORE RETURN ADDR            7  01517  G 01591 B
1116   TYPE    WCP    201               TYPE MESSAGE                10  01524  M *TO 00201 M
1117           BEXI   *-16,M S          BRCH ON ANY BUT WLR          7  01534  R 01524 MSNGM
1118           BAI    *&1                                            7  01541  R 01548 MSNGM
1119   SW11    NOPWM                                                 1  01548  N
1120   LAB60   RCP    0                 READ CONSOLE PRINTER        10  01549  M *TO 00000 R
1121           BEXI   *-16,M S          BRCH ON ANY BUT WLR          7  01559  R 01549 MSNGM
1122           BAI    *&1                                            7  01566  R 01573 MSNGM
1123           CW     SWI1&1            TURN OFF SWITCH 11           6  01573  B 01549
1124           CS     33C               CLEAR PRINT AREA             6  01579  / 00330
1125           CS                                                    1  01585  /
1126   TYPXIT  B      0                 RETURN TO DICOST             7  01586  J 00000
1127   TYP1    SBR    X1                STORE ADDR OF MESG           7  01593  G 00029 B
1128           B      *&14                                           7  01600  J 01620
1129   TYP2    SBR    X1                STORE ADDR OF MESG           7  01607  G 00029 B
1130           SW     REPLY&1           TURN ON REPLY SW             6  01614  , 01652
1131           WCP    0&X1              TYPE MESSAGE                10  01620  M *TO 000*0 M
1132           SBR    X5                SAVE ADDRESS                 7  01630  G 00049 BSNGM
1133           BEXI   *-23,M S          BRCH ON ANY BUT WLR          7  01637  R 01620 MSNGM
1134           BAI    *&1                                            7  01644  R 01651 MSNGM
1135   REPLY   NOPWM                    BRCH                         1  01651  N
1136           B      RCCCN             IF REPLY REQUIRED            7  01652  J 01666
1137           B      0&X5              RETURN                       7  01659  J 0C**0
1138   RCCCN   RCP    0&X5              REPLY TO MSG                10  01666  M *TO 00**0 B
1139           SBR    X1                SAVE ADDR                    7  01676  G 00029 BSNGM
1140           BEXI   *-23,M S          BRCH ON ANY BUT WLR          7  01683  R 01666 MSNGM
```

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PGLIN     LABEL     OPCOD  OPERAND
1141                BAL    *&1                                  CT  ADDRS  INSTRUCTION
1142                CH     REPLY&1                               7  01690  R 01697 G
1143                B      O&X1          RETURN                  6  01697  N B 01652
1144      CATA      MLCWS  @N&,PASS1     RESET FIRST PASS INST   7  01703  J 000*0
1145                BCE    *&13,1264,1   BRCH IF PRIORITY AVAILABLE 12 01710  D 08965 01944 7
1146                MLCWS  @N&,MCNITR67  ALTER PRIORITY INST TO NO-OP 12 01722 B 01746 01264 1
1147                MRCHG  *&9,1230      RESTORE CHANNEL ALTER ROUTINE 12 01734 D 08965 02108 7
1148                B      PASS167       RETURN TO NORMAL INITIALIZE 12 01746 D 01766 01230 C L
1149                H                                             7  01758  J 01951
1150                CC     a'.73&                                 1  01765  .
1151                CCW    a,a                                    3  01768
1152                CC     SCAN                                   1  01769
1153                CC     a a                                    5  01774  01064
1154                CCW    a.a,G                                  1  01775
1155                                                              1  01776
1156                *** ERROR TABLES THESE ARE USED FOR ERROR ***
1157                *** SUMMARIES AND ERROR INDENTIFICATION ***
1158
1159                CRG    *&XCC                                     01800
1160                CRG    *&1                                       01801
1161      STPTAB    CCW    a,C,L&                                 1  01801
1162      E1        CC     a a                                    1  01802
1163      E2                a a                                    1  01803
1164      E3                a a                                    1  01804
1165      E4                a a                                    1  01805
1166      E5                a a                                    1  01806
1167      E6                a a                                    1  01807
1168      E7                a a                                    1  01808
1169      E8                a a                                    1  01809
1170      E9                a a                                    1  01810
1171      E10               a a                                    1  01811
1172      E11               a a                                    1  01812
1173      E12               a a                                    1  01813
1174      E13               a a                                    1  01814
1175      E14               a a                                    1  01815
1176      E15       CC      a a                                    1  01816
```

PGLIN	LABEL	I/O CPCCD	DICOST TYPE OPERANC	CT	ADDRS	INSTRUCTION
1177	E16		@ @	1	01817	
1178	E17		@ @	1	01818	
1179	E18		@ @	1	01819	
1180	E19		@ @	1	01820	
1181	E20		@ @	1	01821	
1182	E21		@ @	1	01822	
1183	E22		@ @	1	01823	
1184	E23		@ @	1	01824	
1185	E24		@ @	1	01825	
1186	E25	DC	@ @	1	01826	
1187	E26	DC	@ @	1	01827	
1188	E27		@ @	1	01828	
1189	E28		@ @	1	01829	
1190	E29		@ @	1	01830	
1191	E30		@ @	1	01831	
1192	E31		@ @	1	01832	
1193	E32		@ @	1	01833	
1194	E33		@ @	1	01834	
1195	E34		@ @	1	01835	
1196	E35		@ @	1	01836	
1197	E36		@ @	1	01837	
1198	E37		@ @	1	01838	
[illegible]	E38		@ @	1	01839	
1200	E39		@ @	1	01840	
1201	E40		@ @	1	01841	
1202	E41		@ @	1	01842	
1203	E42		@ @	1	01843	
1204	E43		@ @	1	01844	
1205	E44		@ @	1	01845	
1206	E45		@ @	1	01846	
1207	E46		@ @	1	01847	
1208	E47		@ @	1	01848	
1209	E48		@ @	1	01849	
1210	E49		@ @	1	01850	
1211	E50		@ @	1	01851	
1212	E51	DC	@ @	1	01852	

PGLIN	LABEL	I/C	DICOST TYPE OPERAND	CT	ADDRS	INSTRUCTION
1213	E52		@ @	1	01853	
1214	E53		@ @	1	01854	
1215	E54		@ @	1	01855	
1216	E55		@ @	1	01856	
1217	E56		@ @	1	01857	
1218	ERRTAB	CC	@+@	1	01858	
1219		CC	@ @	1	01859	
1220						

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1222                ***  INITIALIZE ROUTINE FOR THE DICOST PROGRAM  ***
1223      INITLE    WCP    1250                 PRINT TITLE                 10  01860  M %TO 01250 W
1224                BCB1   *-16                                              7  01870  R 01860 2
1225                BAI    *&1                                               7  01877  R 01884 M
1226                CS     99                   RESET IND REG 5             6  01884  / 00099
1227                SW     25                   SET WM IN IND REG 1         6  01890  , 00025
1228                MLCS   a**a,10C             PREPARE TO LOAD 2-15       12  01896  D 08966 00100 3
1229                MRWR   25,30                LOAD IND REG 2-15          12  01908  D 00025 00030 3
1230                MRCHG  RESUME,1             MOVE RESET PROCEDURE       12  01920  D 02015 00001 L
1231                MRCHG  INTR,1C1             MOVE INTERUPT PROC         12  01932  D 02007 00101 L
1232      PASS1     B      DATA                 GO DO  MORE INITIALIZING    7  01944  J 01710
1233                CW     LPRT,SW11&1                                     11  01951  ¤ 02610 01549
1234                CS     E5&                  CLEAR AND RESET             6  01962  / 01857
1235                MLCWS  aLa,STPTAB            ERROR TABLE               12  01968  D 08967 01801 7
1236                B      START                GO TO ROUTINE INIT.         7  01980  J 03450
1237
1238                H                                                       1  01987  .
1239                ORG    2CC0                                                02000
1240                B      INITLE                                           7  02000  J 01860
1241                ***  RESET & INTERUPT ROUTINES,THESE ROUTINES  ***
1242                ***  ARE MOVED TO LOCATIONS 1 & 1C1
1243      INTR      BAC    PROCTL               RETURN TO PROG CNTRL        7  02007  J 02273 Q
1244                CCW    aMa                                              1  02014
1245      RESUME    B      CKLUP                                            7  02015  J 02023
1246                CCW    aMa                                              1  02022
1247      CKLUP     BW     MONITR,LPRT          CHECK FOR LOOP ROUT        12  02023  V 02101 02610 1
1248                BW     LOOP,LPINST          CHECK INST LOOP SW         12  02035  V 01013 02611 1
1249                CW     SW11&1,EXTRA&1       CLEAR TYPE & ERROR SWITCHES 11  02047  ¤ 01549 03017
1250                CW     REPLY&1                                          6  02058  ¤ 01652
1251                CS     E5&                  CLEAR ERROR TABLE           6  02064  / 01857
1252                MLCWS  aLa,STPTAB                                       12  02070  D 08967 01801 7
1253                MLNA   X3,X2                LOAD IX 2                  12  02082  D 00039 00034 /
1254                B      MONITR&7             GO TO MONITR                7  02094  J 02108
1255
```

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PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1257                       *** I/O DICOST PROGRAM ***
1258                   ***      MONITOR ROUTINE      ***
1259          THE MONITOR IS ENTERED AFTER EVERY TEST ROUTINE IS COMPLETED,OR
1260        A STATUS ERROR HAS BEEN DETECTED AND INDICATED.IN THE CASE OF A
1261        STATUS ERROR MONITOR SIMPLY BRANCHES BACK TO THE POINT AT WHICH
1262        THE STATUS ERROR WAS DETECTED.WHEN ENTERED FROM THE END OF A
1263        TEST ROUTINE MONITOR CHECKS TO SEE IF THE CE PRESSED INQUIRY,THE
1264        ROUTINE IS BEING LOOPED,ANY ERRORS OCCURED,ALTER ROUTINE SEQUENCE
1265        IS SELECTED,OR THE NEXT SEQUENCIAL ROUTINE SHOULD BE RUN.
1266
1267     MONITR    SER    X2               STORE ADDR                        7  02101  G 00034 8
1268               BXPA   *81              EXIT ALERT MODE                   7  02108  Y 02115 X
1269               BNO    PROCTL           WAS THERE AN INQ                  7  02115  J 02273 Q
1270     MONIT1    BW     0&X3,LPRT        RETURN IF LOOPING RT              12 02122  V 000P0 02610 1
1271     MONIT2    MLCWS  &M&,224          SET WMSG SHORT MESG               12 02134  D 08968 00224 7
1272               B      ERROTL                                             7  02146  J 02670
1273     MONIT3    NOP                                                       1  02153  N
1274               MLCWA  X2,X3            LOAD IX3                          12 02154  D 00034 00039 X
1275               MLCWS  & &,224          CLEAR WMSG                        12 02166  D 08969 00224 7
1276               B      0&X2             GO TO NEXT ROUTINE                7  02178  J 000.0
1277     WHERE2    MLCWS  *-12,224         CLEAR WMSG                        12 02185  D 02184 00224 7
1278               BCE    *&&,0&X2,N       BRCH IF ROUT COMP                 12 02197  B 02216 000.0 N
1279               B      0&X2             RETURN TO ROUTINE                 7  02209  J 000.0
1280               BZN    *&&,1&X2,2       BRCH IF CHAR IS NUMR              12 02216  V 02235 000.1 2
1281               B      0&X2             RETURN TO ROUTINE                 7  02228  J 000.0
1282               BZN    *&&,2&X2,2       BRCH IF CHAR IS NUMR              12 02235  V 02254 000.2 2
1283               B      0&X2             RETURN TO ROUTINE                 7  02247  J 000.0
1284               BW     MONIT3,3&X2      BRCH IF CHAR HAS W                12 02254  V 02153 000.3 1
1285               B      0&X2             RETURN TO ROUTINE                 7  02266  J 000.0
1286
```

```
PGLIN   LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1288                     *** I/O DICOST PROGRAM ***
1289                *** PROGRAM CONTROL ***
1290          WHEN THE CE PRESSES INQUIRY TO SELECT A STANDARD PROGRAM OPTION
1291        THIS ROUTINE IS ENTERED.THE C.E ENTERS ON THE TYPEWRITER THE
1292        OPTION CODE DESIRED,ALONG WITH THE DATA NEEDED BY THE OPTION.THE
1293        ROUTINE DETERMINES WHICH OPTION HAS BEEN SELECTED AND INITIATES
1294        THE OPTION.
1295
1296    PRGCTL      RCPW    CTLFLD           READ THE CONSOLE PRT        10  02273  L &TO 00201 R
1297                SBR     X1                                           7  02283  G 00029 B
1298                BEXI    PRGCTL,M S       BRCH ON ANY BUT WLR         7  02290  R 02273 SM
1299                SW      CTLFLD&1                                     6  02297  , 00202
1300                BAI     *&1                                          7  02303  R 02310 GM
1301                CW      LPRT,LPINST      TURN OFF LOOP SWS           11  02310  ¤ 02610 02611
1302                MLWS    *,E1             CLEAR WM IN ERROR           12  02321  D 02332 01802 4
1303                MWWR    E1,E2              TABLE                     12  02333  D 01802 01803 2
1304                MLCS    CTLFLD,*&12      MOVE CTL CODE ENTERD        12  02345  D 00201 02368 3
1305                BCE     ENDTST,CTLCOD,   IS CTL CODE BLANK           12  02357  8 08742 02609
1306                BCE     ALTACS           IS CTL CODE 1                6  02369  B 02424
1307                BCE     ALTMEM           IS CTL CODE 2                6  02375  B 02447
1308                BCE     LUPRT            IS CTL CODE 4                6  02381  B 02494
1309                BCE     ONELUP           IS CTL CODE 5                6  02387  B 02523
1310                BCE     RSTART           IS CTL CODE 6                6  02393  B 02557
1311                BCE     CONT             IS CTL CODE 7                6  02399  B 02580
1312                BCE     NIC,CTLFLD,8     BRCH TO FLAG ROUTINE        12  02405  B 07201 00201 8
1313                B       PRGCTL                                        7  02417  J 02273
1314    ALTACS      MLCA    CTLFLD&4,1003    MOVE IN NEW TACS            12  02424  D 00205 01003 1
1315                CS      MONIT1,299       CLEAR OUT CTL FLD           11  02436  / 02122 00299
1316    ALTMEM      MLCA    CTLFLD&5,*&9     MOVE ADDR TO BE ALTR        12  02447  D 00206 02467 1
1317                RCPW    0                ALTER MEMORY                10  02459  L &TO 00000 R
1318                BEXI    *-16,M S         CHECK ALL BUT WLR            7  02469  R 02459 SMG
1319                BAI     *&1                                           7  02476  R 02483 M
1320                CS      MONIT1,299       CLEAR THE CNTRL FLD         11  02483  / 02122 00299
1321    LUPRT       SW      LPRT             TURN ON LOOP SWITCH          6  02494  , 02610
1322                MLNA    CTLFLD&5,X2      LOAD IND REG2               12  02500  D 00206 00034 /
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                        I/O DICOST PROGRAM CONTROL                                                    DCOL          PAGE  35
PGLIN     LABEL     OPCOD  OPERAND                                                          CT  ADDRS  INSTRUCTION
1323                CS     MONIT2,299          CLEAR CNTRL FLD                           11  02512  / 02134 00299
1324      CKELUP    SW     LPINST              TURN ON LOOP INST SW                       6  02523  . 02611
1325      LUPINT    NOPWM                      THIS SW IS TURNED ON                       1  02529  N
1326                B      *&&                    BY ERRCTL                              7  02930  J 02544
1327                B      PREP                GO TO PREPARE ROUT                        7  02537  J 07869
1328                CW     LUPINT&1            TURN OFF SW                               6  02544  ¤ 02530
1329                B      LOOP                                                          7  02550  J 01013
1330      RSTART    PLNA   CTLFLD&S,X2          LOAD IND REG2                            12  02557  D 00206 00034 /
1331                CS     MONIT2,299          CLEAR CNTRL FLD                          11  02569  / 02134 00299
1332      CONT      CS     WHERE2,299          CLR CNTL FLD                             11  02580  / 02185 00299
1333
1334                I/O DICOST CONSTANTS
1335      CODES     DCW    @J13XRULP@                                                    8  02598
1336      PODS      DCW    @43218@                                                       4  02602
1337                DCW    @7@                                                           1  02603
1338                DC     @6@                                                           1  02604
1339                       @5@                                                           1  02605
1340                       @4@                                                           1  02606
1341                       @2@                                                           1  02607
1342                       @1@                                                           1  02608
1343      CTLCOD           @ @                                                           1  02609
1344      LPRT      DC     @ @                                                           1  02610
1345      LPINST    DC     @ @                                                           1  02611
1346      ADDR02    DCW    ERRTAB              ADDR OF ERR TABLE                         5  02616  01858
1347      ERR       DCW    @*ERROR@                                                      6  02622
1348       ACTION   DC     @REG ERROR ACTION@,G                                         16  02623
1349      ERCODE    DCW    @547P@                                                        4  02643
1350       SAVIND   DCW    @1 2 4 8 A B@,G                                              11  02644
1351       STIND    DC     @1 2 4 8 A B@,G                                              11  02656
1352       ADERSW   DC     @ @                                                           2  02668
1353
```

```
PGLIN   LABEL     OPCOD  OPERANC                          CT  ADDRS  INSTRUCTION
1355                    *** I/C DICOST PROGRAM ***
1356              ***       ERROR CONTROL       ***
1357        THIS RCUTINE DETERMINES IF ANY STATUS ERRORS OR PROGRAM DETECT-
1358        ED ERRORS HAVE TO BE INDICATED.IF THERE ARE THIS RCUTINE BUILDS
1359        THE ERROR MESSAGE AND HAS IF TYPED OUT.THIS RCUTINE ALSO CHECKS
1360        TAC 1 TC SEE IF A REQUEST FOR ERROR ACTION SHCULD BE MADE.
1361
1362              LOCATE FAILING INST
1363
1364   ERRCTL     MLCA    X2,X5              LOAD IND REG 5          12  02670  D 00034 00049 I
1365              S       @1@,X5                                     11  02682  S 08970 00049
1366              SCNLA   0&X5,0&X5          SCAN THE RCUTINE        12  02693  D 00**0 00**0 S B
1367              SAR     X5                 STORE CHAR ADDR          7  02705  G 00049 A
1368              MLCS    1&X5,*&12          MOVE CHAR TC BE CHKD    12  02712  D 00**1 02735 3
1369              BCE     GOTONE,CODES,      IS OP CODE M            12  02724  B 02768 02598
1370              BCE                        IS OP CODE L             1  02736  B
1371              BCE     SHORT1             IS OP CODE U             6  02737  B 02787
1372              C       X3,X5              HAS RCUTINE BEEN        11  02743  C 00039 00049
1373              BL      LOOFLO              SEARCHED                7  02754  J 02811 T
1374              B       ERRCTL&12          GO CONTINUE THE SRCH     7  02761  J 02682
1375   GOTONE     MLCWA   10&X5,LOOP&9       LOAD THE LOOP INST      12  02768  D 00*/0 01022 X
1376              B       LOOFLO                                      7  02780  J 02811
1377   SHORT1     MLCWA   5&X5,LOOP&9        LOAD THE LOOP INST      12  02787  D 00**5 01022 X
1378              MLCS    @N@,LOOP           SET NC-OP FOR SHORT     12  02799  D 08965 01013 3
1379                                       INSTRUCTION
1380   LOOFLO     MLCA    LOOP&9,234         MOVE FAILING OPER       12  02811  D 01022 00234 T
1381              MLNA    X3,223             MOVE ADDR OF RCUT       12  02823  D 00039 00223 /
1382              ZA      ADDRC2,X1          LOAD NC REG 1           11  02835  M 02616 00029
1383              ZA      @OC209@,X5         LOAD IND REG 5          11  02846  M 08975 00049
1384                   SCAN ERROR TABLE & UPDATA ERROR COUNT
1385   ERSCAN     SCNLA   0&X1,0&X1          SCAN THE ERROR TABLE    12  02857  D 000*0 000*0 S B
1386              SAR     X1                 STORE ADDR               7  02869  G 00029 A
1387              BCE     AFTSRH,1&X1,L D    HAS TABLE BEEN COMP.    12  02876  B 02935 000*1 D L
1388              SW      X1-1              DEFINE ERROR              6  02888  , 00028
1389              MLNWA   X1,0&X5            MOVE ERROR CODE NO.     12  02894  D 00029 00**0 V
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1390                A      @3@,X5              UPDATE IND REG 5     11  02906  A 08976 00049
1391                                          NINE TIMES
1392                Sk     1&X1,X1-1          CLEAR WM S            11  02917  ¤ 00041 00028
1393                B      ERSCAN                                   7  02928  J 02857
1394                     LOAD PRINT FIELD WITH ERROR MESG
1395      AFTSRH    BCE    WHERE2,1CCC,1      BRCH IF BYPASSING ERRORS  12  02935  B 02185 01000 1
1396      ERRCSW    NOP                                              1  02947  N
1397                BCE    WHERE2,2C9         BRCH IF NO ERRORS     12  02948  B 02185 00209
1398                Sk     ERRCSW&1           RESET ERROR SW        6  02960  , 02948
1399                MLCA   ERR,2C6            MOVE ERROR            12  02966  D 02622 002C6 T
14C0                MLCA   2&X3,RCUTID        MOVE RCUTINE IDENT    12  02978  D 000M2 03007 T
14C1                B      TYP1               GO TYPE RCUTINE ID    7  02990  J 01593
14C2                CCW    @RCUTINE @                               8  03004
14C3      RCUTID    CC     @   @,G                                  3  03007
14C4                B      TYPES                                    7  03009  J 01517
14C5                     TYPE ADDITIONAL  ERROR INFORMATION
14C6      EXTRA     NOPWM                                            1  03016  N
14C7                WCP    DATA               PRINT EXTRA DATA      10  03017  M %TO 01710 W
14C8                BCB1   *-16                                     7  03027  R 03017 2
14C9                BA1    *&1                                      7  03034  R 03041 M
1410                Sk     EXTRA&1                                  6  03041  ¤ 03017
1411                MRCWG  FILE,ADRMES&1C     MOVE FILE ADDRESS USED  12  03047  D 09891 03076 D L
1412                B      TYP1                                     7  03059  J 01593
1413      ADRMES    CCW    @FILE ADDR         @,G                   18  03066
1414      ACT       BCE    *&&,1CC1,1         LOOP ACTION REQUIRED  12  03085  B 03104 01C01 1
1415                B      WHERE2                                   7  03097  J 02185
1416                Sk     LUPINT&1           TURN ON SWITCH        6  03104  , 02530
1417                MRCWG  ACTION,2C1         MOVE ACTION MESG      12  03110  D 02623 00201 D L
1418                B      TYPES                                    7  03122  J 01517
1419                B      PROCTL                                   7  03129  J 02273
1420
1421                   *** I/O DIOCST PROGRAM ***
1422                *** DETERMINE WHICH STATUS INDICATORS ARE ON ***
1423          THIS RCUTINE DETERMINES WHICH STATUS INDICATORS ARE ON,ON THE
1424           CHANNEL BEING USED.THE INDICATORS FOUND  ON ARE STORED IN THE
```

```
PGLIN   LABEL     OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1425        PRINT FIELD AND THE PROGRAM BRANCHES TO ERROR CONTROL.
1426    STACHK    SBR    X5                 STORE ADDR IN IND 5   7  03136  G 00049 8
1427              SBR    X2                                       7  03143  G 00034 8
1428              BW     0&X2,LPRT                                12  03150  V 000.0 02610 1
1429              S      @7@,X5             REDUCE ADDR BY 7      11  03162  S 08977 00049
1430              MLCS   0&X5,LOOP&10                             12  03173  D 00**0 01023 3
1431              MRCWG  STINC,237          MOVE STATUS CODES     12  03185  D 02656 00237 L
1432              MLCS   0&X5,NLOPCD        STORE CHNL CODE       12  03197  D 00**0 03227 3
1433              B      CHALTR                                   7  03209  J 01045
1434              CCW    CNTERR             HIGH LIMIT            5  03220  03382
1435              CC     NOTRDY             LOW LIMIT             5  03225  03240
1436              CCW    @ @                                      1  03226
1437    NLOPCD    CC     @ @                                      1  03227
1438              CC     @ @                                      1  03228
1439              ZA     @CC237@,X5         LOAD IX 5             11 03229  M 08982 00049
1440    NOTRDY    NOP                                             1  03240  N
1441              BNR1   CNTERR             CHECK FOR NOT READY   7  03241  R 03382 1
1442              B      UPIX               GO UPDATE IND REG     7  03248  J 03413
1443    BUSY      NOP                                             1  03255  N
1444              BC81   CNTERR             CHECK FOR BUSY        7  03256  R 03382 2
1445              B      UPIX               GO UPDATE IND REG     7  03263  J 03413
1446    DATACK    NOP                                             1  03270  N
1447              BER1   CNTERR             CHECK DATA CHK        7  03271  R 03382 4
1448              B      UPIX               GO UPDATE IND REG     7  03278  J 03413
1449    EXTCND    NOP                                             1  03285  N
1450              BEF1   CNTERR             CHECK FOR EXT COND    7  03286  R 03382 8
1451              B      UPIX               GO UPDATE IND REG     7  03293  J 03413
1452    NOTRNS    NOP                                             1  03300  N
1453              BNT1   CNTERR             CHECK FOR NO TRANS    7  03301  R 03382 S
1454              B      UPIX               GO UPDATE IND REG     7  03308  J 03413
1455    WLR       NOP                                             1  03315  N
1456              BWL1   CNTERR             CHECK FOR WLR         7  03316  R 03382 -
1457              B      UPIX               GO UPDATE IND REG     7  03323  J 03413
1458              SW     NOTRDY&1,BUSY&1    RESET INSTRUCTIONS    11 03330  , 03241 03256
1459              SW     DATACK&1,EXTCND&1                        11 03341  , 03271 03286
```

```
PGLIN     LABEL     OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1460                Sh     NOTRNS&1,WLR&1                   11  03352  , 03301 03316
1461                MRCG   237,SAVIND       SAVE IND      12  03363  D 00237 02644 $
1462                B      ERRCTL           RETURN         7  03375  J 02670
1463      CNTERR    SBR    X6               STORE RETURN ADDR  7  03382  G 00054 B
1464                A      @7@,X6           UPDATE RETURN ADDR  11  03389  A 08977 00054
1465                Ch     ERRDSW&1         TURN OFF ERROR Sh  6  03400  ¤ 02948
1466                B      UPIX&1S                         7  03406  J 03432
1467      UPIX      SBR    X6               STORE RETURN ADDR  7  03413  G 00054 B
1468                MLCS   @ @,C&X5         REMOVE STATUS CHAR  12  03420  D 08969 00¢¢0 3
1469                A      @2@,X5           UPDATE IND REG 5  11  03432  A 08983 00049
1470                B      0&X6             RETURN TO PROGRAM  7  03443  J 00¢.0
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ACCRS  INSTRUCTION

1472      CTLFLG    ECU    201
1473                PST
```

```
PGLIN     LABEL     OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION

1475
1476                DETERMINE WHICH CHANNEL TO USE
1477
1478      START     CW     DEVAC,CUT&1          TURN        11  03450  M 08832 05801
1479                CW     NOGOOD&1,LAST2&1        OFF      11  03461  M 06059 06563
1480                CW     PAS2SW&1,FILE&4            SWITCHES 11  03472  M 07114 09895
1481                CW     SURFSW&1,FLGING&1                   11  03483  M 06588 05210
1482                CW     NOGO&1                              6   03494  M 07809
1483                MLCA   @OOO,FILE&1          RESET ACCESS & MOD 12  03500  D 08985 09892 I
1484                SW     FILE&1                              6   03512  , 09892
1485                S      TRKCNT               RESET TRCK COUNT 6   03518  S 08881
1486                B      TYP1                                7   03524  J 01593
1487                CCW    @TURN ON MAG & CE-WRT SW@,0         23  03553
1488                W                           WAIT FOR ACTION 1   03555
1489                ZA     @OOOOO@,X15          LOAD IX 15     11  03556  M 08989 00099
1490                ZA     @13328,X14           LOAD IX 14     11  03567  M 08993 00094
1491      ONE       BCE    *&&,0&X14,F          BRCH IF FILES AVAIL 12  03578  B 03597 00M.0 F
1492                B      UPX15                               7   03590  J 03719
1493                MLCA   CODE3&X15,TSTCH      MOVE CHANNEL CODES 12  03597  D 081E4 03628 I
1494                B      CHALTR               GO TO CHANNEL ALTER 7   03609  J 01045
1495                CCW    TOP                  TOP LIMIT      5   03620  08825
1496                CC     BOTTOM-1             LOW LIMIT      5   03625  03628
1497                CCW                         CHANNEL        1   03626
1498                CC                                CODES    1   03627
1499      TSTCH     CC     @ @                                 1   03628
1500      BOTTOM    SC     1,FILE               TEST FOR READY FILE 10  03629  M 8F0 09891 R
1501                BAI    *&1                                 7   03639  R 03646 M
1502                BNR1   *&&                  BRCH NOT READY  7   03646  R 03660 1
1503                B      RIGHT1                              7   03653  J 03760
1504      UP1       A      @1@,FILE             UPDATE ACCESS ADDRESS 11  03660  A 08970 09891
1505                BCE    BOTTOM,FILE,1        BRCH IF NOT ACCESS OVERFLOW 12  03671  B 03629 09891 1
1506                S      @2@,FILE             RESET ACCESS   11  03683  S 08983 09891
1507                A      @1@,FILE&1           UPDATE MODULE ADDRESS 11  03694  A 08970 09892
1508                BZ     *&&                  BRCH IF ALL MOD TRIC 7   03705  J 03719 V
1509                B      BOTTOM                              7   03712  J 03629
```

INITIALIZE ROUTINE

```
PGLIN   LABEL    OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1510    LPX15    A      @3@,X15          UPDATE IX 1K            11  03719  A 08976 00099
1511             A      @57@,X14         UPDATE IX 14            11  03730  A 08995 00094
1512             BCE    ENDTST,X15-1,1   BRCH IF ALL MOD CHKD     12  03741  B 08742 00098 1
1513             B      ONE                                       7  03753  J 03578
1514    RIGHT1   MLNS   FILE&1,RDYMES&16 MOVE MODULE ADDRESS      12  03760  D 09892 03830 1
1515             MLNS   FILE,RDYMES&1C   MOVE ACCESS ADDRESS      12  03772  D 09891 03824 1
1516             MLNS   TSTCH,RDYMES&21  MOVE CHANNEL ADDRESS     12  03784  D 03628 03835 1
1517             CW     OFFON&1,CNOFF&1  CLEAR PATTERN SWITCHES    11  03796  ¤ 05819 06075
1518             B      TYP2             GO TYPE MESSAGE           7  03807  J 01607
1519    RDYMES   CCW    @TSTNG ACC   MOD CH  @,G                  22  03814
1520             CCW    @ @,G            REPLY AREA              1  03837
1521             BCE    FOUND1,*-13,1    BRCH IF THIS ONE IS     12  03839  B 03858 03837 1
1522             B      UP1                  TO BE TESTED          7  03851  J 03660
1523
1524          PREPARE PROG TO RUN UNDER MODE SELECTED
1525
1526    FOUND1   B      TYP2                                      7  03858  J 01607
1527             CCW    @SEL MODE@,G                              8  03872
1528    MODE     CCW    @N   @,G                                  5  03874
1529             SW     MODE&1,FILE&2                            11  03880  , 03875 09893
1530             MLCWA  MODE&4,FILE&5     LOAD ADDRESS           12  03891  D 03878 09896 X
1531             MLCWA  MODE&4,LOEND      SAVE STARTING ADDRESS  12  03903  D 03878 08885 X
1532             MLCWA  MODE&4,LIMIT      SET FILE ADDRESS LIMIT 12  03915  D 03878 08806 X
1533             BCE    CECYL,MODE&2,#    BRCH IF CE CYL SELECTED 12  03927  B 04458 03876 #
1534             MLCA   LOEND,SAFETY&32   MOVE STARTING ADDR      12  03939  D 08885 04087 T
1535             B      TYP2                                      7  03951  J 01607
1536             CCW    @YOU HAVE SELECTED TO OPERATE ON CUSTOMER TRACKS @   48  04005
1537             CC     @THIS CAN RESULT IN THE LOSS OF CUSTOMER DATA.THE @  49  04054
1538    SAFETY   CC     @STARTING ADDRESS SELECTED IS      .ENTER Y.S OR N.S IF @  47  04055
1539             CC     @THIS IS CORRECT@,G                      15  04116
1540             CCW    @   @,G                                   3  04120
1541             C      *-12,INTLOK                              11  04122  C 04120 08935
1542             BE     SOUND                                     7  04133  J 04202 S
1543    ALARM    B      TYP1                                      7  04140  J 01593
1544             CCW    @SELECTION ERROR,SAFETY INTERLOCK CAUSES RESTART@,G  47  04193
```

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1545		B	START		7	04195	J 03450
1546	SCUNC	BBE	ALARM,MODE&4,&	CHECK FOR ZONE	12	04202	W 04140 03878 &
1547		BBE	ALARM,MODE&3,&		12	04214	W 04140 03877 &
1548		BBE	ALARM,MODE&2,&		12	04226	W 04140 03876 &
1549		BBE	ALARM,MODE&1,&		12	04238	W 04140 03875 &
1550		BCE	ALARM,MODE&4,	CHECK FOR MISSED CHARACTERS	12	04250	B 04140 03878
1551		BCE	ALARM,MODE&3,		12	04262	B 04140 03877
1552		BCE	ALARM,MODE&2,		12	04274	B 04140 03876
1553		BCE	ALARM,MODE&1,		12	04286	B 04140 03875
1554		BZN	CHKCYL,MODE,-	BRCH IF USING TRACK	12	04298	V 045C6 03874 K
1555		BZN	CHKTRK,MODE,*	BRCH IF USING SURFACE	12	04310	V 04415 03874 S
1556		BCE	*&&,MODE&4,0	CHECK FOR 0 IN UNITS POSITION	12	04322	B 04341 03878 0
1557		B	ALARM		7	04334	J 04140
1558		BBE	ALARM,MODE&3,1	ENTRY ERROR GO TO ALARM	12	04341	W 04140 03877 1
1559		BCE	ODDCHK,MODE&3,2	FURTHER CHECK OF ADDR	12	04353	B 04396 03877 2
1560		BCE	ODDCHK,MODE&3,&		12	04365	B 04396 03877 &
1561		BBE	ALARM,MODE&2,1	ENTRY ERROR GO TO ALARM	12	04377	W 04140 03876 1
1562		B	CHKCYL		7	04389	J 045C6
1563	CDDCHK	BBE	CHKCYL,MODE&2,1		12	04396	W 045C6 03876 1
1564		B	ALARM		7	04408	J 04140
1565	CHKTRK	C	MODE&4,@CC39@		11	04415	C 03878 08999
1566		BL	ALARM	ENTRY ERROR GO TO ALARM	7	04426	J 04140 T
1567		C	MODE&4,@CCCC@		11	04433	C 03878 08989
1568		BH	ALARM		7	04444	J 04140 U
1569		B	CHKCYL		7	04451	J 045C6
1570	CECYL	SW	FILE&4,LCEND-1		11	04458	, 09895 08884
1571		SW	LIMIT-1		6	04469	, 08835
1572		MLCA	@9#6C@,LIMIT	RESET LIMITS	12	04475	D 09CC3 08836 T
1573		MLCA	@9#2C@,LCEND		12	04487	D 09007 08885 T
1574		B	CKCPT		7	04499	J 046C3
1575	CHKCYL	BZN	CYL,MODE,&		12	045C6	V 04561 03874 B
1576		BZN	TRCK,MODE,-	BRCH IF USING TRACK	12	04518	V 04592 03874 K
1577		BZN	SURF,MODE,*		12	04530	V 04579 03874 S
1578		MLNA	@CCCC@,LIMIT	SET FILE ADDR LIMIT	12	04542	D 08989 08836 /
1579		B	CKCPT		7	04554	J 046C3
1580	CYL	A	@4C@,LIMIT	SET LIMIT	11	04561	A 09009 08836

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PGLIN   LABEL   CPCCC  OPERAND                                  CT  ADDRS  INSTRUCTION
1581            B      CKOPT                                     7  04572  J 04603
1582    SURF    SW     SURFSW&1          SET SWITCH TO TEST ONE SWITCH  6  04579  , 06588
1583            B      CKCPT                                     7  04585  J 04603
1584    TRCK    A      @16,LIMIT         DETERMINE HIGH LIMIT   11  04592  A 08970 08836
1585    CKCPT   PLNS   MODE,OPTNSW       STORE OPTION SELECTC   12  04603  D 03874 08844 1
1586            BCE    CESWCN,OPTNSW,1   WILL HAI BE WRITTEN    12  04615  B 07004 08844 1
1587            BW     INTXIT,CEHAD      BRCH IF CE SWITCH WAS TURNED ON  12  04627  V 04889 08832 1
1588            BCE    CESWCN,OPTNSW,4   WILL HAI BE WRITTEN    12  04639  B 07C04 08844 4
1589            BCE    HACFF,OPTNSW,2    BRCH IF VERIFY ACCR ONLY  12  04651  B 04834 08844 2
1590            B      TYP1                                      7  04663  J 01593
1591            CCW    @TURN ON FORMAT SW FOR ACC & MCD BEING TESTED@,G  44  04713
1592            H                                                1  04715  .
1593            B      TYP2                                      7  04716  J 016C7
1594            CCW    @SELECT PATTERNS ENTER 1 TC USE V & ',2 TO USE V,3 @  50  04772
1595            CC     @TC USE '@,G                              8  04780
1596    PS      CCW    @ @,G                                     1  04782
1597            BCE    INTXIT,PS,1       BRCH IF USING BOTH PATTERNS  12  04784  B 04889 04782 1
1598            BCE    *&14,PS,2         BRCH IF USING V PATTERN  12  04796  B C4821 04782 2
1599            SW     OFFON&1           TURN ON BYPASS V SWITCH   6  04808  , 05819
16C0            B      INIXIT                                    7  04814  J 04889
16C1            SW     ONOFF&1           TURN ON BYPASS - SWITCH   6  04821  , 06075
16C2            B      INIXIT                                    7  04827  J 04889
16C3    HACFF   B      TYP1                                      7  04834  J 01593
16C4            CCW    @INSURE CE-HAD SW IS OFF@,G              23  04863
16C5            H                        WAIT FOR ACTION         1  04865  .
16C6            ZA     ONE1,X3           LOAD IX 3              11  04866  M 09014 00039
16C7            BCE    SUPCRE,LCEND-2,8  BRCH IF TESTING CE-CYL  12  04877  B 06759 08883 8
16C8    INTXIT  B      MONITR            GO TC MONITOR           7  04889  J 02101
16C9
```

```
PGLIN     LABEL     OPCDE  OPERAND                                  CT  ADDRS  INSTRUCTION
1611                        *** TEST ROUTINE DESCRIPTION ***
1612                          *** POSITION THE ACCESS ***
1613              THIS ROUTINE SEEKS THE ACCESS TO THE LATEST TRACK AND HEAD ADDR
1614            BEING USED,IT SHOULD BE POINTED OUT THAT THIS ROUTINE IS BYPASSED
1615            WHEN THE ACCRESS CHANGE DOES NOT REQUIRE THE ACCESS TO BE MOVED.
1616            AFTER THE SEEK OPERATION A READ HAC IS ISSUED,THIS READ IS GIVEN
1617            ONLY IF THE CE-HAC SWITCH IS OFF,IF THE READ OP RESULTS IN A
1618            NO RECORD FOUND,ERROR 1 IS INDICATED.ALL STATUS ERRORS ARE ALSO
1619            INDICATED.
1620
1621      A01   NOP                                                1  04896  N
1622            CC      8012              ROUTINE INDENT           2  04898
1623            SC      1,FILE            POSITION THE ACC        10  04899  M 8F0 09891 R
1624            BC81    *-16                                       7  04909  R 04899 2 G
1625            BA1     STACHK            BRCH ON ANY ERROR        7  04916  R 03136 M
1626            B4      A01XIT,CEHAC      BRCH IF CE-HAC IS ON    12  04923  V 04979 08832 1
1627            LC      8F5,FILE,R        VERIFY THAT ACC HAS     10  04935  L 8F5 09891 R
1628            BC81    *-16              ARRIVED AT THE           7  04945  R 04935 2 G
1629            BA1     *E1               CORRECT ADDR             7  04952  R 04959 M
1630            BEX1    *EE,Y             BRCH EXT COND CR NT      7  04959  R 04973 Y
1631            B       A01XIT                                     7  04966  J 04979
1632                      *** SET ERROR 1 ON ***
1633            S4      E1                SET ERROR 1 ON           6  04973  , 01802
1634          ACCESS POSITIONED INCORRECTLY,READ OP CAUSES NO RECORD FOUND.
1635      A01XIT  B       MONITR                                     7  04979  J 02101
1636
```

```
PGLIN    LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
1638                       *** TEST ROUTINE DESCRIPTION ***
1639                    *** WRITE MAXIMUM LENGTH FORMAT IN 8 BIT MODE ***
1640              THIS ROUTINE WRITES A FORMAT IN 8 BIT MODE EACH TIME A NEW
1641             CYLINDER IS BEGUN.IF THE PROGRAM IS BEING RUN IN THE VERIFY ADDR
1642             MODE ONLY THIS ROUTINE IS COMPLETELY BYPASSED.AFTER THE FORMAT IS
1643             WRITTEN IT IS WRITE CHECKED,IF THIS RESULTS IN A DATA CHECK,ERROR
1644             2 IS INDICATED.ALL STATUS ERRORS ARE ALSO INDICATED.
1645
1646             FORMAT WRITTEN IN 8 BIT MODE
1647             4444443333333333333333333333334 HA2 CONSISTS OF 4585 CHARACTERS
1648
1649             FORMAT ORGANIZATION
1650             GAP1--HA1--GAP3--HA2 4585 CHARS--GAP3
1651
1652    NC2      NOP                                                         1  04986  N
1653             CC       8028              ROUTINE IDENT                  2  04988
1654             BCE      NC2XIT,OPTNSW,2   IS FORMAT BEING WRTN           12  04989  B 05199 08844 2
1655             BCE      NC2XIT,MODE,/     BRCH IF RESTORING A SURFACE    12  05001  B 05199 03874 /
1656             BCE      NC2XIT,MODE,J     BRCH IF RESTORING ONE TRACK    12  05013  B 05199 03874 J
1657             BCE      NC2XIT,MODE,A     BRCH IF RESTORING ONE CYLINDER 12  05025  B 05199 03874 A
1658             SW       DATAFD                                            6  05037  , 099CC
1659             ZA       ADDR1,X1C         LOAD IX 1C                     11  05043  M 08940 00074
1660    CLRFLD   CS       0&X1C             CLEAR THE DATA FLD              6  05054  / 00..0
1661             STR       X1C              STORE ADDR REG                 7  05060  G 00074 8
1662             BW       CLRFLD,DATAFD     MORE TO CLEAR                  12  05067  V 05054 099CC 1
1663             SW       DATAFD&4617       PREPARE TO LOAD                 6  05079  , 14517
1664             MLCS     838,DATAFD           DATA FIELD                  12  05085  D 08976 099CC 3
1665             MRN      DATAFD,DATAFD&1   MOVE IN HA1 FORMAT             12  05097  D 099CC 099C1 9
1666             MLCS     848,DATAFD&4618   SET IN LAST GAP                12  05109  D 09015 14518 3
1667             MLCA     HAAREA,DATAFD&32  MOVE IN HA1 FORMAT             12  05121  D 08877 09932 1
1668             MLCWS    8M8,DATAFD&4615   SET TERMINATING WMGM           12  05133  D 08968 14519 7
1669             WU       8F7,FILE,W        WRITE THE FORMAT               10  05145  M 8F7 09891 W
1670             BCBI     *-16                                              7  05155  R 05145 2
1671             BAI      STACHK            BRCH ON ANY ERROR              7  05162  R 03136 M
1672             WCC      1,FILE            WRITE DISK CHECK               10  05169  M 8F3 09891 W
```

```
                    WRITE FORMAT FOR MAXIMUM LENGTH
PGLIN     LABEL     CPCCD  OPERANC                                    CT  ACCRS  INSTRUCTION
1673                BAL    *68                BRCH ON ANY ERRCR        7  05179  R 05193 G
1674                B      NC2XIT                                      7  05186  J 05199 M
1675                    *** SET ERRCR 2 CN ***
1676                SW     E2                                          6  05193  . 01803
1677          WRITE CHECK CF FORMAT RESULTS IN DATA CHECK
1678      NC2XIT    B      MCNITR                                      7  05199  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1680                       *** TEST ROUTINE DESCRIPTION ***
1681                    *** WRITE THE HOME ADDRESS 1 AND CHECK IT ***
1682          WHEN THE WRITE ADDRESS MODE IS BEING USED AND THE CE-MAC SWITCH
1683        IS ON THIS ROUTINE WRITES MA1&2.THE ROUTINE ASSUMES THE ACCESS IS
1684        PROPERLY POSITIONED FOR WRITTING THE ADDRESS,AFTER WRITTING MAC
1685        A READ MAC BRINGS THE WRITTEN MA1 BACK INTO MEMORY.THE ADDRESS
1686        READ IS CHECKED IN MEMORY,IF IT DOESN T COMPARE WITH THE ADDRESS
1687        WRITTEN ERROR 3 IS INDICATED.STATUS ERRORS WILL ALSO BE INDICATED
1688
1689        FORMAT REQUIRED IS THE SAME AS DESCRIBED IN ROUTINE NO2
1690
1691        DATA FIELD USED  WRITE AND READ IN 8 BIT MODE
1692        00CC888    THE FIRST 4 ZEROS ARE MA1,THE FIRST 8 BIT IS THE FLAG
1693
1694      NO3       NOP                                              1  05206  N
1695                CC        8038          ROUTINE IDENT            2  05208
1696      FLGING    NOPMM                                            1  05209  N
1697                B         WFCOUN        RETURN TO FLAGGING ROUTINE  7  05210  J 07306
1698                BBE       NO3XIT,OPTNSW,2   IS ROUTINE USED      12  05217  W 05533 08844 2
1699                BCE       NO3XIT,OPTNSW,8   IS ROUTINE USED      12  05229  B 05533 08844 8
1700                BM        *&&,CE-MAC    IS CE-MAC SW ON          12  05241  V 05260 08832 1
1701                B         NO3XIT                                 7  05253  J 05533
1702                SW        DATAFD                                 6  05260  ? C99C0
1703                ZA        ADDR1,X1C     LOAD IX 1C               11  05266  M 08940 00074
1704      CLRSTC    CS        0&X1C         CLEAR STORAGE            6  05277  / 00..0
1705                SBR       X1C                                    7  05283  G 00074 B
1706                BM        CLRSTC,DATAFD                          12  05290  V 05277 C99C0 1
1707                MLCMS     8M8,DATAFD&4583   SET TERMINATING MMGM  12  05302  D 08968 14483 7
1708                MLCM      8888,FILE&7   RESET MA2                12  05314  C 09017 09898 1
1709                MRCG      FILE&2,DATAFD MOVE ADDR TO DATAFD      12  05326  D 09893 C99C0 8
1710                MLCS      888,DATAFD&6  MOVE IN MA2 CHAR         12  05338  D 09018 C99C6 3
1711                CW        WLR&1         TURN OFF WLR CHECK       6  05350  @ 03316
1712                LL        8F5,FILE,W    WRITE HOME ADDR          10  05356  L 8F5 09891 W
1713                BCB1      *-16                                   7  05366  R 05356 2
1714                BA1       *&1                                    7  05373  R 05380 M
```

```
                    WRITE THE HOME ADDR & CHECK IT
PGLIN     LABEL     OPCOD  OPERAND
1715                BEX1   STACHK,S M        BRCH ANY BLT WLR
1716                SW     DATAFD
1717                ZA     ADDR1,X1C
1718      CLRST1    CS     0&X1C             CLEAR DATA FIELD
1719                SER    X1C
1720                BW     CLRST1,DATAFD
1721                MLCWS  @MG,DATAFD&4583   SET TERMINATING WMGM
1722                LL     %F5,FILE,R        READ THW HOME ADDR
1723                BAI    *&1
1724                BCE    *&&,OPTNSW,1      BRCH IF WRITTING HAI
1725                B      *&20
1726                BCE    *&&,MODE,1        BRCH IF WRITING ENTIRE MODULE
1727                B      *&&
1728                BEX1   STACHK,S M        BRCH ANY BLT WLR
1729                SW     WLR&1             TURN ON WLR CHECK
1730                C      DATAFD&5,FILE&7   IS THE ADDR GOOD
1731                BE     *&7               IF TI SI BRCH
1732                     *** SET ERROR 3 ON ***
1733                SW     E3                TURN ON ERROR
1734          ADDRESS READ BACK DOES NOT COMPARE TO ADDRESS WRITTEN
1735      NO3XIT    B      MONITR
1736
```

```
CT  ADDRS  INSTRUCTION
 7  05380  R 03136 S M
 6  05387  , 09900
11  05393  M 08940 00074 G
 6  05404  / 00..0
 7  05410  C 00074 B
12  05417  V 05404 09900 1
12  05429  C 08968 14483 7
10  05441  L %F5 09891 R
 7  05451  R 05458 G M
12  05458  B 05477 08844 1
 7  05470  J 05496
12  05477  B 05496 03874 1
 7  05489  J 05503
 7  05496  R 03136 S M
 6  05503  , 03316
11  05509  C 09905 09898
 7  05520  J 05533 S
 6  05527  , 01804
 7  05533  J 02101
```

```
PGLIN    LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1738                        *** TEST ROUTINE DESCRIPTION ***
1739                      *** USE BLANKS TO ANALYZE SURFACE ***
1740                 THIS ROUTINE WRITES A MAXIMUM RECORD OF BLANKS IN THE 8 BIT
1741                 MODE,THE RECORD ACTUALLY BEING THE MA2 AREA,THE RECORD IS READ
1742                 BACK AND CHECKED IN MEMORY.IF THE RECORD IS NOT ALL BLANKS THE
1743                 PROGRAM BRANCHES TO ROUTINE NO7 WHERE EACH CHARACTER IS CHECKED
1744                 UNTIL THE FAILING CHARACTER IS LOCATED.THE PROGRAM RETURNS TO
1745                 THIS ROUTINE AND THE RECORD IS WRITTEN AND READ AGAIN.IF THE READ
1746                 DATA IS GOOD ON THE 2ND PASS ERROR 5 IS INDICATED,THIS WOULD BE A
1747                 SOFT ERROR AND DOES NOT INDICATE A DEFECTIVE SURFACE.IF THE 2ND
1748                 PASS READ DATA IS BAD,THE PROGRAM ONCE MORE BRANCHES TO ROUTINE
1749                 NO7 FOR A CHARACTER BY CHARACTER CHECK.IF THE FAILING CHARACTER
1750                  LOCATION IN RECORD  IS THE SAME AS THE FIRST PASS,ERROR 4 IS
1751                 INDICATED.THIS WOULD BE A SOLID ERROR AND A STRONG INDICATION OF
1752                 A DEFECTIVE TRACK.IF THE FAILING CHARACTER IS NOT THE SAME AS THE
1753                 FIRST PASS ERROR 5 WOULD BE INDICATED.ALL STATUS ERRORS BUT WRONG
1754                 LENGTH RECORD WILL ALSO BE INDICATED.
1755                 FORMAT REQUIRED IS THE SAME AS DESCRIBED IN ROUTINE NO2
1756
1757                 DATA FIELD USED IN 8 BIT MODE
1758                 4585 BLANKS,THE ENTIRE FIELD IS MA2
1759
1760
1761                      PART I USE BLANKS TO ANALYZE SURFACE
1762
1763      NO4        NOP
1764                 DC       @04@                  ROUTINE IDENT                    1  05540  N
1765                 BCE      NO6XIT,OPTNSW,1       IS THIS ROUTINE USED             2  05542
1766                 BCE      NO6XIT,OPTNSW,2       IS THIS ROUTINE USED            12  05543  B 06320 08844 1
1767                 BB       NO6XIT,CEMAC          IS THE CE-MAC SW ON             12  05555  B 06320 08844 2
1768                 B        NO4XIT                BYPASS THIS ROUTINE             12  05567  V 06320 08832 1
1769                 CB       WLR61                 TURN OFF WLR CHECK               7  05579  J 05808
1770      IN         SW       DATAFD                                                 6  05586  ¤ 03316
1771                 ZA       ADDR2,X1C             LOAD IX 1C                       6  05592  & 099C0
1772      CLEAR      CS       0&X1C                 CLEAR                           11  05598  M 08945 00074
                                                                                     6  05609  / 0C..0
```

```
PGLIN  LABEL   OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1773           SBR    X1C                  CLT                 7  05615  G 00074 B
1774           BW     CLEAN,DATAFD           THE DATA FLD     12  05622  V 05609 09900 1
1775           MLCWS  2MG,DATAFD&4576       SET TERMINATING WMGP 12  05634  D 08968 14478 7
1776           MLCS   2 2,TSTBIT           SAVE THE TST BIT    12  05646  D 08969 08879 3
1777           LU     %F5,FILE,W           WRITE HA2 FULL TRACK 10  05658  L %F5 09891 W
1778           BCB1   *-16                                      7  05668  R 05658 2
1779           BA1    *&1                                       7  05675  R 05682 GM
1780           BEX1   STACHK,SM            BRCH ANY BLT WLR    7  05682  R 03136 SM
1781  MARK3    LU     %F5,FILE,R           READ HA2 & FULL TRACK 10 05689  L %F5 09891 R
1782           BA1    *&1                                       7  05699  R 05706 GM
1783           BEX1   STACHK,SM            BRCH ANY BLT WLR    7  05706  R 03136 SM
1784           SW     DATAFD,WLR&1                             11  05713  , 09900 03316
1785           C      DATAFD&4577,DATAFD&4576                  11  05724  C 14477 14476
1786                CHECK THE DATA FLD IN MEMORY
1787           BE     FIRST                IF FLD IS OK BRCH   7  05735  J 05769 S
1788           B      CHARCK               GO TO CHAR CHECK    7  05742  J 07045
1789           B      MARK3                                    7  05749  J 05689
1790                *** SET ERROR 4 ON ***
1791           SW     E4                   TURN ON ERROR IND   6  05756  , 01805
1792     ON 2 PASSES THE SAME CHARACTER LOCATION FAILED,PROBABLY DEFECTIVE
1793     SURFACE
1794           B      OUT                                      7  05762  J 05800
1795  FIRST    BW     *&8,PAS2SW&1         BRCH IF SECOND PASS 12  05769  V 05788 07114 1
1796           B      OUT                                      7  05781  J 05800
1797           CW     PAS2SW&1             TURN OFF PASS SW    6  05788  ¤ 07114
1798                *** SET ERROR 5 ON ***
1799           SW     E5                   TURN ON ERROR IND   6  05794  , 01806
1800     CHARACTER LOCATION FAILED ONCE ON TWO PASSES
1801  CLT      NOPWM                                           1  05800  N
1802           B      BACKON                                   7  05801  J 07771
1803  NO4XIT   B      MONITR                                   7  05808  J 02101
1804
1805              PART II USE V TO ANALYZE SURFACE
1806
1807              *** TEST ROUTINE DESCRIPTION ***
```

```
1808                *** USE WORD MARK V TO ANALYZE SURFACE ***
1809          THIS ROUTINE FUNCTIONS IN THE SAME WAY AS ROUTINE NC4 EXCEPT
1810          WORD MARK V IS USED. SINCE WORD MARKS ARE USED IT IS
1811          VERY DIFFICULT TO CHECK THE DATA IN MEMORY SO A WRITE DISK CHECK
1812          IS USED TO CHECK THE DATA WRITTEN.IF A DATA CHECK RESULTS THEN
1813          THE RECORD IS READ BACK INTO MEMORY AND A CHARACTER BY CHARACTER
1814          CHECK IS MADE.THE LOCATION OF THE FAILING CHARACTER IS SAVED AND
1815          THE ROUTINE IS REPEATED.ON THE 2ND PASS IF THE WRITE CHECK DOES
1816          NOT FAIL,OR IF IT DOES BUT THE FAILING CHARACTER LOCATION IS NOT
1817          THE SAME AS THE FIRST PASS,ERROR 7 IS INDICATED.IF ON THE 2ND
1818          PASS A FAILURE OF SAME CHARACTER LOCATION OCCURES,ERROR 6 IS
1819          INDICATED,THIS BEING THE SOLID ERROR.ALL STATUS ERRORS WILL ALSO
1820          BE INDICATED.
1821
1822          FORMAT REQUIRED IS THE SAME AS DESCR2BED TO ROUTINE NC2
1823
1824          DATA FIELD USED 8 BIT MODE
1825          4585 WORD MARK V,WRITTEN AS HA2
1826
1827    NC5       NOP
1828              CC      @C5@                ROUTINE IDENT
1829    OPFCN     NOPWM
1830              B       NC5XIT              BYPASS
1831              CW      WLRG1               TURN OFF WLR CHECK
1832    GETRCY    ZA      ADDR2,X1C           LOAD IX 1C
1833              SW      DATAFD
1834    CLEAN3    CS      0&X1C               CLEAR
1835              SBR     X1C                     THE
1836              BW      CLEAN3,DATAFD            DATA
1837              SW      DATAFD                    FIELD
1838              MLCWS   @V@,DATAFD&4577     LOAD THE
1839              MLCWB   DATAFD&4577,DATAFD&4576      DATA FIELD
1840              MLCWS   @V@,TSTBIT          SAVE THE TEST BIT
1841              MLCWS   @M@,DATAFD&4576     SET TERMINATING WMGM
1842              LU      %F5,FILE,W          WRITE HA2 FULL TRCK
```

```
 1  05815  N
 2  05817
 1  05818  N
 7  05819  J 06064
 6  05826  ¤ 03316
11  05832  M 08945 00074
 6  05843  , 09900
 6  05849  / CC..0
 7  05855  G 00074 8
12  05862  V 05849 09900 1
 6  05874  , 09900
12  05880  D 09019 14477 7
12  05892  D 14477 14476 P
12  05904  D 09019 08879 7
12  05916  D 08968 14478 7
10  05928  L %F5 09891 W
```

```
PGLIN   LABEL   ANALYZE DISK SURFACE FOR DEFECTS
                OPCOD  OPERAND

1843            BAL    *&1
1844            BEXI   STACHK,S,M
1845    WRTCHK  LL     %F3,FILE,W          BRCH ANY BUT WLR
1846                                       WRITE DISK CHECK
1847            BAL    *&1
1848            BEXI   STACHK,,            BRCH ON ANY BUT DC
1849            BER1   *&&                 BRCH ON DATA CHECK
1850            B      NOSXIT
1851    MARK2   S      TENCNT
1852            LL     %F3,FILE,W          WRITE CHECK FOR 2ND ERROR
1853            BAL    *&1
1854            BER1   NOGOOD              BRCH ON DATA CHECK
1855            A      &1&,TENCNT          COUNT TEN PASSES
1856            BZ     SOFT                BRCH AFTER TEN PASSES
1857            B      MARK2&&             GO TRY AGAIN
1858          *** ERROR 7 ***
1859    SOFT    SW     E7                  TURN ON ERROR INDICATE
1860      WOO FAILED ONE TIME ON FIRST TRY,THIS IS CONSIDERED A SOFT ERROR
1861            B      NOSXIT
1862          *** ERROR 6 ***
1863    NOGOOD  SW     E6                  TURN ON ERROR INDICATE
1864      WOO FAILED TWICE,THIS IS CONSIDERED A HARD ERROR AND THE TRACK
1865      SHOULD BE FLAGGED
1866    NOSXIT  B      MONITR
1867
1868                PART III USE - TO ANALYZE SURFACE
1869
1870              *** TEST ROUTINE DESCRIPTION ***
1871            *** USE - TO ANALYZE SURFACE ***
1872      THIS ROUTINE IS THE SAME AS ROUTINE NO4 EXCEPT THAT   IS USED
1873    INSTEAD OF BLANK.SOFT ERRORS ARE INDICATED BY ERROR 9,AND TWO
1874    SUCCESSIVE CHARACTER LOCATION FAILURES ARE INDICATED BY ERROR 8.
1875    FOR GREATER DETAIL CHECK ROUTINE NO4 DESCRIPTION.
1876
1877    FORMAT REQUIRED IS THE SAME AS DESCRIBED IN ROUTINE NO2
1878
        DATA FIELD USED
```

```
CT  ADDRS  INSTRUCTION
 7  05938  R 05945 G,M
 7  05945  R 03136 S,M
10  05952  L %F3 09891 W
 7  05962  R 05969 G,M
 7  05969  R 03136 ,
 7  05976  R 05990 4
 7  05983  J 06064
 6  05990  S 08951
10  05996  L %F3 09891 W
 7  06006  R 06013 G,M
 7  06013  R 06058 4
11  06020  A 08970 08951
 7  06031  J 06045 V
 7  06038  J 05996

 6  06045  , 01808

 7  06051  J 06064

 6  06058  , 01807


 7  06064  J 02101
```

```
PGLIN   LABEL    OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1879        4578 -,WRITTEN AS WA2
1880
1881    NC6      NOP                                               1  06071  N
1882             DC     @C6@              ROUTINE IDENT           2  06073
1883    CNOFF    NOPWM                                             1  06074  N
1884             B      NC6XIT            BY-PASS THIS ROUTINE    7  06075  J 06320
1885             CW     WLR61             TURN OFF WLR CHECK      6  06082  C 03316
1886    GETSET   ZA     ADDR2,X1C         LOAD IX 1C             11  06088  M 08945 00074
1887             SW     DATAFD            CLEAR                   6  06099  , 09900
1888    CLEAN5   CS     06X1C                 THE                 6  06105  / 00..0
1889             SBR    X1C                     DATA              7  06111  G 00074 B
1890             BW     CLEAN5,DATAFD             FIELD           12  06118  V 0610C 09900 1
1891             SW     DATAFD                                    6  06130  , 09900
1892             MLCS   @.@,DATAFD6457T   LOAD                   12  06136  D 09020 14477 3
1893             MLCB   DATAFD6457T,DATAFD6457E                  12  06148  D 14477 14476 L
1894             MLCS   @.@,TSTBIT        SAVE                   12  06160  D 09020 08879 3
1895             MLCWS  @M@,DATAFD6457E   SET TERMINATING WAGM    12  06172  D 08968 14478 7
1896             LC     %F5,FILE,W        WRITE WA2 FULL TRK     10  06184  L %F5 09891 W
1897             BAI    *61                                       7  06194  R 06201 M
1898             BEX1   STACHK,S          BRCH ANY BUT WLR        7  06201  R 03136 M
1899             LC     %F3,FILE,W        WCC THE DATA PATTERN   10  06208  L %F3 09891 W
1900             BAI    *61                                       7  06218  R 06225 M
1901             BEX1   STACHK,,          BRCH ON ANY BUT DATA CHECK  7  06225  R 03136 ,
1902             BER1   *6E               BRCH ON DATA CHECK      7  06232  R 06246 4
1903             B      NC6XIT                                    7  06239  J 06320
1904    MARK     S      TENCNT            RESET COUNTER           6  06246  S 08951
1905             LC     %F3,FILE,W        WRITE CHECK FOR 2ND ERROR  10  06252  L %F3 09891 W
1906             BAI    *61                                       7  06262  R 06269 M
1907             BER1   NUCNIC           BRCH ON DATA CHECK      7  06269  R 06314 4
1908             A      @1@,TENCNT        COUNT TEN PASSES       11  06276  A 08970 08951
1909             BZ     SOFTIE            BRCH AFTER 10           7  06287  J 063C1 V
1910             B      MARK66            TRY AGAIN               7  06294  J 06252
1911            *** ERROR 9 ***
1912    SOFTIE   SW     E9                TURN ON ERROR IND       6  063C1  , 01810
1913      WCC FAILED ONE TIME ON FIRST TRY,THIS IS CONSIDERED A SOFT ERROR
```

```
PGLIN     LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION
1914                B      NO6XIT                                     7   06307  J 06320
1915                *** ERROR 8 ***
1916      NUCNIC    SW     E8                  TURN ON ERROR IND      6   06314  , 01809
1917        WCC FAILED TWICE,THIS IS CONSIDERED A HARD ERROR AND THE TRACK
1918        SHOULD BE FLAGGED
1919      NO6XIT    B      MONITR                                     7   06320  J 02101
```

```
PGLIN   LABEL    OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1921                       *** TEST ROUTINE DESCRIPTION ***
1922                    *** VERIFY THAT HA1 ADDRESSES ARE CORRECT ***
1923              WHEN RUNNING IN A MODE THAT USES THIS ROUTINE AND THE CE-HAD
1924             SWITCH IS OFF A READ HAD CP IS ISSUED.IF THE READ HAD CP RESULTS
1925             IN A NO RECORD FOUND,ERROR 1C IS INDICATED.IF THE ERROR OCCURS
1926             THE PROGRAM WILL REQUEST THE CE-HAD SWITCH BE TURNED ON,THE FAIL-
1927             ING ADDRESS IS THEN READ BACK INTO MEMORY AND DISPLAYED FOR
1928             ANALYSIS.ALL STATUS ERRORS ARE ALSO INDICATED.
1929
1930   NC8       NCP                                               1  06327  N
1931             DC        @08@                 ROUTINE IDENT      2  06329
1932             BCE       NC8XIT,OPTNSW,2      BRCH IF NOT USED  12  06330  B 06552 08844 3
1933             BN        NC8XIT,CEHAD         IS CE-HAD SW ON   12  06342  V 06552 08832 1
1934             ZA        ADDR2,X1C                              11  06354  M 08945 00074
1935             SW        DATAFD                                  6  06365  , 09900
1936   CLRST2    CS        0&X1C                CLER DATA FLD      6  06371  / 00..0
1937             SER       X1C                                     7  06377  G 00074 B
1938             BN        CLRST2,DATAFD                          12  06384  V 06371 09900 1
1939             MLCWS     2M@,DATAFD&4578      SET TERMINATING WMGM 12  06396  C 08968 14478 7
1940             LL        %F5,FILE,R           READ HA2 FULL TRK  1C  06408  L %F5 09891 R
1941             BCB1      *-16                                    7  06418  R 06408 2
1942             BA1       *&1                                     7  06425  R 06432 M
1943             BEX1      *&E,Y                BRCH ON NO-IR CR EC 7  06432  R 06446 Y
1944             B         NC8XIT                                  7  06439  J 06552
1945                          *** SET ERROR 1C ON ***
1946             SW        E1C                  TURN ON ERROR IND   6  06446  , 01811
1947          READ HAD RESULTS IN A NO RECORD FOUND
1948             BCE       *&E,SPTADD,1         BRCH IF IN MANUAL MD 12  06452  B 06471 01004 1
1949             B         NC8XIT                                  7  06464  J 06552
1950             B         MCHITR               GO INDICATE ADDR ERR 7  06471  J 02101
1951             B         CESWON                                  7  06478  J 07004
1952             MC        %F5,FILE,R           READ BACK ADDR     10  06485  M %F5 09891 R
1953             BA1       *&1                                     7  06495  R 06502 M
1954             SW        DATAFD                                  6  06502  , 09900
1955             MLCA      DATAFD&4,ADRMSG&16   MOVE FAILING ADDR 12  06508  D 09904 06543 T
```

```
PGLIN     LABEL     CPCCD  OPERAND                          CT  ADDRS  INSTRUCTION
1956                8      TYP1          GO TYPE MESSAGE     7  06520  J 01593
1957      ADRMSG    CCW    8HA1 READ IS  @,G                17  06527
1958                8      SWCFF         GO TURN OFF CE-HAC  7  06545  J 06965
1959      AC8XIT    8      MONITR                            7  06552  J 02101
1960
```

```
PGLIN     LABEL     OPCOD  OPERANC                                  CT  ADDRS  INSTRUCTION

1962                   *** TEST ROUTINE DESCRIPTION ***
1963                *** FILE ACCRESS UPDATE ROUTINE ***
1964          THIS ROUTINE UPDATES THE HA1 ADDRESS IN THE FILE ADDRESS,IT
1965        DETERMINES WHEN A CYLINDER HAS BEEN COMPLETED AND WHEN ALL OF THE
1966        CUSTOMER CYLINDERS HAVE BEEN COMPLETED.WHEN A CYLINDER IS
1967        COMPLETED AND THE NEXT CYLINDER MUST BE STARTED IT INSURES THAT
1968        THE POSITION ACCESS ROUTINE IS RUN.WHEN ALL CUSTOMER CYLINDERS
1969        HAVE BEEN COMPLETED IT SETS THE FILE ADDRESS FOR THE DIAGNOSTIC
1970        CYL.IN ADDITION THIS ROUTINE CHECKS WHEN THE PROGRAM IS COMPLETED
1971        ACCORDING TO THE MODE BEING RUN,1 TRACK,1 CYLINDER,THE ENTIRE MOD
1972        OR 1 SURFACE
1973      NO9       NOP
1974                CC      @09@              ROUTINE IDENT                1  06559  N
1975      LAST2     NOPWM                                                  2  06561
1976                B       TWO53             BRCH WHEN SW IS ON           1  06562  N
1977                SW      FILE@2                                         7  06563  J 06784
1978                ZA      @NO1,X3           LOAD IX 3                    6  06570  Q , 09893
1979      SURFSW    NOPWM                                                 11  06576  M 09014 00039
1980                B       UPSURF                                         1  06587  N
1981                A       A1@,FILE@5        UPDATE ADDR                  7  06588  J 06843
1982                C       FILE@5,LIMIT      LIMIT REACHED               11  06595  A 08970 09896
1983                BE      ANYMOR            IF SO BRCH                  11  06606  C 09896 08836
1984                A       A1@,TRKCNT        UPDATE TRCK CNT              7  06617  J 0669( S
1985                MRCHG   FILE,DATA         MOVE NEW ADDR               11  06624  A 08970 08881
1986                SW      EXTRA@1           TURN ON EXT DATA SW          12  06635  D 09891 0171C D L
1987                BCE     CYLCMP,TRKCNT-1,4 BRCH IF CYL COMPLETE          6  06647  , 03017
1988                ZA      @NO3,X3           LOAD IND REG 3               12  06653  B 06683 08880 4
1989                B       NO3               GO TO ROUTINE 3              11  06665  M 09025 00039 C
1990      CYLCMP    S       TRKCNT            RESET TRK COUNT               7  06676  J 052C6
1991                B       NO1               GO TO ROUTINE 1               6  06683  S 08881
1992      ANYMOR    S       TRKCNT            RESET TRCK COUNTER            7  06689  J 04896
1993                BZN     SUMORE,MODE,2     RUNNING ENTIRE MOD            6  06696  S 08881
1994                BW      AGAIN,OEMAC       IS OE-MAC SW ON              12  06702  V 06759 03874 2
1995                B       ALLDUN                                         12  06714  V 06733 08832 1
1996      AGAIN     B       SWOFF                                          7  06726  J 06891
                                                                           7  06733  J 06965
```

```
PGLIN  LABEL    OPCOD  OPERAND                    COMMENTS                          CT  ADDRS  INSTRUCTION
1997            MLCA   LOENC,FILE&5               RESET ADDR                        12  06740  D 08885 09896 T
1998            B      NO1                        GO TO ROUTINE 1                    7  06752  J 04896
1999    SUMORE  SW     LAST2&1                                                       6  06759  , 06563
2000            MLCA   @9&2C@,FILE&5              RESET FILE ADDR                   12  06765  D 09007 09896 T
2001            B      NO1                        GO TO ROUTINE 1                    7  06777  J 04896
2002    TWO53   SW     FILE&4                                                        6  06784  , 09895
2003            A      @1@,FILE&5                 UPDATE ADDR                       11  06790  A 08970 09896
2004            MRCWG  FILE,DATA                  SET ADDR IN DATA FLD              12  06801  D 09891 01710 D
2005            BCE    ALLDUN,FILE&4,6            ARE CE TRCKS COMPLET              12  06813  B 06891 09895 6 L
2006            ZA     &NO3,X3                    LOAD IND REG 3                    11  06825  M 09025 OCO39 Q
2007            B      NO3                        GO TO ROUTINE 3                    7  06836  J 05206
2008    UPSURF  A      @4C@,FILE&5                UPDATE BY 4C TO ADDRESS NEXT TRCK 11  06843  A 09009 09896
2009            C      FILE&5,LIMIT               HAS SURFACE BEEN COMPLETED        11  06854  C 09896 C8836
2010            BE     *&8                        IF SO BRCH                         7  06865  J 06879 S
2011            B      NO1                        GO TEST NEXT TRACK                 7  06872  J 04896
2012            BW     AGAIN,CEHAD                BRCH IF WRITTING ADDRESSES        12  06879  V 06733 08832 1
2013    ALLDUN  CW     LAST2&1,FILE&4             TURN OFF PASS SW                  11  06891  ¤ 06563 09895
2014            CW     SURFSW&1                   TURN OFF SURFACE TEST SWITCH       6  06902  ¤ 06588
2015            MLCA   LOENC,FILE&5                                                 12  06908  D 08885 09896 T
2016            BW     *&8,CEHAD                  IS CE-HAD SW ON                   12  06920  V 06939 08832 1
2017            B      UP1                        GO FIND ANOTHER MOD                7  06932  J 03660
2018            B      SWOFF                                                         7  06939  J 06965
2019            BCE    SUMORE,LOENC-2,#           BRCH IF TESTING CE-CYL            12  06946  B 06759 08883 #
2020            B      NO1                                                           7  06958  J 04896
2021    SWOFF   SBR    OFFXIT&5                   STORE RETURN ADDR                  7  06965  G 07002 8
2022            B      TYP1                       GO TO TYPE ROUTINE                 7  06972  J 01593
2023            DCW    @CE-HAD OFF@,G                                               10  06988
2024            H                                                                   1  06990  .
2025            CW     CEHAD                      TURN OFF CE-HAD SW                 6  06991  ¤ 08832
2026    OFFXIT  B      0                                                             7  06997  J 00000
2027    CESWON  SBR    ONXIT&5                    STORE RETURN ADDR                  7  07004  G 07040 8
2028            B      TYP1                                                          7  07011  J 01593
2029            DCW    @CE-HAD ON@,G                                                9  07026
2030            H                                                                   1  07028  .
2031            SW     CEHAD                                                        6  07029  , 08832
```

PGLIN	LABEL	OPCCD	OPERAND	CT	ADDRS	INSTRUCTION
2032	CNXIT	B	0	7	07035	J 00000

```
PGLIN     LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION

2034                       OF THE DATA FIELD
2035                    *** TEST ROUTINE DESCRIPTION ***
2036                 *** CHARACTER BY CHARACTER CHECK ROUTINE ***
2037          THIS ROUTINE IS USED BY ROUTINE NC4 & NC6,THC FC THE SURFACE
2038        ANALYSIS ROUTINES.THE ROUTINE CHECKS EVERY CHARACTER IN THE REC.
2039        READ BACK FROM THE FILE,WHEN A CHARACTER IS LOCATED WHICH WAS NOT
2040        RECORDED ITS LOCATION IN THE RECORD IS STORED IN INDEX REG. 7,AND
2041        THE ROUTINE RETURNS TO THE ROUTINE THAT DISCOVERED THE FAILURE.
2042        IF THE SAME TRACK FAILS AGAIN THIS ROUTINE CHECKS EVERY CHARACTER
2043        AND WHEN IT LOCATES A FAILURE THE LOCATION IN THE RECORD IS CHECK
2044        ED AGAINST THE FIRST FAILING LOCATION.IF THE LOCATIONS ARE THE
2045        SAME A SOLID ERROR WILL BE INDICATED,IF NOT A SOFT ERROR IS IND.
2046
2047      NO7       NOP                                                1  07042  N
2048                CC        @07@                                     2  07044
2049      CHARCK    SER       X8              STORE RETURN ADDR        7  07045  G 00064 8
2050                ZA        @45848@,X6      LOAD IX 6               11  07052  M 09029 00054
2051                MVCS      TSTBIT,*&12     MOVE THE TEST BIT       12  07063  D 08879 07086 3
2052      CHKONE    BCE       *&8,DATAFD&X6   CHECK EACH CHAR         12  07075  B 07094 092.0
2053                B         PAS2SW                                   7  07087  J 07113
2054                BW        PAS2SW,DATAFD&X6 CHEK FOR WM            12  07094  W 07113 092.0 1
2055                B         MATCH                                    7  07106  J 07145
2056      PAS2SW    NOPWM                                              1  07113  N
2057                B         PASS2                                    7  07114  J 07170
2058                ZA        X6,X9           SAVE ADDR OF BAD CHAR   11  07121  M 00054 00069
2059                SW        PAS2SW&1        TURN ON PASS SW          6  07132  , 07114
2060                B         0&X8                                     7  07138  J 00.00
2061      MATCH     S         @1@,X6          REDUCE IND REG 6 BY1    11  07145  S 08970 00054
2062                BZ        20&X8           BRCH ON ZERO RESULTS     7  07156  J 00.20 V
2063                B         CHKONE          GO CHECK ANOTHER CHR     7  07163  J 07075
2064      PASS2     CW        PAS2SW&1        TURN OFF SWITCH          6  07170  - 07114
2065                C         X6,X9           SAME CHAR BAD ON 2      11  07176  C 00054 00069
2066                BE        7&X8              PASSES,IF SO BRCH      7  07187  J 00.07 S
2067                B         39&X8           DIFFERENT CHAR BAD       7  07194  J 00.39
2068
```

CHARACTER BY CHARACTER CHECK

FGLIN LABEL CPCCD OPERAND CT ADDRS INSTRUCTION

```
PGLIN    LABEL    OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION

2070                     *** TEST ROUTINE DESCRIPTION ***
2071                   *** FLAG A DEFECTIVE TRACK ***
2072          THIS ROUTINE IS ENTERED ONLY AT THE DIRECTION OF CE,ITS PURPOSE
2073        IS TO ALLOW THE CE TO FLAG DEFECTIVE TRACKS AND TO INSURE THAT
2074        THE SELECTED ALTERNATE TRACK IS FREE OF DEFECTS.THE CE SELECTS
2075        THE ROUTINE AS A PROGRAM OPTION AND AT THE SAME TIME ENTERS THE
2076        HA1 ADDRESS AND FLAG CHARACTER.THE ROUTINE POSITIONS THE ACCESS,
2077        WRITES THE HOME ADDRESS ON THE ALTERNATE TRACK PLUS A CODE CHAR-
2078        ACTER,AND WRITES THE FLAG BIT ON THE DEFECTIVE TRACK.THE CE-HAC
2079        SWITCH IS TURNED OFF AND A READ HAD IS ISSUED,IF A NO RECORD
2080        FOUND RESULTS ERROR 11 IS INDICATED.IF THE TRACK READ DOESN T
2081        CONTAIN THE CODE CHARACTER RECORDED ON THE ALTERNATE TRACK ERROR
2082        12 IS INDICATED,THE ALTERNATE TRACK DID NOT GET SELECTED.IF
2083        EITHER ERROR 11 OR 12 OCCUR THE CE SHOULD RE-SELECT THE FLAG
2084        ROUTINE USING A DIFFERENT FLAG CHAR.IF THERE HAVE BEEN NO ERROR
2085        INDICATIONS A MSG,TRCK FLGD OK,IS TYPED OUT THE CE NOW SELECTS
2086        ANY PROGRAM OPTION AVAILABLE,NORMALLY THE CONTINUE OPTION WOULD
2087        BE TAKEN.ALL STATUS ERRORS WILL BE INDICATED.
2088
2089
2090        NOTE EXTREME CAUTION SHOULD BE USED WHEN SELECTING A FLAG CHAR-
2091        ACTER,SO THAT AN ALTERNATE TRACK THAT IS ALL READY IN USE IS NOT
2092        SELECTED AGAIN.
2093
2094
2095        FORMAT REQUIRED IS THE SAME AS DESCRIBED IN ROUTINE NO2
2096
2097        DATA FIELD USED ON ALTERNATE TRACK AND DEFECTIVE TRACK
2098        HA1-FLAG CHAR-HA2-CODE CHARACTER  CODE CHAR IS A IN POSITION 8
2099         EXAMPLE  CCC0888A   ALTERNATE TRACK
2100        EXAMPLE  CCCC288N   DEFECTIVE TRACK
2101
2102     N10        NOP                                              1  07201  N
2103                DC     @1C@              ROUTINE IDENT           2  07203
2104                MLCB   FILE65,SAVADD     SAVE FILE ADDR         12  07204  D 09896 08894 L
```

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
2105		ZA	&N1C,X3	LOAD IND REG 3	11	07216	M 09034 CCC39
2106		MLCS	206,FLGCHR	SAVE SELECTED FLAG CHARACTER	12	07227	D 00206 08964 3
2107		MLCA	206,FILE&6	MOVE FLAG ADDR	12	07239	D 00206 09897 1
2108		CS	29S	CLEAR CONTROL FLD	6	07251	/ 00299
2109		SD	1,FILE	POSITION ACCESS	10	07257	M %F0 09891 R
2110		BCB1	*-16		7	07267	R 07257 2
2111		BA1	*&1		7	07274	R 07281 GM
2112		BW	WFCOUN,CERAO	BRCH IF SW IS ON	12	07281	V 07306 08832 1
2113		CW	BACKON&1		6	07293	@ 07772
2114		B	CESWCN		7	07299	J 07004
2115	WFCOUN	MRCWG	FILE&2,DATAFD	LOAD ADDR IN DATA FLD	12	07306	D 09893 09900 DL
2116		MLCA	@888A@,DATAFD&7	SET WA 2	12	07318	D 09038 09907 1
2117		MLCWS	@W@,DATAFD&23	SET TERMONATING WMGM	12	07330	D 08968 09923 7
2118		LL	%F5,FILE,W	WRITE FA1 ON ALTER	10	07342	L %F5 09891 W
2119		BCB1	*-16		7	07352	R 07342 2
2120		BA1	*&1		7	07359	R 07366 GM
2121		LL	%F5,FILE,R	CHECK FOR PROPER MODE	10	07366	L %F5 09891 R
2122		BA1	*&1		7	07376	R 07383 GM
2123		BEX1	*&8,S M	BRCH ON 8 BIT ERROR	7	07383	R 07397 SM
2124		B	OTHER		7	07390	J 07462
2125		MRCWG	FILE&2,DATAFD	LOAD ADDR IN DATA FLD	12	07397	D 09893 09900 DL
2126		MLCA	@888A@,DATAFD&7	SET WA2	12	07409	D 09038 09907 1
2127		ML	%F5,FILE,W	WRITE FA1 IN SIX BIT MODE	10	07421	M %F5 09891 W
2128		BA1	*&1		7	07431	R 07438 GM
2129		ML	%F5,FILE,R	CHECK FOR PROPER MODE	10	07438	M %F5 09891 R
2130		BA1	*&1		7	07448	R 07455 GM
2131		BEX1	STACHK,S M	GO REPORT ERRORS	7	07455	R 03136 SM
2132	OTHER	MRCWG	FILE&2,DATAFD	MOVE FILE ADDR	12	07462	D 09893 09900 DL
2133		MLCS	@8@,FILE&6	RESTORE WA2	12	07474	D 09018 09897 3
2134		MLCA	@888N@,DATAFD&7	LOAD WA2 & CODE CHARACTER	12	07486	D 09042 09907 1
2135		MLCS	FLGCHR,DATAFD&4	LOAD FLAG CHARACTER	12	07498	D 08964 09904 3
2136		LL	%F5,FILE,W	WRITE FLAG BIT	10	07510	L %F5 09891 W
2137		BA1	*&1		7	07520	R 07527 GM
2138		LL	%F5,FILE,R	CHECK FOR PROPER MODE	10	07527	L %F5 09891 R
2139		BA1	*&1		7	07537	R 07544 GM
2140		BEX1	*&8,S M	BRCH ON 8 BIT ERROR	7	07544	R 07558 SM

```
FGLIN     LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION
2141                B      OTHER1                                     7   07551  J 07647
2142                MRCHG  FILE&2,DATAFD                              12  07558  D 09893 09900 C L
2143                MLCA   @888N&,DATAFD&7   LOAD HA2 & CODE CHARACTER 12  07570  D 09042 09907 T
2144                MLCS   FLGCHR,DATAFD&4   LOAD FLAG CHARACTER       12  07582  D 08964 09904 3
2145                MLCS   @8&,FILE&6        RESET FLAG                12  07594  D 09018 09897 3
2146                ML     %F5,FILE,W         WRITE IN 6 BIT MODE       10  07606  M %F5 09891 W
2147                BAI    *&1                                          7   07616  R 07623 G M
2148                ML     %F5,FILE,R         CHECK FOR PROPER MODE     10  07623  M %F5 09891 R
2149                BAI    *&1                                          7   07633  R 07640 G M
2150                BEX1   STACHK,M S         GO REPORT ERROR           7   07640  R 03136 M S
2151     OTHER1     B      SWOFF                                        7   07647  J 06965
2152                LL     %F5,FILE,R         READ THE ALTER TRK        10  07654  L %F5 09891 R
2153                BAI    *&1                                          7   07664  R 07671 G M
2154                BEX1   *&&,M S                                      7   07671  R 07685 M S
2155                B      OTHER2                                       7   07678  J 07702
2156                ML     %F5,FILE,R         READ ALTERNATE IN 6 BIT MODE 10 07685 M %F5 09891 R
2157                BAI    *&1                                          7   07695  R 07702 G M
2158     OTHER2     BEX1   *&15,Y             REPORT ERROR              7   07702  R 07723 Y
2159                BEX1   STACHK,7                                     7   07709  R 03136 7
2160                B      HAICK                                        7   07716  J 07741
2161                    *** SET ERROR 11 ON ***
2162                SW     E11,NOGO&1         TURN OFF ERROR IND        11  07723  , 01812 07809
2163       AFTER FLAGGING DEFECTIVE TRACK AND WRITTING HA1 ALTERNATE A READ
2164       HAC OP CAUSES A NO RECORD FOUND.
2165                B      MONITR                                       7   07734  J 02101
2166     HAICK      BCE    BACKON,DATAFD&2,A  BRCH IF ALTER TRK SLECTED 12  07741  B 07771 09902 A
2167                    *** SET ERROR 12 ON ***
2168                SW     E12,NOGO&1         TURN ON ERROR IND         11  07753  , 01813 07809
2169       AFTER FLAGGING BAD A READ OF THAT ADDRESS DOES NOT SELECT
2170       ALTERNATE TRACK
2171                B      MONITR             GO IND ERROR              7   07764  J 02101
2172     BACKON     NOP                                                 1   07771  N
2173                B      OESWON                                       7   07772  J 07004
2174                SW     BACKON&1                                     6   07779  , 07772
2175                MLCA   SAVADD,FILE&5       RESTORE ADDR              12  07785  D 08894 09896 T Q
2176                ZA     &NC1,X2            LOAD IX 2                 11  07797  M 09014 00034
```

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PGLIN     LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION

2177      NCGC      NOPWM                                              1  07808  N
2178                B      *E28                                        7  07809  J 07843
2179      LETSGC    B      TYP1                                        7  07816  J 01593
2180                DCW    @TRCK FLGC CK@,G                           12  07834
2181                B      PRGCTL                                      7  07836  J 02273
2182                CW     NCGC61                                      6  07843  D 07809
2183                    *** SET ERROR 13 CN ***
2184      @ALTRK    SW     E13                TURN ON ERROR IND        6  07849  , 01814
2185        SELECTED ALTERNATE TRACK APPEARS TO BE DEFECTIVE
2186                B      MCNITR             GO REPORT ERROR          7  07855  J 02101
2187                B      PRGCTL             GO TO PROGRAM CONTROL    7  07862  J 02273
2188
```

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
2190			*** TEST ROUTINE DESCRIPTION ***				
2191			*** PREPARE ONE INSTRUCTION LOOP AND DATA FIELD ***				
2192			*** ACCORDING TO CE REQUEST ***				
2193			WHEN THE CE SELECTS THE PROGRAM OPTION FOR ONE INSTRUCTION LOOP				
2194			ING,THIS ROUTINE TAKES THE DATA ENTERED BY THE CE AND BUILDS THE				
2195			DATA FIELD AND LOOP INSTRUCTION FROM IT.WHEN IT HAS COMPLETED				
2196			THIS IT POSITIONS THE ACCESS TO THE ADDRESS ENTERED AND BRANCHES				
2197			TO THE LOOP ROUTINE.				
2198							
2199	PREP	MLCA	226,RECADD	STORE LOOP DATA	12	07869	D 00226 08919 T
2200		CS	299	CLEAR CNTL FLD	6	07881	/ 00299
2201		ZA	ADDR3,X1C	LOAD IX 1C	11	07887	M 08950 0C074
2202		SW	DATAFD	CLEAR	6	07898	, 09900
2203	CLEAN7	CS	C&X1C	THE	6	07904	/ 00**0
2204		SER	X1C	DATA	7	07910	G 00074 B
2205		BW	CLEAN7,DATAFD	FIELD	12	07917	V 07904 09900 1
2206		MLCE	XCTL1-1,LOOP&1	SET MODE & CHANNEL	12	07929	D 08896 01014 L
2207		MLCS	XCTL1,LOOP&3	SET SPECIFIC OPER	12	07941	D 08897 01016 3
2208		MLCS	XCTL1&1,LOOP&9	SET MODIFIER	12	07953	D 08898 01022 3
2209		ZA	NOFCHR,X8	LOAD IND REG 8	11	07965	M 08912 0C064
2210		ZA	NOFREC,WORK1	ADD NO. OF RECORDS	11	07976	M 08908 08927
2211		A	&66,NOFCHR	INCREASE CHAR COUNT	11	07987	A 09043 08912
2212		M	NOFCHR,WORK2	RECORDS X CHARS	11	07998	M 08912 08932
2213		ZA	WORK2,X9	LOAD RESULT INTO IXS	11	08009	M 08932 0C069
2214		MLCS	NOFCHR&1,DATAFD		12	08020	D 08913 09900 3
2215		MLCS	BOSIC,LOOP&10	ALTER B-O-S-I-C OP	12	08032	D 08899 01023 3
2216		MLCA	HA2,FILE&7		12	08044	D 08905 09898 T
2217		S	WORK2	RESET WORK 2	6	08056	S 08932
2218		BCE	LOOP,LOOP&3,0	BRCH IF SEEK OP	12	08062	B 01013 01C16 C
2219		MLCS	LOOP&1,*&2		12	08074	D 01014 08C87 3
2220		SO	1,FILE	POSITION THE ACC	10	08086	M %F0 09891 R
2221		BCB1	*-16		7	08096	R 08086
2222		BA1	*&1		7	08103	R 0811C M
2223		MLCS	LOOP&3,*&12	MOVE THE OP CODE	12	08110	D 01016 08133 3
2224		BCE	SRC,SPECOD,	IS THE OP CODE 1	12	08122	B 08165 08924

```
                    PREPARE ONE INSTRUCTION LOOP AND DATA FIELD
PGLIN     LABEL     OPCOD  OPERAND
2225                BCE    TRC              IS THE OP CODE 2
2226                BCE    HAC              IS THE OP, CODE 5
2227                BCE    TWA              IS THE OP CODE 6
2228                BCE    WFC              IS THE OP CODE 7
2229                B      PROCTL           SPCIFIC OP INCORRECT
2230      SRC       MLCA   RECADD,FILE67     LOAD REC ADDR
2231                Sw     DATAFD&X8        LOAD
2232                MRCw   DATAFD,DATAFD&1            DATA
2233                MLCwS  @M@a,DATAFD&X8                FIELD
2234                B      LOOP&1C
2235      TRC       S      @6@a,NOFCHR      RESET NOFCHR COUNT
2236                S      WORK2            RESET WORK AREA
2237                ZA     NOFREC,WORK1     LOAD WORK AREA
2238                M      NOFCHR,WORK2     RECORDS X CHARS
2239                ZA     WORK2,X9         LOAD RESULT INTO IX9
2240                Sw     DATAFD&X9            THE
2241                MRCw   DATAFD,DATAFD&1            DATA
2242                MLCwS  @M@a,DATAFD&X9                FIELD
2243                B      LOOP&1C
2244      HAC       A      @2@a,X9
2245                ZA     @OOOOOO@a,X8     RESET IND REG 8
2246                Sw     DATAFD&X9        LOAD
2247                MRCw   DATAFD,DATAFD&1            DATA
2248                MLCwS  @M@a,DATAFD&X9                FIELD
2249                MRC    HA2-1,DATAFD     LOAD HA2 ADDR
2250      LOADDR    MLCA   RECADD,DATAFD&7&X8 LOAD
2251                S      @1@a,NOFREC          THE
2252                BZ     LOOP&1C
2253                A      NOFCHR,X8                 ADDR
2254                A      @1@a,RECADD                 IN
2255                B      LOADDR           THE DATA FLD
2256      TWA       Sw     DATAFD&X9        LOAD
2257                MRCw   DATAFD,DATAFD&1            DATA
2258                MLCwS  @M@a,DATAFD&X9                FIELD
2259                ZA     @OOOOOO@a,X8     LOAD
```

```
                                DC01          PAGE  68
CT   ADDRS   INSTRUCTION
 6   08134   B 08214
 6   08140   B 08301
 6   08146   B 08424
 6   08152   B 08524
 7   08158   J 02273
12   08165   D 08919 09898 I
 6   08177   , 09R00
12   08183   D 09900 09901 IM
12   08195   D 08968 09R00 7
 7   08207   J 01023
11   08214   S 09043 08912
 6   08225   S 08932
11   08231   SM 08908 08927
11   08242   a 08912 08932
11   08253   aM 08932 00069
 6   08264   , 09R#0
12   08270   D 09900 09901 IM
12   08282   D 08968 09R#0 7
 7   08294   J 01023
11   08301   A 08983 00069
11   08312   AM 09048 00064
 6   08323   , 09R#0
12   08329   D 09900 09901 IM
12   08341   D 08968 09R#0 7
12   08353   D 08904 09900 #
12   08365   D 08919 09R07 1
11   08377   S 08970 08908
 7   08388   J 01023 V
11   08395   A 08912 00064
11   08406   A 08970 08919
 7   08417   J 08365
 6   08424   , 09R#0
12   08430   D 09900 09901 IM
12   08442   D 08968 09R#0 7
11   08454   AM 09048 00064
```

```
                    PREPARE ONE INSTRUCTION LOOP AND DATA FIELD                                    DC01        PAGE  68 R
PGLIN     LABEL     OPCOD  OPERAND                                                          CT  ADDRS  INSTRUCTION
2260      LCCADD    MLCA   RECADD,DATAFD&5&X8     THE                                     12  08465  D 08919 09R05 T
2261                S      @1@,NOFREC               RECORD                               11  08477  S 08970 08908
2262                BZ     LCCP&1C                                                       7  08488  J 01023 V
2263                A      NOFCHR,X8                INTO                                 11  08495  A 08912 0CC64
2264                A      @1@,RECADD                  THE                               11  08506  A 08970 08919
2265                B      LCCADD                         DATA FIELD                      7  08517  J 08465
2266      WFC       SW     DATAFD&7CCC                                                    6  08524  , 16900
2267                MRC    DATAFC,DATAFD&1             FIELD                              12  08530  D 09900 09901 #
2268                MLCA   WAAREA,DATAFD&32  LOAD THE WAI AREA OF THE FORMAT               12  08542  D 08877 09932 T
2269                S      @6@,NOFCHR        RESET NO. OF CHAR                          11  08554  S 09043 08912
2270                ZA     NOFREC,WORK1      DETERMINE THE END                          11  08565  AC 08908 08927
2271                A      @1@,NOFCHR&1            ADDRESS AREAS                        11  08576  A 08970 08913
2272                SW     DATAFD&42                                                      6  08587  , 09942
2273                MLCS   NOFCHR&1,DATAFD&56 LOAD THE LONG GAPS                          12  08593  D 08913 09956 3
2274                MLCB   DATAFD&56,DATAFD&55  OF THE FORMAT FIELD                       12  08605  D 09956 09955 L
2275                MLCS   DATAFD&56,DATAFD&84                                           12  08617  D 09956 09984 3
2276                MLCS   DATAFD&56,DATAFD&7C  LOAD THE SHORT GAPS                      12  08629  D 09956 09970 3
2277                A      @5C@,NOFCHR       DETERMINE SIZE OF RECS IN FORMAT           11  08641  AC 09050 08912
2278                ZA     NOFCHR,X9                THE  FORMAT                          11  08652  M 08912 0CC69
2279      LCCFCR    MLCA   DATAFD&84,DATAFD&84&X9                                        12  08663  D 09984 09RY4 T
2280                S      @1@,NOFREC                                                   11  08675  S 08970 08908
2281                BZ     *&19                BRCH IF ALL REC DON                      7  08686  J 08711 V
2282                A      NOFCHR,X9                                                    11  08693  A 08912 0CC69
2283                B      LCCFCR                                                       7  08704  J 08663
2284                MLCS   NOFCHR&1,DATAFD&42&X9  LOAD LAST GAP                         12  08711  D 08913 09RU2 3
2285                MLCWS  @M@,DATAFD&43&X9   TERMINATING WMGM                          12  08723  D 08968 09RU3 7
2286                B      LCCP&1C                                                      7  08735  J 01023
```

```
PGLIN   LABEL    OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2288                    DAC1C END TEST ROUTINE
2289                ***  END TEST ROUTINE  ***
2290     ENDTST     B      TYP1                                           7  08742  J 01593
2291                DCW    @INSURE CE-MAC & WRT FORMAT SWS ARE OFF@,G    38  08786
2292                H                          WAIT FOR ACTION            1  08788  .
2293                BW     SWOFF,CEMAC         TS CE-MAC SW ON           12  08789  V 06965 08832 1
2294                B      TYP1                GO TYPE END MESG           7  08801  J 01593
2295                DCW    @PASS@,G                                       4  08811
2296                BCE    2000,TAG3,1         BRCH IF REPEATING         12  08813  B 02000 01003 1
2297     TOP        H      400                 GO TO LOADER               6  08825  . 00400
2298                H                                                     1  08831  .
2299
2300     CEMAC      DC     @ @                                            1  08832
2301     LIMIT      DCW    @    @                                         4  08836
2302     NUMCDE     DCW    @76543210@                                     7  08843
2303     CPTNSW     DC     @ @                                            1  08844
2304     MAREA      DCW    @4444443333333333334333333333333340@,G        33  08877
2305     TSTBIT     DCW    @ @                                            1  08879
2306     TRKCNT     DCW    @CC@                                           2  08881
2307     LCEND      DCW    @CCCC@                                         4  08885
2308     SAVFLG     DCW    @CCCCC@                                        5  08890
2309     SAVADD     DCW    @CCCC@                                         4  08894
2310     LPDATA     DCW    @ @                                            1  08895
2311                DCW    @ @                                            1  08896
2312     XCTL1      DCW    @ @                                            1  08897
2313                DC     @ @                                            1  08898
2314     DCSIC      DCW    @ @                                            1  08899
2315     TKHD       DCW    @    @                                         4  08903
2316     MA2        DC     @  @                                           2  08905
2317     NCFREC     DCW    @   @                                          3  08908
2318     NCFCHR     DCW    @    @                                         4  08912
2319                DC     @ @                                            1  08913
2320     RECADD     DCW    @      @                                       6  08919
2321     SPECDD     DCW    @76521@                                        5  08924
2322     WCRK1      DCW    @CCC@                                          3  08927
```

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
2323	hCRK2	DC	a0CCCCCa	5	08932	
2324	INTLCK	CCW	aMSSBa	3	08935	
2325	ACCR1	CCW	DATAFDC4620	5	08940	14520
2326	ACCR2	CCW	DATAFDC4577	5	08945	14477
2327	ACCR3	CCW	DATAFDC7CCC	5	08950	16900
2328	TENCNT	CCW	a0a	1	08951	
2329	CCCE3	CCW	a%R1a	3	08954	
2330		CCW	aDX2a	3	08957	
2331		CCW	aM33a	3	08960	
2332		CCW	a.14a	3	08963	
2333	FLGCHR	CCW	a a	1	08964	
2334		LTORG			08965	
2334			aNa	1	08965	
2334			a$a	1	08966	
2334			aLa	1	08967	
2334			aMa	1	08968	
2334			a a	1	08969	
2334			a1a	1	08970	
2334			aCC2C9a	5	08975	
2334			a3a	1	08976	
2334			a7a	1	08977	
2334			aCC237a	5	08982	
2334			a2a	1	08983	
2334			aCCa	2	08985	
2334			aCCCCa	4	08989	
2334			a1232a	4	08993	
2334			a57a	2	08995	
2334			aCC39a	4	08999	
2334			a9$6Ca	4	09003	
2334			a9$2Ca	4	09007	
2334			a4Ca	2	09009	
2334			NO1	5	09014	04896
2334			a4a	1	09015	
2334			a88a	2	09017	
2334			a8a	1	0901A	

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
2334			@V@	1	09019	
2334			@'@	1	09020	
2334			NC3	5	09025	052C6
2334			@45@4@	4	09029	
2334			NIC	5	09034	07201
2334			@8@@A@	4	09038	
2334			@@E@N@	4	09042	
2334			@6@	1	09043	
2334			@0C0C0@	5	09048	
2334			@5C@	2	09050	
2335		CRG	9891		09891	
2336	FILE	CCW	@CCCCCC@@@,G	8	09891	
2337	CATAFC	CC	@ @	1	09900	
2338		CS	47CC		14600	
2339		END	2CCC			J02000

END OF ASSEMBLY

6.23.00.0 DC02 RELIABILITY TEST DESCRIPTION

The program tests every available access and module on every channel in an automatic or manual mode. The automatic mode requires limited manual intervention, the manual mode requires more extensive intervention and can not be run unattended.

The normal sequence of the program starts by testing the Error Detection Ckts in the 7631. This is followed by 100 random seeks (using both accesses of the module) and verification that the access arrived at the correct location. At the CE cylinder (250) Read, Write, and Write Format are tested in 6 and 8 bit mode, the Read-Write test being performed on each of the 40 heads. The specific file operation; home address, full track with address, full track without addresses, single record, and cylinder, are tested for both read and write in the 8 bit mode. The cylinder op is tested only when in manual mode so that its availability can be checked. If the priority feature is available, a quick check of the seek complete line is made.

This is performed on every channel for every ready 1302 Access & Module. When all accesses have been tested, the test ends, if in automatic mode. If it is in manual mode, the program runs an overlap test where files and tapes on any channel are overlapped. When the overlap routine is completed, the test in manual mode is over.

6.23.01.0 OPERATING PROCEDURE

The standard procedures outlined in the package write-up apply to this program, in addition the following procedures are used to run this program.

01.1 SWITCH SETTINGS PREVIOUS TO RUNNING PROGRAM

a. HAO switch ON (on all 7631's to be tested)
b. All 1302 accesses not to be tested are set inoperative.
c. All other 7631-1302 switches OFF.

6.23.01.0 OPERATING PROCEDURE (continued)

01.2 SPECIAL REQUESTS

a. "Turn on Format & CE Wrt for this Acc & Mod"
CE turns on format Sw on the 1302 access & module that the program is about to test; also turn on CE Wrt switch on the 7631. Press Start to continue.

b. "CYO Available" (Manual Mode Only)
CE enters 1 if it is, 1 if it is not. (1 = any other character but 1.)

c. "CE-HAO ON"
Ce turns on CE-HAO switch and presses start. This request is made when during the random seek test the access does not arrive at the correct location. With the CE-HAO switch on, the HA1 is read into memory and displayed on the typewriter.

d. "Addr Read, 0000000, CE-HAO OFF"
The CE now turns off the CE-HAO switch and presses start to continue.

01.3 SPECIAL TADS

There is one special TAD for this program (memory location 01004).

If this TAD is set to a 1, the program will run in the manual mode. This TAD is set to a 1 when the program is loaded.

01.4 STANDARD OPTIONS

All the standard program options are available in this program.

01.5 MANUAL MODE

When running in the manual mode, all channels which have tapes, but do not have files should have a scratch tape loaded and ready on Drive "1". This is required for proper operation of the overlap test.

01.6 SUMMARY TYPEOUT

The summary typeout as described in the package write-up is given at the end of this test.

6.23.02.0 OPERATING HINTS

02.1 SELECTING MANUAL MODE (Alter Special TAD)

Use program option code 2 (alter memory) to alter the special TAD to a 1 or 1. Special TAD location is 01004.

02.2 RELIABILITY RUN

To run the program in a reliability mode:

1. Run program in automatic mode.
2. Alter TADS (select option code 3) to repeat test.
3. Terminate program when desired (select option code blank).

02.3 ALTER ROUTINE SEQUENCE

If this program option is selected, card should be used to insure that the format required by certain routines is available when the routine is run in the altered sequence.

6.23.03.0 PROGRAM STOPS

03.1 ERROR STOPS

None

03.2 NORMAL STOPS - Manual Mode Only

Mem Loc	Reason
07773	Wait for CE to turn on CE Wrt, and Format Switches.
05644	Wait for CE to turn on CE-HAO switch, press start.
05728	Wait for CE to turn off CE-HAO switch, press start.

6.23.04.0 TYPEOUTS (Other than request or standard typeouts)

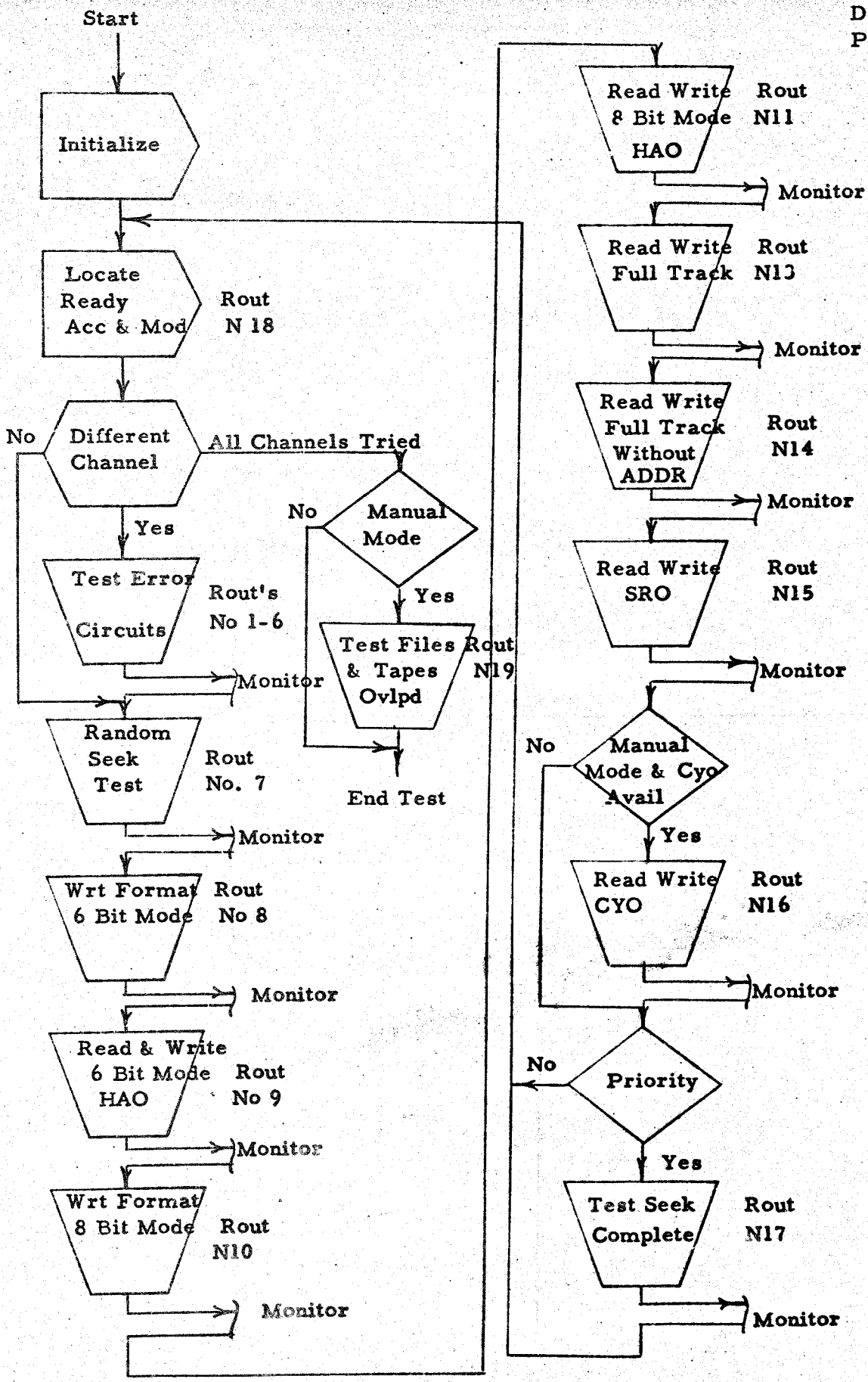
04.1 "TST ACC x MOD x CH x"

This tells the CE which access and module on which channel is about to be tested.

TEST TERMINATED WITH INSTR CK. 04416 - SUCCESSFUL

6.23.05.0 FLOW CHART

The following flow chart is designed to give a general picture of the test routine's relationship to one another.


Start
Initialize
Locate Ready Acc & Mod
Rout N 18
No
Different Channel
All Channels Tried
Yes
Test Error Circuits
Rout's No 1-6
Monitor
Random Seek Test
Rout No. 7
Monitor
Wrt Format 6 Bit Mode
Rout No 8
Monitor
Read & Write 6 Bit Mode HAO
Rout No 9
Monitor
Wrt Format 8 Bit Mode
Rout N10
Monitor
No
Manual Mode
Yes
Test Files & Tapes Ovlpd
Rout N19
End Test
Read Write 8 Bit Mode HAO
Rout N11
Monitor
Read Write Full Track
Rout N13
Monitor
Read Write Full Track Without ADDR
Rout N14
Monitor
Read Write SRO
Rout N15
Monitor
No
Manual Mode & Cyo Avail
Yes
Read Write CYO
Rout N16
Monitor
No
Priority
Yes
Test Seek Complete
Rout N17
Monitor

6.23.06.0 ROUTINE/ERROR INDEX DC02

To locate routines and errors in the program listing.

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1002		CTL	2				
1003							
1004		DEFINE STANDARD TACS		**			
1005							
1006		ORG	1000	**		01000	
1007	TAD0	DCW	@ @		1	01000	
1008	TAD1		@ @		1	01001	
1009	TAD2		@ @		1	01002	
1010	TAD3				1	01003	
1011				**			
1012		DEFINE SPECIAL TADS					
1013				**			
1014	SPTAC0	DCW	@ @		1	01004	
1015	SPTAC1		@ @		1	01005	
1016	SPTAC2		@ @		1	01006	
1017	SPTAC3		@ @		1	01007	
1018	SPTAC4		@ @		1	01008	
1019	SPTAC5		@ @		1	01009	
1020	SPTAC7		@ @		1	01010	
1021	SPTAC8		@ @		1	01011	
1022	SPTAC9		@ @		1	01012	
1023							

```
PGLIN     LABEL     OPCOD  OPERAND                    CT  ADDRS  INSTRUCTION
1C25                       *** I/C DICOST PROGRAM ***
1C26                   *** ONE INSTRUCTION LOOP ROUTINE ***
1C27          WHEN THE CE SELECTS A ONE INSTRUCTION LOOP THE I/O INSTRUCTION
1C28        IN THIS ROUTINE IS ALTERED AND THE LOOP IS ENTERED.NOTE THAT THE
1C29        BRANCH ON INQUIRY INSTRUCTION IS THE ONLY EXIT FROM THE LOOP.
1C30      LOOP      MU     811,0,R                    I/O INST BEING LUP D   10  01013  M 811 00000 R
                                                                                                    G
1C31                BAI    *E1                                               7  01023  R 01030 M
1C32                BNQ    PRGCTL                     BRCH ON INQ TO PRGCL   7  01030  J 02285 Q
1C33                B      LOOP                       CONTINUE TO LOOP       7  01037  J 01013
1C34                H                                                        1  01044  .
1C35
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1037                   *** I/O DICOST PROGRAM ***
1038                *** CHANNEL ALTER ROUTINE ***
1039          THIS ROUTINE ALTERS ALL I/O INSTRUCTIONS,BRANCH-ON-STATUS-
1040          INDICATOR-ON INSTRUCTIONS,AND BRANCH ON CHANNEL OVERLAP IN PRO-
1041          CESS INSTRUCTIONS ACCORDING TO THE CHANNEL INDICATED.THIS IS DONE
1042          BY SCANNING A DEFINED AREA OF MEMORY AND ALTERING THESE INSTRUC-
1043          TIONS.
1044
1045      CHALTR    SBR    X5          STORE ADDR                    7  01045  G 00049 B
1046                MLCA   9&X5,X7     LOAD IX6 & IX7               12  01052  D 00*9 00059 T
1047      SCAN      SCNLA  0&X6,0&X6   SCAN FOR WM                  12  01064  D 00*.0 00*.0 B
1048                SAR    X6          STORE ADDR OF OPER            7  01076  G 00054 A
1049                C      X6,X7       HAS ALL OF FLD BEEN          11  01083  C 00054 00059
1050                BH     13&X5       SEARCHED IF SO BRCH           7  01094  J 00*/3 U
1051                MLCS   1&X6,*&12   STORE OP CODE                 12  01101  D 00*.1 01124 3
1052                BCE    MLCRU,CODES, IS OP CODE M                12  01113  B 01149 02785
1053                BCE                IS OP CODE L                  1  01125  B
1054                BCE                IS OP CODE U                  1  01126  B
1055                BCE    RX3OR1      IS OP CODE R                  6  01127  B 01168
1056                BCE                IS OP CODE X                  1  01133  B
1057                BCE                IS OP CODE 3                  1  01134  B
1058                BCE                IS OP CODE 1                  1  01135  B
1059                BCE    JAY         IS OP CODE J                  6  01136  B 01187
1060                B      SCAN        GO FIND NEXT OPER             7  01142  J 01064
1061      MLCRU     MLCS   10&X5,2&X6   CHEANGE CH-MODE CHAR         12  01149  D 00*/0 00*.2 3
1062                B      SCAN        GO FIND NEXT OPER             7  01161  J 01064
1063      RX3OR1    MLCS   11&X5,1&X6   CHANGE B-I-S-I-O OP          12  01168  D 00*/1 00*.1 3
1064                B      SCAN        GO FIND NEXT OPER             7  01180  J 01064
1065      JAY       MLCS   7&X6,*&12   STORE MODIFIER                12  01187  D 00*.7 01210 3
1066                BCE    ONE234,MODS, IS MODIFIER A 1             12  01199  B 01221 02789
1067                BCE                IS MODIFIER A 2               1  01211  B
1068                BCE                IS MODIFIER A 3               1  01212  B
1069                BCE                IS MODIFIER A 4               1  01213  B
1070                B      SCAN        GO FIND NEXT OPER             7  01214  J 01064
1071      ONE234    MLCS   12&X5,7&X6   CHANGE BOL MODIFIER          12  01221  D 00*/2 00*.7 3
1072                B      SCAN        GO FIND NEXT OPER             7  01233  J 01064
1073                H                                                1  01240  .
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
1074
1075
1076                DEFINE SYSTEM & CHANNEL CONTROL CARDS
1077
1078                ORG    1233                                                  01233
1079                DCW    @FP6FMLFMTFMC381/20                              17   01249
1080                                                        **
1081                DEFINE PROGRAM TITLE
1082                                                        **
1083                ORG    1250                                                  01250
1084                DCW    @DC02B@,G                                         5   01254
1085
1086                LOCATE THE SYSTEM & CHANNEL CARDS
1087
1088                ORG    1256                                                  01256
1089      SYSTEM    DC     @                                        @        50   01256
1090                       @      @                                          7   01312
1091                ORG    1289                                                  01289
1092      CHNL1     DC     @                                        @        50   01289
1093                       @      @                                          7   01345
1094                ORG    1346                                                  01346
1095      CHNL2     DC     @                                        @        50   01346
1096                       @      @                                          7   01402
1097                ORG    14C3                                                  01403
1098      CHNL3     DC     @                                        @        50   01403
1099                       @      @                                          7   01459
11C0                ORG    1460                                                  01460
11C1      CHNL4     DC     @                                        @        50   01460
11C2                       @      @                                          7   01516
11C3
```

```
PGLIN   LABEL    OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1105                    *** I/O DICOST PROGRAM ***
1106                *** TYPE AND REQUEST FOR INTERVENTION ***
1107          THIS ROUTINE IS USED TO TYPE ALL MESSAGES AND REQUESTS FOR
1108        MANUAL INTERVENTION.THE ROUTINE WILL TYPE A MESSAGE FROM A COMMON
1109        DATA FIELD,OR THE MESSAGE MAY BE LOCATED IMMEDIATELY AFTER THE
1110        BRANCH INSTRUCTION TO THIS ROUTINE.IF A REPLY IS REQUIRED A READ
1111        CONSOLE PRINTER OPERATION IS ISSUED.THIS ROUTINE IS USED TO TYPE
1112        ALL MESSAGES IN THIS PROGRAM.
1113
1114    TYPES    SBR    TYPXIT&5          STORE RETURN ADDR                 7  01517  G 01591 B
1115    TYPB     WCP    201               TYPE MESSAGE                     10  01524  M %TO 00201 W
1116             BEX1   *-16,S,M          BRCH ON ANY BUT WLR               7  01534  R 01524 S,M,G
1117             BA1    *&1                                                 7  01541  R 01548 M
1118    SW11     NOPWM                                                      1  01548  N
1119    LA860    RCP    0                 READ CONSOLE PRINTER             10  01549  M %TO 00000 R
1120             BEX1   *-16,S,M          BRCH ON ANY BUT WLR               7  01559  R 01549 S,M,G
1121             BA1    *&1                                                 7  01566  R 01573 M
1122             CW     SW11&1            TURN OFF SWITCH 11                6  01573  ¤ 01549
1123             CS     33C               CLEAR PRINT AREA                  6  01579  / 00330
1124             CS                                                         1  01585  /
1125    TYPXIT   B      0                 RETURN TO DICOST                  7  01586  J 00000
1126    TYP1     SBR    X1                STORE ADDR OF MESG                7  01593  G 00029 B
1127             B      *&14                                                7  01600  J 01620
1128    TYP2     SBR    X1                STORE ADDR OF MESG                7  01607  G 00029 B
1129             SW     REPLY&1           TURN ON REPLY SW                  6  01614  , 01652
1130             WCP    0&X1              TYPE MESSAGE                     10  01620  M %TO 000*0 W
1131             SBR    X5                SAVE ADDRESS                      7  01630  G 00049 B
1132             BEX1   *-23,S,M          BRCH ON ANY BUT WLR               7  01637  R 01620 S,M,G
1133             BA1    *&1                                                 7  01644  R 01651 M
1134    REPLY    NOPWM                    BRCH                              1  01651  N
1135             B      RDCON             IF REPLY REQUIRED                 7  01652  J 01666
1136             B      0&X5              RETURN                            7  01659  J 00**0
1137    RDCON    RCP    0&X5              REPLY TO MESSAGE                 10  01666  M %TO 00**0 R
1138             SBR    X1                SAVE ADDR                         7  01676  G 00029 B
1139             BEX1   *-23,S,M          BRCH ON ANY BUT WLR               7  01683  R 01666 S,M,G
1140             BA1    *&1                                                 7  01690  R 01697 M
1141             CW     REPLY&1                                             6  01697  ¤ 01652
```

```
PGLIN   LABEL   OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1142            B      0&X1          RETURN              7  01703  J 000+0
1143    DATA    MLCWS  @N@,PASS1     RESET FIRST PASS INST 12 01710  D 10614 01944 7
1144            BCE    *&13,1264,1   BRCH IF PRIORITY AVAILABLE 12 01722  B 01746 01264 1
1145            MLCWS  @N@,MONITR&7   ALTER PRIORITY INST TO NO-OP 12 01734  D 10614 02108 7
1146            MRCWG  *&9,1230      RESTORE CHANNEL ALTER ROUTINE 12 01746  D 01766 01230 D
                                                                                          L
1147            B      PASS1&7                             7  01758  J 01951
1148            H                                          1  01765  .
1149            DC     @.73@                               3  01768
1150            DCW    @J@                                 1  01769
1151            DC     SCAN                                5  01774  01064
1152            DC     @ @                                 1  01775
1153            DCW    @.@,G                               1  01776
1154            DS     12                                     01789
1155
1156            *** ERROR TABLES THESE ARE USED FOR ERROR ***
1157            *** SUMMARIES AND ERROR INDENTIFICATION ***
1158
1159            ORG    *&X00                                  01800
1160            ORG    *&1                                    01801
                       D
1161    STPTAB  DCW    @L@                                 1  01801
1162    E1      DC     @ @                                 1  01802
1163    E2             @ @                                 1  01803
1164    E3             @ @                                 1  01804
1165    E4             @ @                                 1  01805
1166    E5             @ @                                 1  01806
1167    E6             @ @                                 1  01807
1168    E7             @ @                                 1  01808
1169    E8             @ @                                 1  01809
1170    E9             @ @                                 1  01810
1171    E10            @ @                                 1  01811
1172    E11            @ @                                 1  01812
1173    E12            @ @                                 1  01813
1174    E13            @ @                                 1  01814
1175    E14            @ @                                 1  01815
1176    E15     DC     @ @                                 1  01816
117     E16            @ @                                 1  0181
117     E17            @ @                                 1  0181
1179    E18            @ @                                 1  01819
```

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
1180	E19		â â	1	01820	
1181	E20		â â	1	01821	
1182	E21		â â	1	01822	
1183	E22		â â	1	01823	
1184	E23		â â	1	01824	
1185	E24		â â	1	01825	
1186	E25	DC	â â	1	01826	
1187	E26	DC	â â	1	01827	
1188	E27		â â	1	01828	
1189	E28		â â	1	01829	
1190	E29		â â	1	01830	
1191	E30		â â	1	01831	
1192	E31		â â	1	01832	
1193	E32		â â	1	01833	
1194	E33		â â	1	01834	
1195	E34		â â	1	01835	
1196	E35		â â	1	01836	
1197	E36		â â	1	01837	
1198	E37		â â	1	01838	
1199	E38		â â	1	01839	
1200	E39		â â	1	01840	
1201	E40		â â	1	01841	
1202	E41		â â	1	01842	
1203	E42		â â	1	01843	
1204	E43		â â	1	01844	
1205	E44		â â	1	01845	
1206	E45		â â	1	01846	
1207	E46		â â	1	01847	
1208	E47		â â	1	01848	
1209	E48		â â	1	01849	
1210	E49		â â	1	01850	
1211	E50		â â	1	01851	
1212	E51	DC	â â	1	01852	
1213	E52		â â	1	01853	
1214	E53		â â	1	01854	
1215	E54		â â	1	01855	
1216	E55		â â	1	01856	
1217	E56		â â	1	01857	

```
PGLIN     LABBL     OPCOD  OPERAND          CT  ADDRS  INSTRUCTION
1218      ERRTAB    DC     A*A               1  01858
1219                DC     A A               1  01859
1220
```

```
PGLIN     LABBL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1222                ***  INITIALIZE RCUTINE FOR THE DICOST PROGRAM ***
1223      INITLE    WCP    1250                PRINT TITLE          10  01860  M &TO 01250 W
1224                BCB1   *-16                                      7  01870  R 01860 2
1225                BA1    *&1                                       7  01877  R 01884 M
1226                CS     99                  RESET IND REG S      6  01884  / 00099
1227                SW     25                  SET WM IN IND REG 1  6  01890  , 00025
1228                MLCS   a*a,100             PREPARE TO LOAD 2-15 12  01896  D 10615 00100 3
1229                MRWR   25,30               LOAD IND REG 2-15    12  01908  D 00025 00030 &
1230                MRCWG  RESUME,1            MOVE RESET PROCEDURE 12  01920  D 02015 00001 D
1231                MRCWG  INTR,101            MOVE INTERUPT PROC   12  01932  D 02007 00101 L
1232      PASS1     B      DATA                GO DO  MORE INITIALIZING 7  01944  J 01710
1233           OPT2 CW     NOERSW&1            TURN OFF SWITCHES    6  01951  ¤ 02875
1234                CW     LPRT,SW11&1                              11  01957  ¤ 02799 01549
1235           OPT1 CW     SECSW                                    6  01968  ¤ 02798
1236                CS     E5&                 CLEAR AND RESET      6  01974  / 01857
1237                MLCWS  aLa,STPTAB           ERROR TABLE         12  01980  D 10616 01801 7
1238                B      START               GO TO ROUTINE INIT.  7  01992  J 04123
1239
1240                H                                               1  01999  .
1241                ORG    2000                                        02000
1242                B      INITLE                                   7  02000  J 01860
1243                ***  RESET & INTERUPT ROUTINES,THESE ROUTINES ***
1244                ***  ARE MOVED TO LOCATIONS 1 & 101
1245      INTR      BNQ    PRGCTL              RETURN TO PROG CNTRL 7  02007  J 02285 Q
1246                DCW    aMa                                      1  02014
1247      RESUME    B      CKLUP                                    7  02015  J 02023
1248                DCW    aMa                                      1  02022
1249      CKLUP     BW     MONITR,LPRT         CHECK FOR LOOP ROUT  12  02023  V 02101 02799 1
1250                BW     LOOP,LPINST         CHECK INST LOOP SW   12  02035  V 01013 02800 1
1251                CW     SW11&1,EXTRA&1      CLEAR TYPE SWITCHES  11  02047  ¤ 01549 03252
1252                CW     REPLY&1                                  6  02058  ¤ 01652
1253                CS     E5&                 RESET ERROR TABLE    6  02064  / 01857
1254                MLCWS  aLa,STPTAB                               12  02070  D 10616 01801 7
1255                MLNA   X3,X2               LOAD IX 2            12  02082  D 00039 00034 /
1256                B      MONITR&7            GO TO MONITR         7  02094  J 02108
1257
```

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1259			*** I/O DICOST PROGRAM ***				
1260			*** MONITOR ROUTINE *** .				
1261			THE MONITOR IS ENTERED AFTER EVERY TEST ROUTINE IS COMPLETED,OR				
1262			A STATUS ERROR HAS BEEN DETECTED AND INDICATED.IN THE CASE OF A				
1263			STATUS ERROR MONITOR SIMPLY BRANCHES BACK TO THE POINT AT WHICH				
1264			THE STATUS ERROR WAS DETECTED.WHEN ENTERED FROM THE END OF A				
1265			TEST ROUTINE MONITOR CHECKS TO SEE IF THE CE PRESSED INQUIRY,THE				
1266			ROUTINE IS BEING LOOPED,ANY ERRORS OCCURED ALTER ROUTINE SEQUENCE				
1267			IS SELECTED,OR THE NEXT SEQUENCIAL ROUTINE SHOULD BE RUN.				
1268							
1269	MONITR	SBR	X2	STORE ADDR	7	02101	G 00034 B
1270		BXPA	*&1	EXIT ALERT MODE	7	02108	Y 02115 X
1271		BNQ	PRGCTL	WAS THERE AN INQ	7	02115	J 02285 Q
1272	MONIT1	BW	O&X3,LPRT	RETURN IF LOOPING RT	12	02122	V 000MO 02799 1
1273	MONIT2	MLCWS	@Mq,224	SET WMGM SHORT MESG	12	02134	D 10617 00224 7
1274		B	ERRCTL		7	02146	J 02876
1275	MONIT3	NOP			1	02153	N
1276	OPT1	BW	SEQCTL,SEQSW	GO TO SEQ CONTROL	12	02154	V 03681 02798 1
1277		MLCWA	X2,X3	LOAD IX3	12	02166	D 00034 00039 X
1278		MLCWS	@ @,224	CLEAR WMGM	12	02178	D 10618 00224 7
1279		B	O&X2	GO TO NEXT ROUTINE	7	02190	J 000.0
1280	WHERE2	MLCWS	*-12,224	CLEAR WMGM	12	02197	D 02196 00224 7
1281		BCE	*&8,O&X2,N	BRCH IF ROUT COMP	12	02209	B 02228 000.0 N
1282		B	O&X2	RETURN TO ROUTINE	7	02221	J 000.0
1283		BZN	*&8,1&X2,2	BRCH IF CHAR IS NUMR	12	02228	V 02247 000.1 2
1284		B	O&X2	RETURN TO ROUTINE	7	02240	J 000.0
1285		BZN	*&8,2&X2,2	BRCH IF CHAR IS NUMR	12	02247	V 02266 000.2 2
1286		B	O&X2	RETURN TO ROUTINE	7	02259	J 000.0
1287		BW	MONIT3,3&X2	BRCH IF CHAR HAS WM	12	02266	V 02153 000.3 1
1288		B	O&X2	RETURN TO ROUTINE	7	02278	J 000.0
1289							

```
PGLIN  LABEL    OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1291                    *** I/O DICOST PROGRAM ***
1292                 ***       PROGRAM CONTROL       ***
1293           WHEN THE CE PRESSES INQUIRY TO SELECT A STANDARD PROGRAM OPTION
1294         THIS ROUTINE IS ENTERED.THE CE ENTERS ON THE TYPEWRITER THE
1295         OPTION CODE DESIRED,ALONG WITH THE DATA NEEDED BY THE OPTION.THE
1296         ROUTINE DETERMINES WHICH OPTION HAS BEEN SELECTED AND INITIATES
1297         THE OPTION.
1298
1299    PRGCTL      RCPW   CTLFLD            READ THE CONSOLE PRT             10  02285  L %TO 00201 R
1300                SBR    X1                                                7  02295  G 00029 B
1301                BEX1   PRGCTL,M S        BRCH ON ANY BUT WLR              7  02302  R 02285 S M
1302                SW     CTLFLD&1                                          6  02309  , 00202
1303                BA1    *&1                                               7  02315  R 02322 G M
1304          OPT1  CW     SECSW            TURN OFF SEQ SWITCH              6  02322  ¤ 02798
1305                CW     LPRT,LPINST      TURN OFF LOOP SWS               11  02328  ¤ 02799 02800
1306                MLWS   *,E1             CLEAR WM IN ERROR               12  02339  D 02350 01802 4
1307                MRWR   E1,E2               TABLE                         12  02351  D 01802 01803 %
1308                MLCS   CTLFLD,*&12       MOVE CTL CODE ENTERD            12  02363  D 00201 02386 3
1309                BCE    ENDTST,CTLCOD,    IS CTL CODE BLANK               12  02375  B 09288 02797
1310                BCE    ALTADS            IS CTL CODE 1                    6  02387  B 02436
1311                BCE    ALTMEM            IS CTL CODE 2                    6  02393  B 02459
1312          OPT1  BCE    ALTSEQ           IS CTL CODE 3                     6  02399  B 02506
1313                BCE    LUPRT             IS CTL CODE 4                    6  02405  B 02559
1314                BCE    ONELUP            IS CTL CODE 5                    6  02411  B 02588
1315                BCE    RSTART            IS CTL CODE 6                    6  02417  B 02622
1316                BCE    CONT              IS CTL CODE 7                    6  02423  B 02645
1317                B      PRGCTL                                             7  02429  J 02285
1318    ALTADS      MLCA   CTLFLD&4,1C03     MOVE IN NEW TADS                12  02436  D 00205 01003 T
1319                CS     MONIT1,299        CLEAR OUT CTL FLD               11  02448  / 02122 00299
1320    ALTMEM      MLCA   CTLFLD&5,*&9      MOVE ADDR TO BE ALTR            12  02459  D 00206 02479 T
1321                RCPW   0                 ALTER MEMORY                    10  02471  L %TO 00000 R
1322                BEX1   *-16,M S          CHECK ALL BUT WLR                7  02481  R 02471 S M
1323                BA1    *&1                                               7  02488  R 02495 G M
1324                CS     MONIT1,299        CLEAR THE CNTRL FLD             11  02495  / 02122 00299
1325    ALTSEQ      MLCWS  @Ma,0&X1 G        SET WMGM AT END                 12  02506  D 10617 000*0 7
1326          OPT1  MRCWG  CTLFLD&1,SEQFLD   MOVE CNTRL TO SEQ               12  02518  D 00202 02668 D L
1327          OPT1  SW     SEQSW             TURN ON SEQ SWITCH               6  02530  , 02798
```

```
PGLIN     LABEL     OPCOD  OPERAND                 INSTRUCTION                CT  ADDRS
1328                CPT1 MLNA   SQCON1,X4          LOAD IND REG4              12  02536  D 02773 00044 /
1329                CPT1 CS     MONIT2,299         CLEAR CNTRL FLD            11  02548  / 02134 00299
1330      LUPRT          SW     LPRT               TURN ON LOOP SWITCH         6  02559  , 02799
1331                     MLNA   CTLFLD&5,X2         LOAD IND REG2              12  02565  D 00206 00034 /
1332                     CS     MONIT2,299         CLEAR CNTRL FLD            11  02577  / 02134 00299
1333      CNELUP         SW     LPINST             TURN ON LOOP INST SW        6  02588  , 02800
1334      LUPINT         NOPWM                     THIS SW IS TURNED ON        1  02594  N
1335                     B      *&8                   BY ERRCTL               7  02595  J 02609
1336                     B      PREP               GO TO PREPARE ROUT          7  02602  J 09378
1337                     CW     LUPINT&1           TURN OFF SW                 6  02609  ¤ 02595
1338                     B      LOOP                                           7  02615  J 01013
1339      RSTART         MLNA   CTLFLD&5,X2         LOAD IND REG2              12  02622  D 00206 00034 /
1340                     CS     MONIT2,299         CLEAR CNTRL FLD            11  02634  / 02134 00299
1341      CONT           CS     WHERE2,299         CLR CNTL FLD               11  02645  / 02197 00299
1342
1343                I/O DICOST CONSTANTS
1344      STACNTCPT2 DCW    a0Ca                                               2  02657
1345           CPT2         a0Ca                                               2  02659
1346           CPT2         a0Ca                                               2  02661
1347           CPT2         a0Ca                                               2  02663
1348           CPT2         a0Ca                                               2  02665
1349           CPT2         a0Ca                                               2  02667
1350      SECFLDCPT1 DCW    a a                                                1  02668
1351           CPT1 DC      a                                  a              37  02705
1352           CPT1 DC      a                                  a              37  02742
1353           CPT1 DC      a                        a,G                      25  02767
1354      SQCON1CPT1 DCW    SECFLD                                             5  02773  02668
1355      CMPFLDCPT1 DCW    aN   a                                             4  02777
1356      CODES      DCW    aJ13XRULMa                                         8  02785
1357      MODS       DCW    a4321a                                             4  02789
1358                 DCW    a7a                                                1  02790
1359                 DC     a6a                                                1  02791
1360                        a5a                                                1  02792
1361                        a4a                                                1  02793
1362           CPT1         a3a                                                1  02794
1363                        a2a                                                1    795
1364                        a1a                                                1  02796
```

```
PGLIN     LABEL       OPCOD  OPERAND
1365      CTLCCD               @ @
1366      SEQSW OPT1  DC       @ @
1367      LPRT        DC       @ @
1368      LPINST      DC       @ @
1369      ADDRC2      DCW      ERRTAB              ADDR OF ERR TABLE
1370      ADDRC3OPT2  DCW      STACNT              ADDR OF STATUS TABLE
1371      ERR         DCW      @*ERROR@
1372       ACTION     DC       @REQ ERROR ACTION@,G
1373      ERCODE      DCW      @547P@
1374       SAVIND     DCW      @1 2 4 8 A B@,G
1375       STIND      DC       @1 2 4 8 A B@,G
1376      STACCCOPT2  DCW      @NR@
1377           CPT2   DCW      @BY@
1378           CPT2   DCW      @DC@
1379           CPT2   DCW      @EC@
1380           CPT2   DCW      @NT@
1381           CPT2   DCW      @WL@
1382       NCERSW     DC       @ @
1383
```

```
CT  ADDRS  INSTRUCTION
 1  02797
 1  02798
 1  02799
 1  02800
 5  02805  01858
 5  02810  02657
 6  02816
16  02817
 4  02837
11  02838
11  02850
 2  02863
 2  02865
 2  02867
 2  02869
 2  02871
 2  02873
 2  02874
```

```
PGLIN   LABEL     OPCOD  OPERAND                    CT  ADDRS  INSTRUCTION

1385                  *** I/O DICOST PROGRAM ***
1386              ***      ERROR CONTROL      ***
1387        THIS ROUTINE DETERMINES IF ANY STATUS ERRORS OR PROGRAM DETECT-
1388      ED ERRORS HAVE TO BE INDICATED,IF THERE ARE THIS ROUTINE BUILDS
1389      THE ERROR MESSAGE AND HAS IF TYPED OUT.THIS ROUTINE ALSO CHECKS
1390      TAC 1 TO SEE IF A REQUEST FOR ERROR ACTION SHOULD BE MADE.
1391
1392              LOCATE FAILING INST
1393
1394   ERRCTL     MLCA   X2,X5              LOAD IND REG 5          12  02876  D 00034 00049 T
1395              S      @1@,X5                                     11  02888  S 10619 00049
1396              SCNLA  0&X5,0&X5          SCAN THE ROUTINE        12  02899  D 00**0 00**0 S B
1397              SAR    X5                 STORE CHAR ADDR          7  02911  G 00049 A
1398              MLCS   1&X5,*&12          MOVE CHAR TO BE CHKD    12  02918  D 00**1 02941 3
1399              BCE    GOTONE,CODES,      IS OP CODE M            12  02930  B 02974 02785
1400              BCE                       IS OP CODE L             1  02942  B
1401              BCE    SHORT1             IS OP CODE U             6  02943  B 02993
1402              C      X3,X5              HAS ROUTINE BEEN        11  02949  C 00039 00049
1403              BL     LOOFLD              SEARCHED                7  02960  J 03017 T
1404              B      ERRCTL&12          GO CONTINUE THE SRCH     7  02967  J 02888
1405   GOTONE     MLCWA  10&X5,LOOP&9       LOAD THE LOOP INST      12  02974  D 00*/0 01022 X
1406              B      LOOFLD                                      7  02986  J 03017
1407   SHORT1     MLCWA  5&X5,LOOP&9        LOAD THE LOOP INST      12  02993  D 00**5 01022 X
1408              MLCS   @N@,LOOP           SET NO-OP FOR SHORT     12  03005  D 10614 01013 3
1409                                       INSTRUCTION
1410   LOOFLD     MLCA   LOOP&9,234         MOVE FAILING OPER       12  03017  D 01022 00234 T
1411              MLNA   X3,223             MOVE ADDR OF ROUT       12  03029  D 00039 00223 /
1412         CPT2 SW     NOERSW&1           TURN OFF NO ERR SW       6  03041  , 02875
1413              ZA     ADDR02,X1          LOAD ND REG 1           11  03047  Q M 02805 00029
1414              ZA     @OC209@,X5         LOAD IND REG 5          11  03058  Q M 10624 00049
1415                  SCAN ERROR TABLE & UPDATA ERROR COUNT
1416   ERSCAN     SCNLA  0&X1,0&X1          SCAN THE ERROR TABLE    12  03069  D 000*0 000*0 S B
1417              SAR    X1                 STORE ADDR               7  03081  G 00029 A
1418              BCE    AFTSRH,1&X1,L      HAS TABLE BEEN COMP.    12  03088  B 03170 000*1 D L
1419              SW     X1-1               DEFINE ERROR             6  03100  , 00028
1420              MLNWA  X1,0&X5            MOVE ERROR CODE NO.     12  03106  D 00029 00**0 V
1421         CPT2 A      @1@,1&X1           UPDATE ERROR COUNT      11  03118  A 10619 000*1
```

```
PGLIN     LABEL     OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1422                A      @3@,X5            UPDATE IND REG 5  11  03129  A 10625 00049
1423          OPT2  BCE    SUMARY,1&X1,9     BRCH IF ERROR OCCURED  12  03140  B 04078 000#1 9
1424                                  NINE TIMES
1425                CW     1&X1,X1-1         CLEAR WM S        11  03152  ¤ 000#1 00028
1426                B      ERSCAN                              7  03163  J 03069
1427                    LOAD PRINT FIELD WITH ERROR MESG
1428      AFTSRH    BCE    WHERE2,1000,1     BRCH,NO MESG. IND  12  03170  B 02197 01000 1
1429      ERROSW    NOP                                        1  03182  N
1430                BCE    WHERE2,209        BRCH IF NO ERRORS  12  03183  B 02197 00209
1431                SW     ERROSW&1          RESET ERROR SW     6  03195  , 03183
1432                MLCA   ERR,206           MOVE ERROR        12  03201  D 02816 00206 T
1433                MLCA   2&X3,RCUTIC       MOVE ROUTINE IDENT  12  03213  D 000M2 03242 T
                                                                              Q
1434                B      TYP1              GO TYPE ROUTINE ID  7  03225  J 01593
1435                OCW    @RCUTINE @                            8  03239
1436      ROUTID    DC     @   @,G                              3  03242
1437                B      TYPES                                7  03244  J 01517
1438                    TYPE ADDITIONAL  ERROR INFORMATION
1439      EXTRA     NOPWM                                      1  03251  N
1440                WCP    DATA              PRINT EXTRA DATA  10  03252  M %TO 01710 W
1441                BCB1   *-16                                 7  03262  R 03252 2
                                                                              G
1442                BA1    *&1                                  7  03269  R 03276 M
1443                CW     EXTRA&1                              6  03276  ¤ 03252
1444      ACT       BCE    *&8,1001,1        LOOP ACTION REQUIRED  12  03282  B 03301 01001 1
1445                B      WHERE2                               7  03294  J 02197
1446                SW     LUPINT&1          TURN ON SWITCH     6  03301  , 02595
                                                                              D
1447                MRCWG  ACTION,201        MOVE ACTION MESG  12  03307  D 02817 00201 L
1448                B      TYPES                                7  03319  J 01517
1449                B      PRGCTL                               7  03326  J 02285
```

```
PGLIN    LABEL     OPCOD  OPERAND                  CT  ADDRS  INSTRUCTION

1451                  *** I/O DICOST PROGRAM ***
1452                *** DETERMINE WHICH STATUS INDICATORS ARE ON ***
1453          THIS ROUTINE DETERMINES WHICH STATUS INDICATORS ARE ON.ON THE
1454          CHANNEL BEING USED.THE INDICATORS FOUND  ON ARE STORED IN THE
1455          PRINT FIELD AND THE PROGRAM BRANCHES TO ERROR CONTROL.
1456     STACHK   SBR    X5              STORE ADDR IN IND 5        7  03333  G 00049 B
1457              SBR    X2                                         7  03340  G 00034 B
1458              BW     0&X2,LPRT                                 12  03347  V 000.0 02799 1
1459              S      @7@,X5          REDUCE ADDR BY 7          11  03359  S 10626 00049
1460              MLCS   0&X5,LCOP&IO                              12  03370  D 00**0 01023 3
1461              MRCWG  STIND,237       MOVE STATUS CODES         12  03382  D 02850 00237 DL
1462           CPT2 MLCA  ADDR03,X1      LOAD IND REG 1            12  03394  D 02810 00029 T
1463              MLCS   0&X5,NUOPCO     STORE CHNL CODE           12  03406  D 00**0 03436 3
1464              B      CHALTR                                     7  03418  J 01045
1465              DCW    CNTERR          HIGH LIMIT                5  03429  03591
1466              DC     NOTRDY          LOW LIMIT                 5  03434  03449
1467              DCW    @ @                                       1  03435
1468     NUOPCO   DC     @ @                                       1  03436
1469              DC     @ @                                       1  03437
1470              ZA     @0C237@,X5      LOAD IX 5                11  03438  QM 10631 00049
1471     NOTRDY   NOP
1472              BNR1   CNTERR          CHECK FOR NOT READY       1  03449  N
1473              B      UPIX            GO UPDATE IND REG         7  03450  R 03591 1
1474     BUSY     NOP                                              7  03457  J 03633
1475              BCB1   CNTERR          CHECK FOR BUSY            1  03464  N
1476              B      UPIX            GO UPDATE IND REG         7  03465  R 03591 2
1477     CATACK   NOP                                              7  03472  J 03633
1478              BER1   CNTERR          CHECK DATA CNK            1  03479  N
1479              B      UPIX            GO UPDATE IND REG         7  03480  R 03591 4
1480     EXTCND   NOP                                              7  03487  J 03633
1481              BEF1   CNTERR          CHECK FOR EXT COND        1  03494  N
1482              B      UPIX            GO UPDATE IND REG         7  03495  R 03591 8
1483     NOTRNS   NOP                                              7  03502  J 03633
1484              BNT1   CNTERR          CHECK FOR NO TRANS        1  03509  N
1485              B      UPIX            GO UPDATE IND REG         7  03510  R 03591 SB
1486     WLR      NOP                                              7  03517  J 03633
1487              BWL1   CNTERR          CHECK FOR WLR             1  03524  N
                                                                   7  03527  R 03   -
```

ERROR CONTROL-CHECK STATUS INDICATORS

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1488		B	UPIX	GO UPDATE IND REG	7	03532	J 03633
1489		SW	NOTRDY&1,BUSY&1	RESET INSTRUCTIONS	11	03539	, 03450 03465
1490		SW	DATACK&1,EXTCND&1		11	03550	, 03480 03495
1491		SW	NOTRNS&1,WLR&1		11	03561	, 03510 03525
1492		MRCG	237,SAVIND	SAVE IND	12	03572	D 00237 02838 $
1493		B	ERRCTL	RETURN	7	03584	J 02876
1494	CNTERR	SBR	X6	STORE RETURN ADDR	7	03591	G 00054 B
1495		OPT2 A	@18,0&X1	UPDATE STATUS COUNT	11	03598	A 10619 000#0
1496		A	@78,X6	UPDATE RETURN ADDR	11	03609	A 10626 00054
1497		CW	ERROSW&1	TURN OFF ERROR SW	6	03620	¤ 03183
1498		B	UPIX&19		7	03626	J 03652
1499	UPIX	SBR	X6	STORE RETURN ADDR	7	03633	G 00054 B
1500		MLCS	@ @,0&X5	REMOVE STATUS CHAR	12	03640	D 10618 00##0 3
1501		OPT2 A	@28,X1	UPDATE IND REG 1	11	03652	A 10632 00029
1502		A	@28,X5	UPDATE IND REG 5	11	03663	A 10632 00049
1503		B	0&X6	RETURN TO PROGRAM	7	03674	J 00#.0
1504							

```
PGLIN     LABEL      OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1506           CPT1*** ALTER ROUTINE SEQUENCE ***
1507           CPT1     *** I/O DICOST PROGRAM ***
1508         IF THE ALTER ROUTINE SEQUENCE OPTION HAS BEEN SELECTED,MONITOR
1509       WILL BRANCH TO THIS ROUTINE.THE LIST OF ROUTINE NUMBERS ENTERED
1510       BY THE CE IS EXAMINED AND THE ROUTINES ARE MADE TO RUN IN THE
1511       SEQUENCE SELECTED.WHEN ALL ROUTINES SELECTED HAVE BEEN RUN THE
1512       PROCESS IS REPEATED OR THE ROUTINE GOES TO PROGRAM CONTROL.THIS
1513       IS DETERMINED BY THE LAST CHARACTER ENTERED WHEN THIS OPTION WAS
1514       SELECTED,IF IT IS L THE PROCESS IS REPEATED,IF IT IS E THE PRO-
1515       CESS ENDS AFTER ONE PASS.
1516
1517     SEQCTLCPT1 BCE    PRGCTL,0&X4,E      END OF SEQ CONTROL               12  03681  B 02285 00*00 E
1518           CPT1 BCE    *&8,0&X4,L         SHOULD SEQ BE REPEAT             12  03693  B 03712 00*00 L
1519           CPT1 B      *&13                                                 7  03705  J 03724
1520           CPT1 MLNA   SQCON1,X4          RESET IX4 TO REPEAT              12  03712  D 02773 00044 /
1521           CPT1 MLNS   1&X4,CMPFLC-1      MOVE ROUTINE #                   12  03724  D 00*01 02776 1
1522           CPT1 MLNS                      MOVE ROUTINE #                    1  03736  D
1523           CPT1 A      @3&,X4             UPDATE X4                        11  03737  A 10625 00044
1524           CPT1 MLNA   @099995@,X1        LOAD IX 1                        12  03748  D 10637 00029 /
1525     LOCWM CPT1 SCNLA  0&X1,0&X1          LOOK FOR WM                      12  03760  D 000*0 000*0 S
1526           CPT1 SAR    X1                 STORE ADDR OF OPER                7  03772  G 00029 A
1527           CPT1 BCE    *&8,1&X1,N         IS OP CODE N                     12  03779  B 03798 000*1 N
1528           CPT1 B      LOCWM              GO FIND NEXT OPER                 7  03791  J 03760
1529           CPT1 C      3&X1,CMPFLC-1      IS THIS THE ROUT                 11  03798  C 000*3 02776
1530           CPT1 BE     *&8                IF IT IS BRCH                     7  03809  J 03823 S
1531           CPT1 B      LOCWM              GO FIND NEXT OPER                 7  03816  J 03760
1532           CPT1 BW     *&8,4&X1           BRCH IF THIS IS ROUT             12  03823  V 03842 000*4 1
1533           CPT1 B      LOCWM                                                7  03835  J 03760
1534           CPT1 ZA     X1,X3              LOAD IX 3                        11  03842  M 00029 00039
1535           CPT1 A      @1@,X3             ADJUST ADDR                      11  03853  A 10619 00039
1536           CPT1 B      0&X3               GO TO ROUTINE SELECTED            7  03864  J 000M0
1537
```

```
PGLIN     LABBU     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1539                       *** I/O DICOST PROGRAM ***
1540                    ***      SUMMARY RCUTINE      ***
1541          AFTER A COMPLETE PASS OF THE PROGRAM OR IF THE PROGRAM IS TERM-
1542        INATED THIS ROUTINE ORGANIZES A SUMMARY OF PROGRAM DETECTED
1543        ERRORS AND STATUS ERRORS.IT CAUSES THIS SUMMARY TO BE TYPED AND
1544        BRANCHES TO THE END OF TEST ROUTINES.THIS ROUTINE IS ALSO USED TO
1545        TYPE OUT THE ERROR COUNT IC MESSAGE WHEN A PROGRAM DETECTED ERROR
1546        OCCURES FOR THE TENTH TIME.
1547
1548      SUMIT CPT2 B       TYP1                 GO TYPE ERROR MESG          7  03871  J 01593
1549            CPT2 DCW     @ERR CNT@,G                                      7  03884
1550            CPT2 MLNWA   @01@,CNTMSG-4        LOAD ERR INTO MESG         12  03886  D 10639 03947 V
1551            CPT2 ZA      @OCC01@,X7           LOAD IX 7                  11  03898  M 10644 00059
1552      MOVCNTCPT1 MLNS    STPTAB&X7,CNTMSG     MOVE ERROR COUNT           12  03909  D 01YM1 03951 1
1553            CPT2 C       CNTMSG,@1@           CHECK FOR ERROR            11  03921  C 03951 10619
1554            CPT1 BH      *&15                 ZERO COUNT                  7  03932  J 03953 U
1555            CPT2 B       TYP1                 GO TYPE ERROR MESG          7  03939  J 01593
1556      CNTMSGCPT2 DCW     @      @,G                                       6  03951
1557            CPT2 A       @1@,CNTMSG-4         UPDATE ERROR NUMBER        11  03953  A 10619 03947
1558            CPT2 A       @1@,X7               UPDATE IX 7                11  03964  A 10619 00059
1559            CPT2 C       CNTMSG-4,@51@        HAVE ALL ERRORS BEEN       11  03975  C 03947 10646
1560            CPT2 BE      *&8                     INDICATED                7  03986  J 04000 S
1561            CPT2 B       MOVCNT                                           7  03993  J 03909
1562            CPT2 ZA      @OCOOO@,X7           LOAD IX 7                  11  04000  M 10651 00059
1563      MOVSTCCPT2 MLCA    STACOD&X7,CTMSG2-3   MOVE STATUS CODE           12  04011  D 02YF3 04043 T
1564            CPT2 MLNA    STACNT&X7,CTMSG2     MOVE STATUS ERROR CT       12  04023  D 02WE7 04046 /
1565            CPT2 B       TYP1                                             7  04035  J 01593
1566      CTMSG2CPT2 DCW     @      @,G                                       5  04046
1567            CPT2 A       @2@,X7                                           11  04048  A 10632 00059
1568            CPT2 BCE     ENDTST&12,CTMSG2-4,W HAVE ALL CODES BEN         12  04059  B 09300 04042 W
1569            CPT2 B       MOVSTC                  CHKD                     7  04071  J 04011
1570      SUMARYCPT2 MLNA    X1,MAXMSG-7          MOVE ERROR NUMBER          12  04078  D 00029 04107 /
1571            CPT2 CW      X1-1                 RESET IX REG                6  04090  ¤ 00028
1572            CPT2 B       TYP1                 GO TYPE MESSAGE             7  04096  J 01593
1573      MAXMSGCPT2 DCW     @ERROO CNT 1C@,G                                 12  04114
1574      SUMXITCPT2 B       AFTSRH                                           7  04116  J 03170
1575      CTLFLD     EQU     201
```

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
1576		PST				

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1578	START	SW	CHNLSW&1	TURN ON CHANNEL SW	6	04123	, 07853
1579		MLCA	@OC@,FILE&1	SET ACC & MOD ADDR	12	04129	D 10653 10992 T
1580		MRCWG	INTRET,108	LOAD INTERUPT INST	12	04141	D 10589 00108 D L
1581		SW	FILE&1		6	04153	, 10992
1582		S	DELAY	RESET DELAY	6	04159	S 10550
1583		S	OVLCNT	RESET OVLAP COUNTER	6	04165	S 10545
1584		S	TOTIME	RESET TOTAL TIME CNT	6	04171	S 10320
1585		S	SECFLD-1		6	04177	S 02667
1586		S		RESET ERROR COUNTERS	1	04183	S
1587		S			1	04184	S
1588		S			1	04185	S
1589		S			1	04186	S
1590		S			1	04187	S
1591		B	TYP1	GO TYPE BLANKS	7	04188	J 01593
1592		DCW	@ @,G		4	04198	
1593	TIMEIT	WCP	BLANK	TYPE BLANKS	10	04200	M %TO 10584 W G
1594		BA1	*&1		7	04210	R 04217 M
1595		BCB1	*&8	CONSOLE STILL BUSY	7	04217	R 04231 2
1596		B	GETSET		7	04224	J 04249
1597		A	@317@,TOTIME	KEEP TOTAL TIME	11	04231	A 10656 10320
1598		B	TIMEIT		7	04242	J 04200
1599	GETSET	ZA	@01332@,X10	LOAD IX 10	11	04249	M 10661 00074 Q
16C0		ZA	@0C000@,X15	LOAD IX 15	11	04260	M 10651 00099 Q
16C1		ZA	&N18,X3	LOAD IX3	11	04271	M 10666 00039 Q
16C2		B	N18&10		7	04282	J 07534
16C3							

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1605			*** TEST ROUTINE DESCRIPTION ***				
1606			*** TEST NOT READY ***				
1607							
1608			THIS TESTS THE ABILITY OF THE 7631-1302 TO GIVE A NOT READY				
1609			INDICATION WHEN AN INOPERATIVE ACCESS IS ADDRESSED.EVERY MODULE				
1610			AND ACCESS ARE ADDRESSED UNTIL ONE INDICATES NOT READY.IF NONE				
1611			GIVE A NOT READY IT IS CONSIDERED AN ERROR. NOTE IF MODULES 0-9				
1612			ARE AVAILABLE ON ONE CHANNEL, THE ACCESS ON ONE OF THE MODULES				
1613			MUST BE SET INOPERATIVE BEFORE RUNNING THIS PROGRAM.				
1614							
1615			ONLY THE SEEK OPERATION IS USED IN THIS ROUTINE				
1616							
1617							
1618	NO1	NOP			1	04289	N
1619		DC	@01@	ROUTINE ID	2	04291	
1620	BOTTOM	MLCA	@CCCC@,FILE&5	LOAC FILE ADDRE	12	04292	D 10670 10996 T
1621	TSTRDY	SD	1,FILE	TRY A MOD	10	04304	M %F0 10991 R
1622		BAI	*&1		7	04314	R 04321 M G
1623		BNR1	NOTRDE	BRCH NOT READY	7	04321	R 04393 1
1624		A	@1@,FILE	UPDATE A	11	04328	A 10619 10991
1625		BCE	TSTRDY,FILE,1	BRCH NO ACCESS OVERFLOW	12	04339	B 04304 10991 1
1626		S	@2@,FILE	RESET ACCESS	11	04351	S 10632 10991
1627		A	@1@,FILE&1	ADD 1 TO MOD ADDR	11	04362	A 10619 10992
1628		BZ	*&8	BRCH ON TENTH MOD	7	04373	J 04387 V
1629		B	TSTRDY		7	04380	J 04304
1630		SW	E2	NO ACCESS OR MODULE WAS FOUND	6	04387	, 01803
1631			NOT READY, ERROR 2 IS INDICATED BECAUSE OF THIS. INSURE THAT ONE				
1632			ACCESS IS INOPERATIVE OR SOME MODULE 0-9 IS OFF LINE.				
1633	NOTRDE	MLNS	RDYMSG&14,FILE&1	MOVE MOD ADDR	12	04393	D 07791 10992 1
1634		MLNS	RDYMSG&8,FILE		12	04405	D 07785 10991 1
1635	NO1XIT	B	MONITR		7	04417	J 02101
1636							

```
PGLIN     LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION

1638                    *** TEST ROUTINE DESCRIPTION ***
1639                        *** TEST ACCESS BUSY ***
1640          TWC SUCCESSIVE SEEK OPERATIONS ARE ISSUED TO THE ACCESS BEING
1641        TESTED.AFTER THE 2ND SEEK THE BUSY INDICATOR IS CHECKED.IF BUSY
1642        IS NOT ON ERROR 4 IS INDICATED.A READ HAD OPERATION FOLLOWING THE
1643        TWC SEEKS VERIFIES THAT THE ACCESS ARRIVED AT THE CORRECT LOCA-
1644        TION.ALL COMMON STATUS ERRORS ARE ALSO CHECKED IN THIS ROUTINE.
1645        THE TRACK-HEAD ADDRESS USED IS 9#20  HA1 .
1646
1647
1648      NO2       NOP                                                 1  04424  N
1649                DC      &02@              ROUTINE IT                2  04426
1650                MLCA    &9#20@,FILE&5     RESET ADDRESS            12  04427  D 10674 10996 T
1651                SC      1,FILE            SEEK ACCESS              10  04439  M %F0 10991 R
1652                BCB1    *-16                                        7  04449  R 04439 2
                                                                                  G
1653                BA1     *&1                                         7  04456  R 04463 M
1654                SC      1,FILE            SEEK ACCESS              10  04463  M %F0 10991 R
                                                                                  G
1655                BA1     *&1                                         7  04473  R 04480 M
1656                BCB1    *&7               BRCH BUSY                 7  04480  R 04493 2
1657                    *** SET ERROR 4 ON ***
1658                SW      E4                SET ERROR IND             6  04487  . 01805
1659          THIS ERROR IS SET WHEN BUSY IS NOT TURNED ON BY 2 SUCCESSIVE SKS
1660                MU      %F5,FILE,R        READ & VERIFY ACC        10  04493  M %F5 10991 R
1661                BCB1    *-16                ARRIVAL                 7  04503  R 04493 2
                                                                                  G
1662                BA1     *&1                                         7  04510  R 04517 M
1663                BEX1    STACHK,Y          BRCH ON COND OR NO T      7  04517  R 03333 Y
1664          IF THE ACCESS DID NOT ARRIVE AT THE CORRECT LOCATION THE NO REC-
1665          ORD FOUND WILL CAUSE THE NC TRANSFER AND EXTERNAL CONDITION
1666          STATUS INDICATORS TO COME ON.
1667      NO2XIT      B       MONITR                                      7  04524  J 02101
1668
```

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
1670			*** TEST RCUTINE DESCRIPTION ***			
1671			*** TEST DATA CHECK & EXT CONDITION WHEN CAUSED BY ***			
1672			*** FORMAT CHARACTER CHECK & GAP DETECTORS ***			
1673			A FORMAT IS WRITTEN WITH CNE ILLEGAL CHAR,BLANK,IN THE DATA			
1674			FIELD,AND THE DATA CHECK INDICATOR IS TESTED.IF THERE IS NO DATA			
1675			CHECK,ERROR 5 IS INDICATED.THE DATA FIELD IS RESTORED AND A PRO-			
1676			PER FORMAT IS WRITTEN,BEFORE WRITE CHECKING THE FORMAT THE DATA			
1677			FIELD GAP BEFORE HA2 AREA IS INCREASED BY CNE,THE WRITE DISK CHK			
1678			SHOULD CAUSE A 7631 CKT CHECK EXT COND ,IF IT DOESN T ERROR 6 IS			
1679			INDICATED.THE GAP THAT WAS INCREASED IS REMOVED COMPLETELY AND A			
1680			WRITE CHECK IS ISSUED.IF THERE IS NO RESULTING EXT COND,ERROR 7			
1681			IS INDICATED.THE DATA FIELD IS RESTORED AND A WRITE CHECK INSURES			
1682			THAT THE FORMAT IS CORRECT,A DATA CHECK AT THIS TIME CAUSES ERROR			
1683			8 TO BE INDICATED.			
1684						
1685			THE DATA FIELDS USED ARE AS FOLLOWS ALL SIX BIT MODE			
1686						
1687			WRITE FORMAT WITH ILLEGAL CHAR AS THE 40TH CHAR			
1688			44444433333333333343333333333334 6 BIT MODE HA2 OF 201 CHARS			
1689			WRITE PROPER FORMAT & LAST WRITE CHECK FORMAT			
1690			44444433333333333343333333333334111111111222222222222222211111111			
1691			11111211111111111112111111111111111112			
1692			WRITE CHECK FORMAT WITH GAP LENGTH INCREASED			
1693			44444433333333333343333333333333344 REMAINDER UNCHANGED			
1694			WRITE CHECK FORMAT WITH GAP REMOVED			
1695			44444433333333333343333333333333311 REMAINDER UNCHANGED			
1696						
1697	NO3	NCP		1	04531	N
1698		DC	@03@ ROUTINE ID	2	04533	
1699		CS	DATAFD&299	6	04534	/ 11299
1700		CS		1	04540	/
1701		CS		1	04541	/
1702		MLCS	@1@,DATAFD LOAD	12	04542	D 10619 11000 3
1703		SW	DATAFD&224 6 BIT	6	04554	, 11224
1704		MRC	DATAFD,DATAFD&1 FORMAT	12	04560	D 11000 11001 #
1705		MRCWG	GAP6,DATAFD&224 INTO	12	04572	D 10396 11224 L
1706		MLCA	HAAREA,DATAFD&32 THE DATA FIELD	12	04584	D 1035[illegible] 1103[illegible]

```
PGLIN   LABEL    OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1707             MLCS   @ @,DATAFD&40      SET ILLEGAL FORMAT  12  04596  D 10618 11040 3
1708             MU     %F7,FILE,W          WRITE FORMAT        10  04608  M %F7 10991 W
1709             BCBI   *-16                                     7  04618  R 04608 2
1710             BAI    *&1                                      7  04625  R 04632 4
1711             BERI   FORCHK              BRCH ON DATA CHECK   7  04632  R 04645 4
1712                 *** SET ERROR 5 ON ***
1713             SW     E5                                       6  04639  , 01806
1714       ILLEGAL FORMAT CHAR DION T CAUSE DATA CHECK
1715   FORCHK    MLCS   @1@,DATAFD&40       RESTORE BAD CHAR    12  04645  D 10619 11040 3
1716             MLCA   GAP6,DATAFD&84      PREPARE FIELD FOR A 12  04657  D 10396 11084 T
1717             MRCHG  GAP6,DATAFD&102       A SHORT FORMAT    12  04669  D 10396 11102 L
1718             MU     %F7,FILE,W          WRITE FORMAT        10  04681  M %F7 10991 W
1719             BAI    STACHK              BRCH ON ANY ERROR    7  04691  R 03333 M
1720             MLCS   @4@,DATAFD&33       INCREASE GAP LENGTH 12  04698  D 10675 11033 3
1721             WCC    1,FILE              WRITE DISK CHK WITH 10  04710  M %F3 10991 W
1722             BAI    *&1                  LONG GAP            7  04720  R 04727 M
1723             BEFI   GAPCK               BRCH ON EXT COND     7  04727  R 04740 8
1724                 *** SET ERROR 6 ON ***
1725             SW     E6                  TURN ON ERROR IND    6  04734  , 01807
1726       LONG GAP DION T CAUSE EXT. CONDITION
1727   GAPCK     MLCA   @31@,DATAFD&33      REMOVE GAP COMPLETELY 12  04740  D 10677 11033 T
1728             WCC    1,FILE              WCC WITH A GAP      10  04752  M %F3 10991 W
1729             BAI    *&1                    MISSING           7  04762  R 04769 M
1730             BEFI   TSTWFO              BRCH ON EXT COND     7  04769  R 04782 9
1731                 *** SET ERROR 7 ON ***
1732             SW     E7                  TURN ON ERROR IND    6  04776  , 01808
1733       MISSING GAP DION T CAUSE EXT. CONDITION
1734   TSTWFO    MLCS   @4@,DATAFD&32       RESTORE GAP         12  04782  D 10675 11032 3
1735             WCC    1,FILE              WCC FORMAT          10  04794  M %F3 10991 W
1736             BERI   NO3XIT-6            BRCH ON DATA CHK     7  04804  R 04825 4
1737             BAI    STACHK              BRCH ON ANY ERROR    7  04811  R 03333 M
1738             B      NO3XIT                                   7  04818  J 04831
1739                 *** SET ERROR 8 ON ***
1740             SW     E8                  SET ERROR IND        6  04825  , 01809
1741       PROPERLY WRITTEN FORMAT.CAUSES DATA CHECK WHEN WRITE CHECKED
1742   NO3XIT    B      MONITR                                   7  04831  J 02101
1743
```

```
PGLIN   LABEL   OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1745                ***TEST ROUTINE DESCRIPTION ***
1746            ***TEST DATA CHECK CAUSED BY PARITY,CHAR CODE CHK ***
1747                        *** WRITE DISK CHECK ***
1748          A RECORD IS WRITTEN IN 6 BIT MODE USING THE HAO OP,THIS IS
1749        IS FOLLOWD BY A READ HAO OPERATION,8 BIT MODE,CAUSING PARITY OR
1750        CHAR CODE CHECK IN THE 7631.THE DATA CHECK INDICATOR IS TESTED
1751        ANC IF IT IS NCT ON ERROR 9 IS INDICATED.
1752        THE RECORD IS REWRITTEN IN THE SIX BIT MODE BUT
1753        BBFORE IT IS WRITE CHECKED THE DATA FIELD IN MEMORY IS ALTERED.
1754        THE RECORD IS WRITE CHECKED USING THE ALTERED DATA FIELD AND THE
1755        DATA CHECK IND IS TESTED IF IT ISN T ON ERROR 11 IS INDICATED.
1756
1757        FORMAT REQUIRED IS IN SIX BIT MODE ON CYLINDER 250
1758        444444333333333333433333333333334111111111222222222222222211111111
1759        111112111111111111121111111111111112
1760
1761        DATA FIELD ORGANIZATION
1762        HA2 2 CHAR-REC ADDR 6 CHAR-RECORD 10 CHAR
1763
1764        DATA FIELD USED
1765        88ACCRC1A**---&&&
1766
1767    A04         NCP                                          1  04838  N
1768                DC      &04&              ROUTINE ID         2  04840
1769                CS      DATAFD&299                           6  04841  / 11299
1770                CS                            DATA           1  04847  /
1771                CS                              FIELD        1  04848  /
1772                MRCWG   HACP,DATAFD           LOAD THE      12  04849  D 10398 11000 L
                                                                                          D
1773                MLCWS   &M&,DATAFD&1          SET TERMINATING WMGM  12  04861  D 10617 11001 7
                                  G
1774                MU      %F5,FILE,W            WRITE A RECORD  10  04873  M %F5 10991 W
1775                BAI     *&1                                   7  04883  R 04890 M
                                                                                     G
1776                LU      %F5,FILE,R            READ RECORD IN  10  04890  L %F5 10991 R
1777                BAI     *&1                     WRONG MODE    7  04900  R 04907 M
                                                                                     G
1778                BER1    REWRT                 BRCH ON DATA CHECK  7  04907  R 04920 4
1779                    *** SET ERROR 9 ON ***
1780                SW      E9                    SET ERROR IND   6  04914  . 01810
1781          8 BIT MODE READ OF 6 BIT MODE DATA DOESN T CAUSE DATA CHECK
```

```
PGLIN   LABEL   OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1782    REWRT   MRCWG  HACP,DATAFD                      12  04920  D 10398 11000 DL
1783            MLCWS  @MG,DATAFD&18                    12  04932  D 10617 11018 7
1784            MU     $F5,FILE,W                       10  04944  M $F5 10991 W
1785            BAL    STACHK                            7  04954  R 03333 MG
1786            MLCA   @ @,DATAFD&8                     12  04961  D 10618 11008 T
1787            WDC    1,FILE                           10  04973  M $F3 10991 W
1788            BAL    *&1                               7  04983  R 04990 MG
1789            BERI   NO4XIT                           7  04990  R 05003 4
1790                 *** SET ERROR 11 ON ***
1791            SW     E11                              6  04997  , 01812
1792      $RITE CHECK WITH ALTERED DATA FIELD DOESN T CAUSE DATA CHECK
1793    NO4XIT  B      MONITR                            7  05003  J 02101
1794
```

```
PGLIN   LABEL    OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1796                    *** TEST ROUTINE DESCRIPTION ***
1797            ***TEST EXT CONDITION AND NO TRANSFER CAUSED BY ***
1798              *** INVALID ADDRESS,NO RECORD FOUND & IMPROPER MODE SETTING
1799         A SEEK OP WITH INVALID ADDR 9@80 IS ISSUED.THIS IS FOLLOWED
1800        BY A READ HAD OP.SINCE THE INVALID ADDR SHOULD HAVE CAUSED THE
1801        ACCESS TO REZERO.THE DATA CHECK IND SHOULD BE TURNED ON.IF THE
1802        INDICATOR IS NOT ON ERROR 12 IS INDICATED.THE ACCESS IS RE-POSI-
1803        TIONED TO CYL 253  9#20  AND A READ OP WITH ADDR 9#00 IS ISSUED.
1804        THE NO RECORD FOUND SHOULD TURN ON EXT COND AND NO TRANSFER.IF
1805        EITHER OR BOTH THE INDICATORS DO NOT COME ON ERRORS 13&14 RESP-
1806        ECTFULLY ARE INDICATED.ANOTHER SEEK IS ISSUED FOLLOWED BY A WRITE
1807        DISK CHECK,THIS SHOULD CAUSE IMPROPER MODE SETTING RESULTING IN
1808        AN EXT CONDITION.IF IT DOESN T ERROR 15 IS INDICATED.
1809
1810    N05         NOP                                          1  05010  N
1811                DC      @05@                ROUTINE ID       2  05012
1812                BCE     *&E,SPTAD0,1        CHECK FOR MANUAL MODE  12  05013  B 05032 01004 1
1813                B       RESEEK              BRCH             7  05025  J 05185
1814                B       TYP1                                 7  05032  J 01593
1815                DCW     @TURN OFF CE-WRT SW@,G               18  05056
1816                H                                            1  05058  .
1817                MLCA    @9&80@,FILE&5       SET TKHD ILLEGAL  12  05059  D 10681 10996 T
1818                SD      1,FILE              TRY A SEEK       10  05071  M %F0 10991 R
1819                BCB1    *-16                                 7  05081  R 05071 2
1820                BA1     *&1                                  7  05088  R 05095 G
1821                MLCA    @C000@,FILE&5       RESET TRACK & HEAD  12  05095  D 10670 10996 T
1822                MU      %F5,FILE,R                           10  05107  M %F5 10991 R
1823                BCB1    *-16                                 7  05117  R 05107 2
1824                BA1     *&1                                  7  05124  R 05131 G
1825                BNT1    *&8                 CHEK FOR NO RECORD FOUND  7  05131  R 05145 M
1826                B       *&8                                  7  05138  J 05152  S
1827                BER1    *&7                 CHEK FOR REZERO  7  05145  R 05158 B
1828                    *** SET ERROR 12 ON @@@
1829                SW      E12                 SET ERROR IND    6  05152  . 01813
1830          INVALID ADDRESS DOESN T RESULT IN DATA CHECK
1831                B       TYP1                                 7  05158  J 01593
1832                DCW     @TURN ON CE-WRT SW @,G               18  05182
```

TEST EXTERNAL COND & NO TRANS

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1833		H			1	05184	.
1834	RESEEK	MLCA	@00002@,FILE&5	INSURE FILE ADDR IS RESET	12	05185	D 10670 10996 T
1835		SD	1,FILE	POSITION ACCESS	10	05197	M %F0 10991 R
1836		BCB1	*-16		7	05207	R 05197 2 G
1837		BA1	*&1		7	05214	R 05221 M
1838		MLCA	&9930@,FILE&5	RESET TRACK & HEAD	12	05221	D 10685 10996 T
1839		SD	1,FILE	POSITION ACCESS	10	05233	M %F0 10991 R
1840		BCB1	*-16		7	05243	R 05233 2 G
1841		BA1	*&1		7	05250	R 05257 M
1842		MLCA	@9#20@,FILE&5	RESET ADDRESS	12	05257	D 10674 10996 T
1843		MU	%F5,FILE,R	READ USING INCOR	10	05269	M %F5 10991 R
1844		BCB1	*-16	RECT TKHD ADDR	7	05279	R 05269 2 G
1845		BA1	*&1		7	05286	R 05293 M
1846		BEF1	*&7	BRCH ON EXT COND	7	05293	R 05306 8
1847			*** SET ERROR 13 ON ***				
1848		SW	E13	SET ERROR IND	6	05300	, 01814
1849		NO RECORD FOUND NOT SETTING EXT CONDITION					
1850		BNT1	*&7	BRCH ON NO TRANS.	7	05306	R 05319 S B
1851			*** SET ERROR 14 ON ***				
1852		SW	E14	SET ERROR IND	6	05313	, 01815
1853		NO RECORD FOUND NOT SETTING NO TRANSFER					
1854		SD	1,FILE	POSITION ACCESS	10	05319	M %F0 10991 R
1855		BA1	*&1		7	05329	R 05336 G M
1856		WCC	1,FILE	WRT DISK CHK WITH	10	05336	M %F3 10991 W
1857		BCB1	*-16	IMPROPER MODE SET	7	05346	R 05336 2 G
1858		BA1	*&1		7	05353	R 05360 M
1859		BEF1	NOSXIT	BRCH ON EXT COND	7	05360	R 05373 8
1860			*** SET ERROR 15 ON ***				
1861		SW	E15	SET ERROR IND	6	05367	, 01816
1862		IMPROPER MODE SETTING DOESN T CAUSE EXT CONDITION					
1863	NOSXIT	B	MONITR		7	05373	J 02101
1864							

```
PGLIN    LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1866                     *** TEST ROUTINE DESCRIPTION ***
1867                  *** TEST WRONG LENGTH RECORD LONG AND SHORT ***
1868          A READ WAD WITH A DATA FIELD OF ONE CHARACTER IS ISSUED.THE
1869        WRONG LENGTH RECORD IND. IS CHECKED IF IT IS NOT ON ERROR 16 IS
1870        INDICATED.A READ WAD WITH A DATA FIELD THAT HAS NO TERMINATING
1871        WORD MARK GROUP MARK IS ISSUED. THE WLR INDICATOR IS CHECKED AND
1872        IF IT IS NOT ON ERROR 17 IS INDICATED.
1873
1874        FORMAT REQUIRED IS IN SIX BIT MODE ON CYLINGER 253
1875        4444443333333333334333333333333341111111111 REC ADDR & REC
1876        DATA FIELD USED FOR SHORT RECORD 8
1877
1878        DATA FIELD USED FOR LONG RECORD,FROM START OF DATA FIELD TO THE
1879        END OF MEMORY
1880      NO6         NOP                                          1  05380  N
1881                  DC      @06@                 ROUTINE ID      2  05382
1882                  MLCWS   @M@,DATAFD&1                        12  05383  D 10617 11001 7
1883                  MU      %F5,FILE,R           READ WITH W.L.R. 10  05395  M %F5 10991 R
1884                  BCBI    *-16                      RECORD SHORT 7  05405  R 05395 2
1885                  BAI     *&1                                    7  05412  R 05419 M
1886                  BWLI    *&7                  BRCH ON W.L.R.    7  05419  R 05432 -
1887                      *** SET ERROR 16 ON ***
1888                  SW      E16                  SET ERROR IND.    6  05426  , 01817
1889        SHORT DATA FIELD DOESN T CAUSE WRONG LENGTH RECORD
1890                  CS      DATAFD&299           CLEAR             6  05432  / 11299
1891                  CS                                DATA        1  05438  /
1892                  CS                                     FIELD  1  05439  /
1893                  MU      %F5,FILE,$           READ TO END OF MEM 10  05440  M %F5 10991 $
1894                  BAI     *&1                       RECORD LONG  7  05450  R 05457 M
1895                  BWLI    *&7                  BRCH ON W.L.R.    7  05457  R 05470 -
1896                      *** SET ERROR 17 ON ***
1897                  SW      E17                  SET ERROR IND.    6  05464  , 01818
1898        LONG DATA FIELD DOESN T CAUSE WRONG LENGTH RECORD
1899      NO6XIT      B       MONITR                                 7  05470  J 02101
1900
```

```
PGLIN     LABEL     OPCOD  OPERAND                  INSTRUCTION                    CT  ADDRS
1902                       *** TEST ROUTINE DESCRIPTION ***
1903                         *** RANDOM SEEK TEST ***
1904          USING A FOUR DIGIT NUMBER,DEVELOPED FROM THE TIME TAKEN FOR THE
1905        CARRIAGE ON THE TYPEWRITER TO RETURN,RANDOM ADDRESSES ARE GENER-
1906        ATED FOR THE FILE.A SEEK IS ISSUED FOR EACH ADDRESS AND ARRIVAL
1907        OF THE ACCESS IS VERIFIED BY A READ HAD OP.IF THE READ OP RESULTS
1908        IN A NO RECORD FOUND,ERROR 1 IS INDICATED FOLLOWED BY THE FILE
1909        ADDRESS BEING USED.ANY STATUS INDICATORS ENCOUNTERED BY THE SEEK
1910        OR READ OPS WILL ALSO BE INDICATED.IF THE PROGRAM IS IN THE MAN-
1911        UAL MODE,A NO RECORED FOUND ON THE READ OP WILL CAUSE A REQUEST T
1912        TURN ON THE CE-HAD SO THAT THE ADDRESS AT WHICH THE ACCESS
1913        ACTUALLY ARRIVED AT CAN BE DISPLAYED FOR ANALYSIS.100 SEEKS ARE
1914        MADE IN THE ROUTINE,AFTER WHICH THE ACCESS IS POSITIONED AT THE
1915        DIAGNOSTIC CYL 250.IF BOTH ACCESSES ON A MODULE ARE READY THEY
1916        WILL BOTH BE USED IN THIS ROUTINE.
1917
1918      NO7       NOP                                                          1  05477  N
1919                DC        @07@           ROUTINE ID                          2  05479
1920                SW        FILE&2                                             6  05480  , 10993
1921                MLNWA     TOTIME,FILE&5  MOVE IN RANDOM ADDR                12  05486  D 10320 10996 V
1922      SEEKS     SD        1,FILE         MOVE THE ACCESS                    10  05498  M %F0 10991 R  SEEK
1923                BCB1      *-16                                               7  05508  R 05498 2
1924                BAI       *&1                                                7  05515  R 05522 G M
1925                BNR1      RANDOM                                             7  05522  R 05560 1
1926                MU        %F5,FILE,R     VERIFY ACCESS ARRIVL               10  05529  M %F5 10991 4  - HAD READ
1927                BCB1      *-16                                               7  05539  R 05529 2
1928                BEX1      VERROR,Y       BRCH ON COND ON NOT                7  05546  R 05641 Y
1929                BAI       *&1                                                7  05553  R 05560 G M
1930      RANDOM    A         @300@,TOTIME   INCREASE VARIABLE BY               11  05560  A 10688 10320
1931                A         TOTIME,FILE&5    300 AND ADD TO ADR               11  05571  A 10320 10996
1932                A         @1@,FILE       UPDATE ACCESS ADDRESS              11  05582  A 10619 10991
1933                BCE       SEEKS,FILE,1   BRCH IF NO ACCESS OVERFLOW         12  05593  B 05498 10991 1
1934                S         @2@,FILE       RESET ACCESS                       11  05605  S 10632 10991
1935                A         @1@,COUNT      ADD 1 TO PASS COUNT                11  05616  A 10619 10552
1936                BZ        ENDSKS         BRCH ON 101 PASS                    7  05627  J 05792 V
1937                B         SEEKS                                              7  05634  J 05498
1938                      *** SET ERROR 1 ON ***
```

```
PGLIN    LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1939     VERROR    SW     E1,EXTRA&1          SET ERROR            11  05641  , 01802 03252
1940       ON A RANDOM SEEK ACCESS POSITION RESULTED IN A NO RECORD FOUND
1941               MRCWG  FILE,DATA           MOVE FAILING ADDR    12  05652  D 10991 01710 DL
1942               BAL    STACHK              GO TO STATUS CHECK    7  05664  R 03333 GM
1943               BCE    *&8,SPTADD,1        BRCH IF IN MANUAL MD 12  05671  B 05690 01004 1
1944               B      RANDOM              GO TRY NEXT SEEK      7  05683  J 05560
1945               B      TYP1                GO REQUEST THAT CE-HAD 7 05690  J 01593
1946               DCW    @CE-HAD ON@,G         BE TURNED ON        9  05705
1947               H                          WAIT FOR ACTION       1  05707  .
1948               MU     %F5,FILE,R          READ IN TKHD ADDR    10  05708  M %F5 10991 R
1949               BCB1   *-16                                      7  05718  R 05708 2
1950               BAL    *&1                                       7  05725  R 05732 GM
1951               SW     DATAFD                                    6  05732  . 11000
1952               MLCA   DATAFD&6,ADRMSG&16  MOVE ADDR READ BACK  12  05738  D 11006 05773 T
1953               B      TYP1                GO TYPE ADDR          7  05750  J 01593
1954     ADRMSG    DCW    @ADDR READ          .CE-HAD OFF@,G       28  05757
1955               H      RANDOM              WAIT FOR ACTION       6  05786  . 05560
1956     ENDSKS    MLNA   @9#20@,FILE&5       RESET ADDRESS        12  05792  D 10674 10996 /
1957               MLNS   RDYMSG&8,FILE        RESTORE ACCESS ADDRESS 12 05804  D 07785 10991 1
1958               SD     1,FILE              POSITION ACCESS      10  05816  M %F0 10991 R
1959               BCB1   *-16                                      7  05826  R 05816 2
1960               BAL    *&1                                       7  05833  R 05840 GM
1961     NO7XIT    B      MONITR              GO TO MONITOR         7  05840  J 02101
1962
```

```
PGLIN    LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1964                  *** TEST ROUTINE DESCRIOPTION ***
1965                   *** TEST WRITE 6 BIT MODE FORMAT ***
1966           THIS ROUTINE WRITES A SHORT FORMAT FOR CYL 250 IN THE 6 BIT
1967         MODE.THE FORMAT IS WRITE CHECKED AND IF A DATA CHECK RESULTS,
1968         ERR 18 IS INDICATED.IN ADDITION ANY STATUS INDICATORS ENCOUNT-
1969         ERED BY THE WRITE FORMAT,OR THE WRITE CHECK,WILL BE DISPLAYED IN
1970         THE ERROR TYPEOUT.
1971
1972         FORMAT WRITTEN ON CYL 250 IN 6 BIT MODE
1973         &444443333333333334333333333333341111111112222222222222221111111
1974         1111121111111111112111111111111111111222222222222222211111111111112
1975         1111111111112111111111111111111222222222222222111111111111211111
1976         111111112111111111111111111111111111111111111111111111111111111111
1977         11111111112
1978
1979         ORGANIZATION OF FORMAT
1980         GAP1--HA1--GAP2--HA2 9CHARS--X GAP--REC ADDR 1OCHAR--Y GAP--REC
1981         AREA 14CHARS--X GAP--REC ADDR 1OCHARS--Y GAP--REC AREA 14CHARS--
1982         REC ADDR 1OCHARS--X GAP--REC AREA 64CHARS--GAP3
1983   NO8       NOP                                                1  05847  N
1984             DC     @08@              ROUTINE ID                2  05849
1985             CS     DATAFD&399                                  6  05850  / 11399
1986             CS                             DATA                1  05856  /
1987             CS                                FIELD            1  05857  /
1988             CS                                                 1  05858  /
1989             MLCS   @1@,DATAFD        LOAD                     12  05859  D 10619 11000 3
1990             MLCA   @9%20@,FILE&5     RESET ADDRESS            12  05871  D 10674 10996 T
1991             SW     DATAFD&272                                  6  05883  , 11272
1992             MRN    DATAFD,DATAFD&1     FORMAT                  12  05889  D 11000 11001 9
1993             MLNA   HAAREA,DATAFD&32     SIX BIT                12  05901  D 10353 11032 /
1994             MLNA   GAP6,DATAFD&84        MODE FOR               12  05913  D 10396 11084 /
1995             MLNA   GAP6,DATAFD&144    THREE RECORDS             12  05925  D 10396 11144 /
1996             MLNA   GAP6,DATAFD&204     AND RECORD ADDRESSES      12  05937  D 10396 11204 /D
1997             MRCWG  GAP6,DATAFD&272              REC ADDR         12  05949  D 10396 11272 L
1998             MU     %F7,FILE,W        WRITE THE FORMAT           10  05961  M %F7 10991 W
1999             BCB1   *-16                                         7  05971  R 05961 2G
2000             BAI    STACHK            BRCH ON ANY ERROR        7  05978  R 03333 M
```

```
                    TEST WRITE FORMAT 6 BIT MODE
PGLIN     LABEL     OPCOD  OPERAND
2001                WDC    1,FILE              WRT DISK CHK
2002                BAL    @&1
2003                BER1   @&8                  BRCH ON DATA CHK
2004                B      NOBXIT
2005                     @@@ SET ERROR 18 ON @@@
2006                SW     E18                 SET ERROR IND
2007          WRITE CHECK OF THE FORMAT RESULTS IN A DATA CHECK
2008      NOBXIT    B      MONITR
2009
```

```
CT  ADDRS  INSTRUCTION
10  05985  M %F3 10991 W
                      G
 7  05995  R 06002 M
 7  06002  R 06016 4
 7  06009  J 06022

 6  06016  , 01819

 7  06022  J 02101
```

```
PGLIN    LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2011                  *** TEST ROUTINE DESCRIPTION ***
2012                *** TEST READ&WRITE IN 6 BIT MODE ***
2013          A TRACK OF 100 CHARACTERS IS WRITTEN.THE TRACK IS WDC,READ INTO
2014         MEMORY AND COMPARED TO THE ORIGINAL DATA THAT WAS WRITTEN.IF THE
2015         WRITE CHECK TURNS ON DATA CHECK ERROR 19 IS INDICATED.IF THE READ
2016         DATA DOES NOT COMPARE WITH THE WRITE DATA,ERROR 20 IS INDICATED.
2017         ANY STATUS INDICATORS ENCOUNTERED WILL BE DISPLAYED.THE TEST IS
2018         REPEATED 40 TIMES,ONCE FOR EACH HEAD ON THE ACCESS AT CYL 250
2019
2020         FORMAT REQUIRED SAME AS THE FORMAT DESCRIBED IN ROUTINE NO8
2021
2022         DATA FIELD ORGANIZATION
2023         HA2 2CHARS--REC ADDR 6CHARS--RECORD 10CHARS--REC ADDR 6CHARS--
2024         RECORD 10CHARS--REC ADDR 6CHARS--RECORD 60CHARS
2025         DATA FIELD USED
2026         @8ADDR01###---&&& ADDR0212488421  ADDR03.¤  $*   -/,%  *@@   &ABC
2027         DEFGHI-JKLMNOPQR*STUVWXYZ035679
2028
2029    NO9      NOP
2030             DC      @09@              ROUTINE ID                        1  06029  N
2031             MLCA    @9*20@,FILE&5     RESET ADDRESS                     2  06031
2032             B       *&30                                               12  06032  D 10674 10996 T
2033    CHKHDS   SW      FILE&4                                              7  06044  J 06080
2034             A       @1@,FILE&5        UPDATE TKHD ADDR                  6  06051  , 10995
2035             BCE     NO9XIT,FILE&4,6   BRCH IF CYL COMPLETE             11  06057  A 10619 10996
2036             CS      DATAFD&225        CLEAR                            12  06068  B 06227 10995 6
2037             CS                              DATA                        6  06080  / 11225
2038             CS                                   FIELD                  1  06086  /
2039             MRCWG   HACP,DATAFD       LOAD THE DATA FIELD               1  06087  /                D
2040             MU      *F5,FILE,W        WRITE THE RECORDS                12  06088  D 10398 11000  L
2041             BAI     STACHK            BRCH ON ANY ERROR                10  06100  M *F5 10991 W
2042             WDC     1,FILE            WRITE CHECK THE DATA              7  06110  R 03333 M
2043             BERI    *&15              BRCH ON DATA CHK                 10  06117  M *F3 10991 W
2044             BAI     STACHK            BRCH ON ANY ERROR                 7  06127  R 06148 4
2045             B       RDCHK6                                              7  06134  R 03333 M
2046                  *** SET ERROR 19 ON ***                                7  06141  J 06154
2047             SW      E19               SET ERROR IND
                                                                            6  06148  , 01820
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2048          WRITE CHECK OF RECORD RESULTS IN DATA CHECK
2049      RDCHK6    MRCG   DATAFD,DATAFD&101   SAVE DATA WRITTEN    12  06154  D 11000 11101 $
2050                CS     DATAFD&99           CLEAR DATA FIELD      6  06166  / 11099
2051                MU     %F5,FILE,R          READ DATA BACK       10  06172  M %F5 10991 R
2052                BAI    STACHK              BRCH ON ANY ERROR     7  06182  R 03333 M
                                                                               G
2053                C      DATAFD&200,DATAFD&99  CHECK DATA READ    11  06189  C 11200 11099
2054                BE     CHKHDS              IF IT IS GOOD BRCH    7  06200  J 06051 S
2055                     *** SET ERROR 20 ON ***
2056                SW     E20                 SET ERROR IND         6  06207  , 01821
2057          READ DATA DOES NOT COMPARE WITH ORIGINAL WRITE DATA
2058                B      MONITR              GO REPORT ERROR       7  06213  J 02101
2059                B      CHKHDS               RETURN HERE          7  06220  J 06051
2060      NO9XIT    B      MONITR                                    7  06227  J 02101
2061
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

2063                   *** TEST ROUTINE DESCRIPTION ***
2064                 *** TEST WRITE FORMAT 8 BIT MODE ***
2065          THIS ROUTINE WRITES A SHORT FORMAT FOR CYL 250 IN 8 BIT MODE.
2066          THE FORMAT IS WRITE CHECKED AND IF A DATA CHECK RESULTS, ERROR 21
2067          IS INDICATED.ANY STATUS INDICATORS THAT ARE ENCOUNTERED WILL BE
2068          DISPLAYED IN THE ERROR MESSAGE.
2069
2070          FORMAT WRITTEN ON CYL 250 IN 8 BIT MODE
2071          4444443333333333334333333333333334333333333444444444444444433333333
2072          3333343333333333333433333333333333333344444444444444443333333333333
2073          4333333333333343333333333333333334444444444444444333333333333343333
2074          3333333334333333333333333333333333333333333333333333333333333333333
2075          3333333333334
2076          ORGANIZATION OF FORMAT
2077          GAP1--HA1--GAP2--HA2 9CHARS--X GAP--REC ADDR 10CHAR--Y GAP--REC
2078          AREA 14CHARS--X GAP--REC ADDR 10CHARS--Y GAP--REC AREA 14CHARS--
2079          REC ADDR 10CHARS--X GAP--REC AREA 64CHARS--GAP3
2080     N1C  NOP                                                    1  06234  N
2081          DC        @1C@              ROUTINE ID                 2  06236
2082          CS        DATAFD&399        CLEAR                      6  06237  / 11399
2083          CS                          DATA                       1  06243  /
2084          CS                              FIELD                  1  06244  /
2085          CS                                                     1  06245  /
2086          MLCS      @3@,DATAFD        LOAD                      12  06246  D 10625 11000 3
2087          MLCA      @9*20@,FILE&5     RESET TRACK & HEAD ADDRESS 12  06258  D 10674 10996 T
2088          SW        DATAFD&277        THE                        6  06270  . 11277
2089          MRN       DATAFD,DATAFD&1     FORMAT                  12  06276  D 11000 11001 9
2090          MLNA      HAAREA,DATAFD&32      EIGHT BIT             12  06288  D 10353 11032 /
2091          MLNA      GAP8,DATAFD&84          MODE FOR            12  06300  D 10541 11084 /
2092          MLNA      GAP8,DATAFD&144   THREE RECORDS             12  06312  D 10541 11144 /
2093          MLNA      GAP8,DATAFD&204    AND RECORDS  ADDRESSES   12  06324  D 10541 11204 /
2094          MRCHG     GAP8,DATAFD&272                 RECORD ADDRESSES 12  06336  D 10541 11272 L
2095          MU        *F7,FILE,W        WRITE THE FORMAT          10  06348  M *F7 10991 W
2096          BAI       STACHK            BRCH ON ANY ERROR          7  06358  R 03333 M
2097          WCC       1,FILE            WRITE CHECK FORMAT        10  06365  M *F3 10991 W
2098          BAI       *&1                                          7  06375  R 06382 M
2099          BER1      *&8               BRCH ON DATA CHK           7  06382  R 06396 4
```

TEST WRITE FORMAT 8 BIT MODE DC02 PAGE 113

```
PGLIN     LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION
21C0                8      NICXIT                                      7  06389  J 06402
21C1                    *** SET ERROR 21 ON ***
21C2                SW     E21                    SET ERROR IND        6  06396  , 01022
21C3      WRITE CHECK OF THE FORMAT RESULTS IN A DATA CHECK
21C4      NICXIT    8      MONITR                                      7  06402  J 02101
21C5
```

```
PGLIN   LABEL   OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2107                  *** TEST ROUTINE DESCRIPTION ***
2108                *** TEST READ&WRITE TN 8 BIT MODE ***
2109          A RECORD OF 100 CHARACTERS,HA2 & 3 RECORDS & 3 RECORD ADDRESSES
2110        .IS WRITTEN USING HAO IN 8 BIT MODE.IT IS WRITE CHECKED,READ BACK
2111        INTO MEMORY,AND COMPARED AGAINST THE ORIGINAL DATA WRITTEN.IF
2112        THE WRITE CHECK RESULTS IN DATA CHECK,ERROR 22 IS INDICATED.IF
2113        THE READ DATA DOES NOT COMPARE TO THE WRITE DATA ERROR 24 IS
2114        INDICATED.SINCE THE RECORD IS WRITTEN AND READ IN 8 BIT MODE THE
2115        READ DATA IS CHECKED FOR A WORD MARK IN A FIXED LOCATION. IF THE
2116        WORD MARK IS NOT THERE ERROR 23 WILL BE INDICATED.ANY STATUS
2117        ERROR WILL ALSO BE INDICATED.THE TEST IS REPEATED 40 TIMES,ONCE
2118        FOR EACH HEAD ON THE ACCESS AT CYL 250
2119
2120        FORMAT REQUIRED SAME AS THE FORMAT DESCRIBE IN ROUTINE N10
2121
2122        DATA FIELD ORGANIZATION
2123        HA2 2CHARS--REC ADDR 6CHARS--RECORD 10CHARS--REC ADDR 6CHARS--
2124        RECORD 10CHARS--REC ADDR 6CHARS--RECORD 60CHARS
2125        DATA FIELD USED
2126        @8ADDRC1###----&&& ADDR0212488421  ADDR03.¤  $*   -/,%  *#@   &ABC
2127        DEFGHI-JKLMNOPQR#STUVWXYZ035679
2128
2129  N11   NOP                                                        1  06409  N
2130        DC      @11@              ROUTINE ID                     2  06411
2131        MLCA    @9*20@,FILE&5     RESET TRACK & HEAD ADDRESS     12  06412  D 10674 10996 T
2132        CS      DATAFD&299        CLEAR                          6  06424  / 11299
2133        CS                              DATA                     1  06430  /
2134        CS                                   FIELD               1  06431  /
2135        MRCWG   MACP,DATAFD       LOAD THE DATA FIELD            12  06432  D 10398 11000 D
                                                                                                L
2136        LU      %F5,FILE,W        WRITE THE DATA                 10  06444  L %F5 10991 W
2137        BA1     STACHK            BRCH ON ANY ERROR               7  06454  R 03333 M
                                                                                          G
2138        LU      %F3,FILE,W        WRITE CHECK THE DATA           10  06461  L %F3 10991 W
2139        BER1    *&15              BRCH ON DATA CHECK              7  06471  R 06492 4
2140        BA1     STACHK                                            7  06478  R 03333 M
                                                                                          G
2141        B       RDCHK8                                            7  06485  J 06498
2142                *** SET ERROR 22 ON ***
2143        SW      E22               SET ERROR IND                  6  06492  , 01823
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2144                 WRITE CHECK OR RECORD RESULTS IN A DATA CHECK
2145      RDCHK8     MRCG   DATAFD,DATAFD&101  SAVE DATA WRITTEN     12  06498  D 11000 11101 6
2146                 CS     DATAFD&99          CLEAR DATA FIELD       6  06510  / 11099
2147                 LU     %F5,FILE,R         READ DATA BACK        10  06516  L %F5 10991 R
2148                 BA1    STACHK             BRCH ON ANY ERROR      7  06526  R 03333 GM
2149      CHKWK      BW     *&7,DATAFD&2       CHECK MCRD MARKS      12  06533  V 06551 11002 1
2150                     *** SET ERROR 23 ON ***
2151                 SW     E23                SET ERROR IND          6  06545  . 01824
2152                 WORD MARK MISSING FROM READ DATA
2153      DATCK8     C      DATAFD&200,DATAFD&99  CHECK DATA READ     11  06551  C 11200 11099
2154                 BE     *&7                IF IT IS GOOD BRCH     7  06562  J 06575 S
2155                     *** SET ERROR 24 ON ***
2156                 SW     E24                SET ERROR IND          6  06569  . 01825
2157                 READ DATA DOES NOT COMPARE TO WRITE DATA
2158      N11XIT     B      MONITR                                    7  06575  J 02101
2159                     ALTER ADDRESS BY 1 UNTIL EVERY HEAD
2160                     IS SELECTED AND TESTED IN 8 BIT MODE
2161      N12        NOP                                              1  06582  N
2162                 DC     @12@               ROUTINE ID             2  06584
2163                 SW     FILE&4                                    6  06585  . 10995
2164                 A      @1@,FILE&5         UPDATE TKHD ADDR      11  06591  A 10619 10996
2165                 BCE    N12XIT,FILE&4,6    BRCH IF CYL COMPLETE  12  06602  B 06632 10995 6
2166                 ZA     &N11,X3            LOAD IX 3             11  06614  MQ 10693 00039
2167                 B      N11&15                                    7  06625  J 06424
2168      N12XIT     B      MONITR                                    7  06632  J 02101
2169
```

```
PGLIN    LABEL    OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

2171                  *** TEST ROUTINE DESCRIPTION ***
2172                *** TEST FULL TRACK WITH ADDRESSES OPERATION ***
2173          A DATA FIELD OF 3 RECORDS AND ADDRESSES IS WRITTEN IN THE 8 BIT
2174        MODE USING WFT ON CYL 250 ADDR 9#20.THE DATA IS READ
2175        BACK IN 8 BIT MODE USING THE RFT OP AND THE DATA READ IS COMPARED
2176        IN MEMORY WITH THE DATA WRITTEN.IF THE DATA DOESN T COMPARE ERROR
2177        25 IS INDICATED.STATUS ERRORS  ARE ALSO INDICATED.
2178
2179        FORMAT REQUIRED IS THE SAME AS DESCRIBED IN ROUTINE N10
2180
2181        DATA FIELD ORGANIZATION
2182        REC ADDR 6CHARS--RECORD 10CHARS--REC ADDR 6CHARS--RECORD 10CHARS-
2183        -REC ADDR 6CHARS--RECORD 60CHARS
2184
2185        DATA FIELD USED
2186        ADDR01###---&&& ADDR0212488421  ADDR03.¤  $*   -/,%  ##@   &ABCDE
2187        FGHI-JKLMNOPQR#STUVWXYZ035679
2188
2189    N13         NOP                                          1  06639  N
2190                DC     @13@              ROUTINE ID          2  06641
2191                CS     DATAFD&299        CLEAR               6  06642  / 11299
2192                CS                            DATA          1  06648  /
2193                CS                               FIELD      1  06649  /
2194                MRCG   ADDR1-5,DATAFD    LOAD DATA FIELD    12  06650  D 10400 11000 $
2195                SW     DATAFD&98         SET WM OVER GM      6  06662  , 11098
2196                MLCA   @9#20@,FILE&5     RESET TRACK ADDRESS 12  06668  D 10674 10996 T
2197                LU     %F6,FILE,W        WRITE TRK WITH ADDRS 10  06680  L %F6 10991 W
2198                BAI    STACHK            BRCH ON ANY ERROR   7  06690  R 03333 GM
2199                MRCG   DATAFD,DATAFD&99  SAVE DATA           12  06697  D 11000 11099 $
2200                CS     DATAFD&97                             6  06709  / 11097
2201                LU     %F6,FILE,R        READ TRK WITH ADDR  10  06715  L %F6 10991 R
2202                BAI    STACHK            BRCH ON ANY ERROR   7  06725  R 03333 GM
2203                C      DATAFD&97,DATAFD&196  CHECK DATA READ 11  06732  C 11097 11196
2204                BE     *&7               IF IT IS GOOD BRCH  7  06743  J 06756 S
2205                    *** SET ERROR 25 ON ***
2206                SW     E25               SET ERROR IND       6  06750  , 01826
2207        READ DATA DOES NOT COMPARE WITH DATA WRITTEN
```

TEST FULL TRACK WITH ADDRESSES DC02 PAGE 117

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
2208	N13X1T	B.	MONITR	7	06756	J 02101

```
RGLIN  LABEL   OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2210                  *** TEST ROUTINE DESCRIPTION ***
2211                *** TEST FULL TRACK WITHOUT ADDRESSES OPERATION ***
2212          A DATA FIELD OF 3 RECORDS IS WRITTEN IN 8 BIT MODE USING THE
2213        WOT OP ON CYL 250 ADDR 9820.THE DATA IS READ BACK USING RDT
2214        OP AND THE DATA READ IS COMPARED AGAINST THAT WHICH WAS WRITTEN.
2215        IF THE DATA DOES NOT COMPARE ERROR 26 IS INDICATED.ALL STATUS
2216        ERRORS ENCCUNTERED ARE ALSC INDICATED.
2217
2218        FORMAT REQUIRED IS THE SAME AS DESCRIBED IN ROUTINE N10
2219
2220        DATA FIELD ORGANIZATION
2221        RECORD 10CHARS--RECORD 10CHARS--RECORD 60CHARS
2222        DATA FIELD USED
2223        $$$-.-&&& 12488421 .¤  $*   -/,%  **@   &ABCDEFGHI-JKLMNOPQR*STU
2224        VWXYZ035679
2225
2226  N14   NOP                                                      1  06763  N
2227        DC     @14@              ROUTINE ID                     2  06765
2228        CS     DATAFD&299        CLEAR                          6  06766  / 11299
2229        CS                             DATA                     1  06772  /
2230        CS                                 FIELD                1  06773  /
2231        MRCG   ADDR1&1,DATAFD    LOAD DATA FIELD                12  06774  D 10406 11000 $
2232        MRCG   ADDR2&6,DATAFD&10  LOAD                          12  06786  D 10422 11010 $
2233        MRCWG  ADDR3&6,DATAFD&20      DATA FIELD                12  06798  D 10438 11020 L
2234        MLCA   @9*20@,FILE&5     RESET ADDRESS                  12  06810  D 10674 10996 T
2235        LU     %F2,FILE,W        WRITE FULL TRACK               10  06822  L %F2 10991 W
2236        BAI    STACHK            BRCH ON ANY ERROR               7  06832  R 03333 M
2237        MRCG   DATAFD,DATAFD&81  SAVE DATA                       12  06839  D 11000 11081 $
2238        CS     DATAFD&79         CLEAR STORAGE                  6  06851  / 11079
2239        LU     %F2,FILE,R        READ TRACK                     10  06857  L %F2 10991 R
2240        BAI    STACHK                                           7  06867  R 03333 M
2241        C      DATAFD&79,DATAFD&160  CHECK DATA READ            11  06874  C 11079 11160
2242        BE     *&7               IF IT IS GOOD BRCH             7  06885  J 06898 S
2243                  *** SET ERRCR 26 ON ***
2244        SW     E26                                              6  06892  , 01827
2245        READ DATA DOES NOT COMPARE WITH DATA WRITTEN
2246  N14XIT  B      MONITR                                         7  06898  J 02101
```

TEST FULL TRACK WITHOUT ADDRESSES

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2248                   *** TEST ROUTINE DESCRIPTION ***
2249                 *** TEST SINGLE RECORD OPERATION ***
2250          IN THE EIGHT BIT MODE A SINGLE RECORD OF 10 CHARACTERS IS WRIT-
2251        TEN,ADDRESS-ADDR01.IF NO RECORD FOUND RESULTS,ERROR 27 IS
2252        INDICATED.A READ SINGLE RECORD  RECORD ADDRESS ADDR03  IS ISSUED
2253        AND IF A NO RECORD FOUND RESULTS ERROR 28 IS INDICATED.THE DATA
2254        READ BACK IS CHECKED TO INSURE THE PROPER RECORD WAS READ,IF IT
2255        IS NOT THE CORRECT DATA,ERROR 29 IS INDICATED.ALL STATUS ERRORS
2256        WILL BE INDICATED.
2257
2258        FORMAT REQUIRED IS THE SAME AS DESCRIBED IN ROUTINE N10
2259
2260        RECORD ADDRESS & DATA FIELD USED IN WRITE SINGLE RECORD,THE REC-
2261        ORD ADDRESS WAS WRITTEN IN ROUTINE 13
2262        --ADDR01 3333333334
2263
2264        RECORD ADDRESS USED AND RECORD EXPECTED IN READ SINGLE RECORD
2265        --ADDR03 .¤  $*   -/,%  *#@   &ABCDEFGHI-JKLMNOPQR*STUVWXYZ035679
2266
2267
2268      N15       NOP                                                    1  06905  N
2269                DC      @15@           ROUTINE ID                      2  06907
2270                CS      DATAFD&299     CLEAR                           6  06908  / 11299
2271                CS                          DATA                       1  06914  /
2272                CS                              FIELS                  1  06915  /
2273                MLCA    ADDR1,FILE&7   SET RECORD ADDR                 12  06916  D 10405 10998 T
2274                MRCWG   GAP8-9,DATAFD  LOAD DATA FIELD                 12  06928  D 10532 11000 D L
2275                LU      %F1,FILE,W     WRITE SINGLE RECORD             10  06940  L %F1 10991 W
2276                BNT1    *&15           BRCH NO TRAN                     7  06950  R 06971 S B
2277                BA1     STACHK         BRCH ON ANY ERROR                7  06957  R 03333 G M
2278                B       SRCRD                                           7  C6964  J 06977
2279                    *** SET ERROR 27 ON ***
2280                SW      E27            SET ERROR IND                    6  06971  , 01828
2281          WRITE SINGLE RECORD RESULTS IN NO RECORD FOUND
2282      SRCRD     CS      DATAFD&99      CLEAR DATA FIELD                 6  06977  / 11099
2283                MLCA    ADDR3&5,FILE&7 SET RECORD ADDR                 12  06983  D 10437 10998 T
2284                MLCWS   &M@,DATAFD&60  SET WMGM                        12  06995  D 10617 11060 7
                                                                                      G
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

2285                LU     %F1,FILE,R          READ SINGLE RECORD   10  07007  L %F1 10991 R
2286                BNT1   *&15                BRCH NO TRANS         7  07017  R 07038 S
2287                BA1    STACHK              BRCH ON ANY ERRORS    7  07024  R 03333 B
2288                B      SRCCHK                                    7  07031  J 07044 G
2289                    *** SET ERROR 28 ON ***                                 H
2290                SW     E28                 SET ERROR IND         6  07038  , 01829
2291      READ SINGLE RECORD RESULTS IN NO RECORD FOUND
2292      SRCCHK    SW     DATAFD                                    6  07044  , 11000
2293                C      ACCR3&65,DATAFD&59  CHECK DATA READ      11  07050  C 10497 11059
2294                BE     N15XIT-12           IF IT IS GOOD BRCH    7  07061  J 07074 S
2295                    *** SET ERROR 29 ON ***
2296                SW     E29                                       6  07068  , 01830
2297      RECORD READ WAS NOT RECORD EXPECTED
2298                MLCA   CETKHD,FILE&7       RESTORE FILE ADDR    12  07074  D 10558 10998 T
2299      N15XIT    B      MONITR                                    7  07086  J 02101
2300
```

```
PGLIN    LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2302                  *** TEST ROUTINE DESCRIPTION ***
2303                *** TEST CYLINDER OPERATION ***
2304          WITH A DATA FIELD OF 9 RECORDS  240 CHARS  3 TRACKS ARE WRITTEN
2305        USING THE CYLINDER OPTION.THIS IS DONE ON EVERY 3 TRACKS UNTIL
2306        THE ENTIRE CYLINDER IS COMPLETED,CYL 250. THE ADDRESS IS RESET
2307        AND A READ CYLINDER OP OF 3 TRACKS IS PERFORMED.THE READ DATA IS
2308        COMPARED TO THE ORIGINAL WRITE DATA AND IF THEY DO NOT COMPARE
2309        ERROR 30 IS INDICATED.THE READ IS REPEATED FOR EVERY 3 TRACKS
2310        ALSO.THIS TEST IS RUN ONLY IF CYO IS AVAILABLE.
2311
2312        FORMAT REQUIRED IS THE SAME AS DESCRIBED IN ROUTINE N10
2313
2314        DATA FIELD ORGANIZATION
2315        RECORD 10CHARS--RECORDS 10CHARS--RECORD 60CHARS REPEAT 2 TIMES
2316
2317        DATA FIELD USED TO WRITE 3 TRACKS
2318        YYY-3 RECORDS OF 80 Y EACH-YYYY
2319
2320   N16  NOP                                                    1  07093  N
2321        DC    &16&              ROUTINE ID                     2  07095
2322        BCE   *&8,SPTAD0,1      BRCH IF IN MANUAL MD          12  07096  B 07115 01004 1
2323        B     N16XIT                                           7  07100  J 07396
2324        B     TYP2              GO TYPE MESSAGE                7  07115  J 01607
2325        DCW   &CYO AVAIL&,G                                    9  07130
2326        DC    & &,G             ANSWER                         1  07132
2327        BCE   *&8,*-13,1        BRCH IF CYO IS AVAIL          12  07134  B 07153 07132 1
2328        B     N16XIT                                           7  07146  J 07396
2329        CS    DATAFD&299        CLEAR                          6  07153  / 11299
2330        CS                            DATA                     1  07159  /
2331        CS                                FIELD                1  07160  /
2332        MLCA  GETKHD,FILE&7     SET HA1 & HA2                 12  07161  D 10558 10998 T
2333        MLCS  &Y&,DATAFD        LOAD                          12  07173  D 10694 11000 3
2334        SW    DATAFD&239,FILE&4       THE                     11  07185  , 11239 10995
2335        MRC   DATAFD,DATAFD&1                 DATA            12  07196  D 11000 11001 #
2336        CW    DATAFD&239                                        6  07208  ¤ 11239
2337        MLCWS &M&,DATAFD&240                                   12  07214  D 10617 11240 7
2338   CYCWRT   LU    %F&,FILE,W        WRITE CYO                 10  07226  L %F@ 10991 W
```

```
PGLIN     LABEL     OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION.
2339                BAL    STACHK           BRCH ON ANY ERROR  7  07236  R 03333 GM
2340                A      @3@,FILE&5       UPDATE TRK ADDR BY 3  11  07243  A 10625 10996
2341                C      FILE&5,@59@      IS THIS HEAD 39  11  07254  C 10996 10696
2342                BE     *&8              IF SO BRCH  7  07265  J 07279 S
2343                B      CYCWRT           7  07272  J 07226
2344                MLCA   @9@20@,FILE&5    RESET ADDRESS  12  07279  D 10674 10996 T
2345      CYCRD     CS     DATAFD&239       CLEAR  6  07291  / 11239
2346                CS                            DATA  1  07297  /
2347                CS                                  FIELD  1  07298  /
2348                LU     %F@,FILE,R       READ CYO  10  07299  L %F@ 10991 R
2349                BEX1   STACHK,MS        BRCH ON ANY EUT WLR  7  07309  R 03333 SMG
2350                BAL    *&1              7  07316  R 07323 M
2351                SW     DATAFD           6  07323  , 11000
2352                C      DATAFD&239,DATAFD&238  CHECK DATA READ  11  07329  C 11239 11238
2353                BE     *&14             IF IT IS GOOD BRCH  7  07340  J 07360 S
2354                     *** SET ERROR 30 ON ***
2355                SW     E30              6  07347  , 01831
2356        RBAD DATA DOES NOT COMPARE WITH DATA WRITTEN
2357                B      N16XIT           7  07353  J 07396
2358                A      @3@,FILE&5       UPDATE ADDR BY 3  11  07360  A 10625 10996
2359                C      FILE&5,@59@      IS THIS HEAD 39  11  07371  C 10996 10696
2360                BE     *&8              IF IT IS BRCH  7  07382  J 07396 S
2361                B      CYCRD            7  07389  J 07291
2362      N16XIT    B      MONITR           7  07396  J 02101
```

```
PGLIN    LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2364                        *** TEST ROUTINE DESCRIPTION ***
2365                      *** TEST INTERUPT FROM 7631-1301 ***
2366          THIS TEST IS RUN WHEN THE PRIORITY FEATURE IS AVAILABLE.A SEEK
2367        CYL 000 IS ISSUED,THE PROGRAM ENTERS THE ALERT MODE AND WAITS IN
2368        A LOOP FOR THE INTERUPT.AFTER CER.AIN TIME,IF NO INTERUPT OCCURES
2369        ERROR 31 IS INDICATED.STATUS ERRORS ARE ALSO INDICATED.
2370
2371     N17        NOP                                               1  07403  N
2372                DC      @17@              ROUTINE ID              2  07405
2373                BCE     *&8,1264,1        BRCH IF PRIORITY AVL   12  07406  B 07425 01264 1
2374                B       N17XIT                                    7  07418  J 07517
2375                MLCA    GETKHD,FILE&7     RESET ADDRESS          12  07425  D 10558 10998 T
2376                SC      1,FILE            MOVE THE ACCESS        10  07437  M %F0 10991 R
2377                BCB1    *-16                                      7  07447  R 07437 2
2378                BAI     STACHK            BRCH  ON ANY ERROR      7  07454  R 03333 M
2379                BEPA    *&1               ENTER ALERT MODE        7  07461  Y 07468 E
2380                S       X7                RESET IX 7              6  07468  S 00059
2381     INTLUP     A       @1@,X7            WAIT FOR DELAY         11  07474  A 10619 00059
2382                BCE     N17XIT,X7-3,4     BRCH IF DELAY COMPLETE 12  07485  B 07517 00056 4
2383                B       INTLUP                                    7  07497  J 07474
2384     NOINTR     BXPA    *&1               EXIT ALERT MODE         7  07504  Y 07511 X
2385                      *** SET ERROR 31 ON ***
2386                SW      E31               SET ERROR IND           6  07511  , 01832
2387          NO INTERUPT AT THE COMPLETION OF THE SEEK OP
2388     N17XIT     B       MONITR                                    7  07517  J 02101
```

```
PGLIN   LABEL    OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2390                    *** CHANNEL AND MODULE ADDRESS UPDATE ROUTINE ***
2391          THIS ROUTINE LOCATES CHANNELS WITH 7631 ON THEM AND CAUSES
2392          THE PROGRAM TO BE INITIALIZED ACCORDINGLY AND LOCATES READY
2393          ACCESSES ON THE CHANNEL.AS LONG AS THERE ARE UNTESTED READY ACC
2394          AVAILABLE THIS ROUTINE WILL LOOP BACK TO ROUTINE NO1 OR NO7.WHEN
2395          THERE ARE NO MORE UNTESTED ACCESSES ON ANY CHANNEL THIS ROUTINE
2396          FALLS THROUGH TO MONITOR.THE UPDATE ROUTINE STARTS WITH CHANNEL 1
2397
2398    N18   NOP                                                        1  07524  N
2399          DC       @18@          ROUTINE TO                        2  07526
2400          B        TOP&7                                           7  07527  J 07622
2401          BCE      *&8,0&X10,F   FILES ON THIS CHNL                12  07534  B 07553 00..0 F
2402          B        UPCHNL        GO UP DATE FOR NEXT               7  07546  J 07681
2403          MLCA     CODE3&X15,INCODE MOVE CHANNEL CODES             12  07553  D 10EF2 07584 T
2404          B        CHALTR        GO TO CHANNEL ALTER               7  07565  J 01045
2405          CCW      TOP           HIGH LIMIT                        5  07576  07615
2406          DC       BOTTOM        LOW LIMIT                         5  07581  04292
2407          CCW      @ @                                             1  07582
2408          DC       @ @                                             1  07583
2409    INCODE DC      @ @                                             1  07584
2410          SW       CHNLSW&1      TURN ON CHANNEL SW                6  07585  . 07853
2411    RDYFIL SC      1,FILE        SEEK THE ACCESS                  10  07591  M 2F0 10991 R
2412          BNR1     *&15          BRCH NOT READY                    7  07601  R 07622 1
2413          BA1      *&1                                             7  07608  R 07615 M
2414    TOP   B        GOTIT         BRCH,FOUND A RDY MOD              7  07615  J 07722
2415          A        @1@,FILE      UPDATE ACCESS                    11  07622  A 10619 10991
2416          BCE      RDYFIL,FILE,1 BRCH IF NO ACCESS OVERFLOW       12  07633  B 07591 10991 1
2417          S        @2@,FILE      RESET ACCESS ADDRESS             11  07645  S 10632 10991
2418          A        @1@,FILE&1    UPDATE MOD ADDR                  11  07656  A 10619 10992
2419          BZ       *&8           BRCH IF TEN MOD TRIO              7  07667  J 07681 V
2420          B        RDYFIL        GO TRY ANOTHER MOD                7  07674  J 07591
2421    UPCHNL A       @57@,X10      UPDATE                           11  07681  A 10698 00074
2422          A        @3@,X15             IND REG 10&15              11  07692  A 10625 00099
2423          BCE      N18XIT,X15-1,1 BRCH IF ALL CHNLS CHECKED       12  07703  B 07902 00098 1
2424          B        N18&10        GO CHK NEXT CHNL                  7  07715  J 07534
2425    GOTIT MLNS     FILE&1,RDYMSG&14 MOVE MOD ADDR                 12  07722  D 10992 07791 1
2426          MLCB     FILE&1,AVATAB&X15 SAVE ACCESS & MOD ADR        12  07734  D 10992 10E18 L
```

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
2427		MLNS	FILE,RDYMSG&8	MOVE ACCESS ADDR	12	07746	D 10991 07785 1
2428		MLNS	INCODE,RDYMSG&9	MOVE CHANNEL NUMBER	12	07758	D 07584 07796 1
2429		B	TYP1		7	07770	J 01593
2430	RDYMSG	DCW	@TST ACC MOD CH @,G		20	07777	
2431		B	TYP1		7	07798	J 01593
2432		DCW	@TURN ON FORMAT,CE-WRT,&HAO FOR THIS ACC & MOD@,G		45	07849	
2433		H		WAIT FOR ACTION	1	07851	.
2434	CHNLSW	NOPWM			1	07852	N
2435		B	NUCHNL	CHANNEL SWITCH	7	07853	J 07878
2436		ZA	&NC7,X3	LOAD IX 3	11	07860	M 10703 00039
2437		B	O&X3		7	07871	J 000MO
2438	NUCHNL	CW	CHNLSW&1	TURN OFF CHANNEL SW	6	07878	M 07853
2439		ZA	&NC1,X3	LOAD IX 3	11	07884	M 10708 00039
2440		B	O&X3		7	07895	J 000MO
2441	N18XIT	B	MONITR	GO TO MONITOR	7	07902	J 02101

```
PGLIN   LABEL    OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2443
2444                    *** TEST ROUTINE DESCRIPTION ***
2445                  *** TEST FILES & TAPES OVERLAPPED ***
2446          THIS ROUTINE USES FILES ON EVERY CHANNEL WHICH HAS THEM,ON
2447        CHANNELS WHICH DO NOT HAVE FILES,TAPES ARE USED.IF NEITHER FILES
2448        OR TAPES ARE AVAILABLE THE CHANNEL IS BY-PASSED.STARTING WITH
2449        CHANNEL 1 AN OVERLAPPED WRITE OP IS GIVEN TO FILES OR TAPE.THEN
2450        CHANNEL 2 IS STARTED AND THEN 3 AND 4.CHANNEL 1 IS CHECKED AGAIN
2451        IF IT IS IN OVERLAP CHANNEL 2 IS CHECKED AND SO ON,WHEN A CHANNEL
2452        IS FOUND TO BE OUT OF OVERLAP ANOTHER WRITE IS INITIATED ON THE
2453        CHANNEL.AFTER 500 WRITES HAVE BEEN ISSUED THE FILES ARE ISSUED
2454        READ OPS,WHEN 500 READS HAVE BEEN INIATED THE OVERLAP OP-
2455        ERATIONS ARE STOPPED.THE DATA READ IS CHECKED IN MEMORY AND ERROR
2456        36 IS GIVEN IF IT IS INVALID.THE PROG DELAYS 1.5 SECONDS AND THEN
2457        EVERY CHANNEL THAT WAS USED IS CHECKED FOR OVERLAP IN PROCESS. IF
2458        ANY ARE FOUND TO BE IN PROCESS AN ERROR IS INDICATED,FOR CH1
2459        ERROR 32,FOR CH2 ERROR 33,FOR CH3 ERROR 34,FOR CH4 ERROR 35.ALL
2460        STATUS ERRORS WILL BE INDICATED ALSO.
2461        FORMAT REQUIRED IS THE SAME AS DESCRIBED IN ROUTINE N1C
2462        DATA FIELD USED FOR FILES ON CYL 253 ADDRESS 9#20
2463
2464        DATA FIELD USED FOR TAPES  TAPE UNIT 1
2465   N19          NOP                                                  1  07909  N
2466                DC      #19#                 ROUTINE ID              2  07911
2467                BCE     *-8,1263,1           BRCH IF OVERLAP AVAIL  12  07912  B 07931 01263 1
2468                B       N19XIT                                       7  07924  J 09281
2469                BCE     *-8,SPTAC0,1         MANNUAL OPERATION      12  07931  B 07950 01004 1
2470                B       N19XIT                                       7  07943  J 09281
2471   RESET        NOPWM                                                1  07950  N
2472                B       NOWGO                                        7  07951  J 08389
2473                SW      RESET&1                                      6  07958  , 07951
2474                MLCA    #9#20#,FILE&5        RESET FILE ADDR        12  07964  D 10674 10996 T
2475                MLCA    AVATAB,FILE&1        LOAD ACCESS & MOD ADR FOR CHL 1  12  07976  D 10598 10992 T
2476                MU      %FC,FILE,R           POSITION CHL 1 ACCESS  10  07988  M %F0 10991 R
2477                BCB1    *-16                                         7  07998  R 07988 2
2478                BA1     *-1                                          7  08005  R 08012 MG
2479                SC      1,FILE               WAIT FOR BUSY TO DROP  10  08012  M %F0 10991 R
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PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
2480                BCBI   *-16                                              7  08022  R 08012 2G
2481                BAI    *&1                                               7  08029  R 08036 M
2482                MLCA   AVATAB&3,FILE&1     LOAD ACC&MOD ADDR FOR CHL 2  12  08036  D 10601 10992 T
2483                MU     ¤FO,FILE,'          POSITION CHL 2 ACCESS        10  08048  M ¤FO 10991 R
2484                BCBI   *-16                                              7  08058  R 08048 2G
2485                BAI    *&1                                               7  08065  R 08072 M
2486                MU     ¤FC,FILE,R          WAIT FOR BUSY TO DROP        10  08072  M ¤FO 10991 R
2487                BCBI   *-16                                              7  08082  R 08072 2G
2488                BAI    *&1                                               7  08089  R 08096 M
2489                BCE    POSCH4,127C,        BRCH IF NO CHL 3             12  08096  B 08217 01270
2490                MLCA   AVATAB&6,FILE&1     LOAD ACC&MOD ADDR FOR CHL 3  12  08108  D 10604 10992 T
2491                MU     &FC,FILE,R          POSITION CHL 3 ACCESS        10  08120  M ¤FO 10991 RQ
2492                BCBI   *-16                                              7  08130  R 08120 2G
2493                BAI    *&1                                               7  08137  R 08144 M
2494                DC     @READ,INSURE MOD 0 ACC 0 IS SET TO THE CE CYL FOR @  49  08192
2495                MU     &FC,FILE,R          WAIT FOR BUSY TO DROP        10  08193  M ¤FO 10991 RQ
2496                BCBI   *-16                                              7  08203  R 08193 2G
2497                BAI    *&1                                               7  08210  R 08217 M
2498  POSCH4        BCE    INSTCE,127C,        BRCH IF NO CHL 4             12  08217  B 08289 01270
2499                MLCA   AVATAB&9,FILE&1     LOAD ACC&MOD ADDR FOR CHL4   12  08229  D 10607 10992 T
2500                MU     -FC,FILE,R          POSITION CHL 4 ACCESS        10  08241  M ¤FO 10991 R
2501                BCBI   *-16                                              7  08251  R 08241 2G
2502                BAI    *&1                                               7  08258  R 08265 M
2503                MU     -FC,FILE,R          WAIT FOR BUSY TO DROP        10  08265  M ¤FO 10991 R
2504                BCBI   *-16                                              7  08275  R 08265 2G
2505                BAI    *&1                                               7  08282  R 08289 M
2506  INSTCE        B      TYP1                                              7  08289  J 01593
2507                DCW    @PRESS COMPUTER RESET,SET ALL FORMAT SWITCHES TO @  48  08343
2508                DC     @READ,THEN PRESS START TO BEGIN OVERLAP TEST@,G   43  08386
2509                H                                                         1  08388  .
2510  NOWGO         CW     RESET&1                                           6  08389  ¤ 07951
2511                CW     RDRWF&1,ERRONF&1    CLEAR RD OR WRT SW           11  08395  ¤ 08637 08664
2512                CW     ERRONT&1,CKCHL1&1   CLEAR ERROR SW               11  08406  ¤ 08929 08695
2513                CW     CKCH11&1,CKCH12&1                                11  08417  ¤ 08870 08960
2514                MLNA   @00@,FILE&1         SET ACC & MOD ADDR           12  08428  D 10653 10992 /
2515                MLCA   CETKHD,FILE&7       RESET FILE ADDR              12  08440  D 10558 10998 T
2516  RESETX        ZA     @01331@,X1C         LOAD IX 10                   11  08452  M 10713 00074 GQ
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PGLIN     LABEL     OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
2517                ZA     @12918,X11       LOAD IX 11      11  08463  QM 10717 00079
2518                ZA     @000008,X12      LOAD IX 12      11  08474  QM 10651 00084
2519      FILE1     BCE    MOVCOD,0&X10,F   FILES AVAIL      12  08485  B 08561 00..0 F
2520      TAPE1     BCE    MOVCOD,0&X11,1   TAPES AVAIL      12  08497  B 08561 00.QM0 1
2521      UPINDX    A      @57@,X10         UPDATE IX 10    11  08509  A 10698 00074
2522                A      @57@,X11         UPDATE IX 11    11  08520  A 10698 00079
2523                A      @3@,X12          UPDATE IX 12    11  08531  A 10625 00084
2524                BCE    RESETX,X10,QM    BRCH IF ALL CHLS CHKD  12  08542  B 08452 00074 QM
2525                B      FILE1            GO FIND FILE OR TAPE    7  08554  J 08485
2526      MOVCOD    BCE    TAPE1,AVATAB&X12, BRCH IF NO FILE READY ON THIS CHL  12  08561  B 08497 10E98
2527                MLCA   AVATAB&X12,FILE&1 MOVE ACC&MOD ADDR FOR THIS CHL  12  08573  D 10E98 10992 T
2528                MLCA   OCCDE3&X12,INITL1 LOAD CHANNEL CODES FOR OVLP  12  08585  D 10E74 08616 T
2529                B      CHALTR           GO TO CHANNEL ALTER      7  08597  J 01045
2530                CCW    FRCM                                      5  08608  08998
2531                DC     TO                                        5  08613  08644
2532                DCW    @@@                                       1  08614
2533                DC     @R@                                       1  08615
2534      INITL1    DC     @1@                                       1  08616
2535                BCE    *&8,0&X10,F      FILE OR TAPE AVAIL      12  08617  B 08636 00..0 F
2536                B      TAPECP                                    7  08629  J 08897
2537      RORWF     NOPWM                                            1  08636  N
2538                B      RDFILE           READ - WRITE SW         7  08637  J 08722
2539      TO        MRCHG  HACP,DATAFC      LOAD THE DATA FIELD    12  08644  D 10398 11000 DL
2540                BCL1   UPINDX           BRCH ON OVERLAP         7  08656  J 08509 1
2541      ERRONF    NOPWM                                            1  08663  N
2542                BA1    FILERW           BRCH ON ANY IND         7  08664  R 08688 GM
2543                LU     @F5,FILE,W       WRITE HAD OVERLAP      10  08671  L @F5 10991 W
2544                B      WRTCNT           GO TO WRITE COUNT       7  08681  J 09012
2545      FILERW    SW     CKCHL1&1                                 6  08688  . 08695
2546      CKCHL1    NOPWM                                            1  08694  N
2547                BA1    *&1              CLEAR I/O INTRLK ON     7  08695  R 08702 GM
2548                CW     CKCHL1&1             CHANNEL 1           6  08702  ¤ 08695
2549                BA1    STACHK           GO TO STATUS CHECK      7  08708  R 03333 GM
2550                B      FILERW-17                                7  08715  J 08671
2551      RDFILE    BCL1   UPINDX           BRCH OVERLAP IN PROCCESS  7  08722  J 08509 1
2552                BA1    FILERR           BRCH ON ANY ERROR       7  08729  R 08863 GM
2553                C      CATAFD&99,ADDR3&65 CHECK DATA READ      11  08736  C 11099 10497
2554                B      *-9                                          087    J   51 S
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PGLIN     LABEL     OPCOD   OPERAND                        CT  ADDRS  INSTRUCTION
2555                B       OVLERR          REPORT ERROR    7  08754  J 08815
2556                C       DATAFD&33,ADDR2&15 CHECK DATA READ 11 08761 C 11033 10431
2557                BE      *&8                             7  08772  J 08786 S
2558                B       OVLERR                          7  08779  J 08815
2559                C       DATAFD&17,ADDR1&15 CHECK DATA READ 11 08786 C 11017 10420
2560                C       DATAFD&17,ADDR1&10 CHECK DATA READ 11 08797 C 11017 10415
2561                BE      *&14                            7  08808  J 08828 S
2562      OVLERR    SW      E36             TURN ON ERROR IND 6  08815  , 01837
2563                B       FILERR                          7  08821  J 08863
2564                CS      DATAFD&99                       6  08828  / 11099
2565                MLCWS   @MG,DATAFD&1CO  SET TERMINATING WMGM 12 08834 D 10617 11100 7
2566                LU      @F5,FILE,R      READ HAD OVERLAP 10 08846  L @F5 10991 R
2567                B       RDCNT           GO TO READ COUNT 7  08856  J 08987
2568      FILERR    SW      CKCH11&1                        6  08863  , 08870
2569      CKCH11    NOPWM                                   1  08869  N
2570                BAI     *&1             CLEAR I/O INTRLK ON 7 08870 R 08877 GM
2571                CW      CKCH11&1            CHANNEL 1   6  08877  ¤ 08870
2572                BAI     STACHK          GO TO STATUS CHECK 7 08883 R 03333 GM
2573                B       FILERR-17                       7  08890  J 08846
2574      TAPBGP    MLCWS   @MG,CATAFD&244  SET FIELD LENGTH 12 08897  D 10617 11244 7
2575                BCL1    UPINDX          BRCH OVL-IN-PROCESS 7 08909 J 08509 1
2576                MRCWG   ADDR1,DATAFD&101 LOAD DATA FIELD 12 08916  D 10405 11101 DL
2577      ERRCNT    NOPWM                                   1  08928  N
2578                BAI     TAPERW          BRCH ON ANY ERROR 7 08929  R 08953 GM
2579                LU      @B1,DATAFD&101,W WRITE TAPE OVERLAP 10 08936 L @B1 11101 W
2580                B       WRTCNT          GO TO WRITE COUNTER 7 08946 J 09012
2581      TAPERW    SW      CKCH12&1                        6  08953  , 08960
2582      CKCH12    NOPWM                                   1  08959  N
2583                BAI     *&1             CLEAR I/O INTRLK ON 7 08960 R 08967 GM
2584                CW      CKCH12&1            CHANNEL     6  08967  ¤ 08960
2585                BAI     STACHK          GO TO STATUS CHECK 7 08973 R 03333 GM
2586                B       TAPERW-17                       7  08980  J 08936
2587      RDCNT     A       @1&,OVLCNT      UPDATE PASS COUNT 11 08987 A 10619 10545
2588      FRCM      BZ      CHKOVL          BRCH IF 100 PASSES 7 08998 J 09066 V
2589                B       UPINDX          GO TRY ANOTHER CHL 7 09005 J 08509
2590      WRTCNT    A       @1&,OVLCNT      UPDATE PASS COUNT 11 09012 A 10619 10545
2591                SW      ERRCNF&1,ERRONT&1 SET ERROR SWS 11 09023 , 08664 08929
2592                BCE     SETRDF,OVLCNT-2,5 BRCH ON 500TH PASS 12 09034 B 09053 10543 5
```

```
PGLIN   LABEL    OPCOD  OPERAND                        CT  ADDRS  INSTRUCTION
2593             B      UPINDX          GO TRY ANOTHER CHL   7  09046  J 08509
2594     SETRDF  SW     RDRWF&1         TURN ON RD-WRT SW    6  09053  , 08637
2595             B      UPINDX          GO TRY ANOTHER CHL   7  09059  J 08509
2596     CHKOVL  S      DELAY           RESET DELAY          6  09066  S 10550
2597     WAIT    A      @1@,DELAY       DELAY FOR 1.5 SECS  11  09072  A 10619 10550
2598             BZ     *&8               TO ALLOW ALL OVL   7  09083  J 09097 V
2599             B      WAIT              OPERATIONS TO END  7  09090  J 09072
2600             BCE    *&8,1268,1      CH 1 AVAIL           12  09097  B 09116 01268 1
2601             B      CKOVL2          GO CHECK CHL2 OVL    7  09109  J 09143
2602             BCL1   *&8             BRCH CH1 OVL IN PROC 7  09116  J 09130 1
2603             B      *&7                                  7  09123  J 09136
2604                 *** SET ERROR 32 ON ***
2605             SW     E32             SET ERROR IND        6  09130  , 01833
2606       CHANNEL 1 HUNG IN OVERLAP IN PROCESS
2607             BA1    *&1             CLEAR I/O INTRLK 1   7  09136  R 09143 GM
2608     CKOVL2  BCE    *&8,1269,1      CH 2 AVAIL           12  09143  B 09162 01269 1
2609             B      CKOVL3          GO CHECK CHL3 OVL    7  09155  J 09189
2610             BCL2   *&8             BRCH CH2 OVL IN PROC 7  09162  J 09176 2
2611             B      *&7                                  7  09169  J 09182
2612                 *** SET ERROR 33 ON ***
2613             SW     E33             SET ERROR IND        6  09176  , 01834
2614       CHANNEL 2 HUNG IN OVERLAP IN PROCESS
2615             BA2    *&1             CLEAR I/O INTRLK 2   7  09182  X 09189 GM
2616     CKOVL3  BCE    *&8,1270,1      CH 3 AVAIL           12  09189  B 09208 01270 1
2617             B      CKOVL4          GO CHECK CHL4 OVL    7  09201  J 09235
2618             DCW    @J@                                  1  09208
2619             DC     CKOVL4-6                             5  09213  09229
2620             DC     @3@                                  1  09214
2621             B      *&7                                  7  09215  J 09228
2622                 *** SET ERROR 34 ON ***
2623             SW     E34                                  6  09222  , 01835
2624       CHANNEL 3 HUNG IN OVERLAP IN PROCESS
2625             DCW    @3@                                  1  09228
2626             DC     CKOVL4          CLEAR I/O INTRLK 3   5  09233  09235
2627             DC     @MG@                                 1  09234
2628     CKOVL4  BCE    *&8,1271,1      CH 4 AVAIL           12  09235  B 09254 01271 1
2629             B      N19XIT                               7  09247  J 09281
263              D      ?                                    *  0925
```

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
2631		DC	N19XIT-6		5	09259	09279
2632		DC	@48		1	09260	
2633		B	N19XIT		7	09261	J 09281
2634			*** SET ERROR 35 ON ***				
2635		SW	E35	SET ERROR IND	6	09268	, 01636
2636	CHANNEL 4 HANG IN OVERLAP IN PROCESS						
2637		DCW	@18		1	09274	
2638		DC	N19XIT	CLEAR I/O INTRLK 4	5	09279	09281
2639		DC	C@4@		1	09280	
2640	N19XIT	B	MONITR		7	09281	J 02101
2641							

PGLIN	LABEL	OPCOD	OPERAN		CT	ADDRS	INSTRUCTION
2643		***	END TEST ROUTINE ***				
2644	ENDTST	BX	SUPIT,NOERSW&I		12	09280	V 03871 02879 1
2645		B	TYP1		7	09300	J 01593
2646		DCW	&PASS0,G		4	09310	
2647	CHAREP	BCE	02000,TAC3,1	BRCH IF REPEATING	12	09312	B 02000 01003 1
2648		B	TYP1		7	09324	J 01593
2649		DCW	&INSURE ALL FORMAT & CE-WRT SNS ARE OFF0,G		38	09360	
2650		H		WAIR FOR ACTION	1	09370	.
2651		B	40C	GO TO LOADER	7	09371	J 00400
2652							

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
2654			*** PREPARE ONE INSTRUCTION LOOP AND DATA FIELD ***				
2655			*** ACCORDING TO CE REQUEST ***				
2656			WHEN THE CE SELECTS THE PROGRAM OPTION FOR ONE INSTRUCTION LOOP				
2657			ING,THIS ROUTINE TAKES THE DATA ENTERED BY THE CE AND BUILDS THE				
2658			DATA FIELD AND LOOP INSTRUCTION FROM IT.WHEN IT HAS COMPLETED				
2659			THIS IT POSITIONS THE ACCESS TO THE ADDRESS ENTERED AND BRANCHES				
2660			TO THE LOOP ROUTINE.				
2661							
2662	PREP	MLCA	226,RECADD	STORE LOOP DATA	12	09378	D 00226 10298 T
2663		CS	299	CLEAR CNTL FLD	6	09390	/ 00299
2664		ZA	ADDR4,X1C	LOAD IX 10	11	09396	N 10613 00074
2665		SW	DATAFD	CLEAR	6	09407	, 11000
2666	CLEAN7	CS	08X10	THE	6	09413	/ 00:.0
2667		SBR	X1C	DATA	7	09419	G 00074 8
2668		BW	CLEAN7,DATAFD	FIELD	12	09426	V 09413 11000 1
2669		MLCB	XCTL1-1,LOOP&1	SET MODE & CHANNEL	12	09438	D 10275 01014 L
2670		MLCS	XCTL1,LOOP&3	SET SPECIFIC OPER	12	09450	D 10276 01016 3
2671		MLCS	XCTL1&1,LOOP&9	SET MODIFIER	12	09462	D 10277 01022 3
2672		ZA	NOFCHR,X8	LOAD IND REG 8	11	09474	M 10291 00064
2673		ZA	NOFREC,WORK1	ADD NO. OF RECORDS	11	09485	M 10287 10301
2674		A	@6&,NOFCHR	INCREASE CHAR COUNT	11	09496	A 10718 10291
2675		M	NOFCHR,WORK2	RECORDS X CHARS	11	09507	@ 10291 10306
2676		ZA	WORK2,X9	LOAD RESULT INTO IX9	11	09518	M 10306 00069
2677		MLCS	NOFCHR&1,DATAFD		12	09529	D 10292 11000 3
2678		MLCS	BOSIO,LOOP&1C	ALTER B-O-S-I-O OP	12	09541	D 10278 01023 3
2679		MLCA	WA2,FILE&7		12	09553	D 10284 10998 T
2680		S	WORK2	RESET WORK 2	6	09565	S 10306
2681		BCE	LOOP,LOOP&3,0	BRCH IF SEEK OP	12	09571	B 01013 01016 0
2682		MLCS	LOOP&1,POSIT&1		12	09583	D 01014 09620 3
2683		MLCS	LOOP&1C,POSIT&1D		12	09595	D 01023 09629 3
2684		MLCS	LOOP&1C,POSIT&17		12	09607	D 01023 09636 3
2685	POSIT	SD	1,FILE	POSITION ACCESS	10	09619	M &F0 10991 R
2686		BCB1	*-16		7	09629	R 09619 2
2687		BAI	*61		7	09636	R 09643 N
2688		MLCS	LOOP&3,*&12	MOVE THE OP CODE	12	09643	D 01016 09666 3
2689		BCE	SRC,SPECCD,	IS THE OP CODE 1	12	09655	B 09697 10311
2690		BCE	TRC	IS THE OP CODE 2	6	09667	B 09746

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PGLIN  LABEL   OPCOD  OPERAND                    COMMENTS                  CT  ADDRS  INSTRUCTION
2691           BCE    NMO                        IS THE OP CODE 5          6  09673  B 09833
2692           BCE    TMA                        IS THE OP CODE 6          6  09679  B 09956
2693           BCE    MFO                        IS THE OP CODE 7          6  09685  B 10056
2694           H      PROCTL                     SPECIFIC OP INCORECT      6  09691  . 02265
2695  SRO      MLCA   RECADD,FILEC7              LOAD REC ADDR            12  09697  D 10298 10998 7
2696           SW     DATAFD&X8                  LCAB                      6  09709  . 11.00
2697           MRCW   DATAFD,DATAFD&1                 DATA                12  09715  D 11000 11001 T
2698           MLCWS  &MG,DATAFD&X8                       FIELD           12  09727  D 10617 11.08 7
2699           B      LOOP                                                7  09739  J 01013
2700  TRT      ZA     NOFREC,WORK1               ADD NO. OF RECORDS       11  09746  AQM 10287 10301
2701           S      &6&,NOFCHR                 RESET NOFCHR COUNT       11  09757  S 10718 10291
2702           S      WORK2                                               6  09768  S 10306
2703           M      NOFCHR,WORK2               RECORDS X CHARS          11  09774  &QM 10291 10306
2704           ZA     WORK2,X9                   LOAD RESULT INTO IX9     11  09785  AQM 10306 00069
2705           SW     DATAFD&X9                      THE                   6  09796  . 11.*0
2706           MRCW   DATAFD,DATAFD&1                 DATA                12  09802  D 11000 11001 T
2707           MLCWS  &MG,DATAFD&X9                       FIELD           12  09814  D 10617 11.*0 7
2708           B      LOOP                                                7  09826  J 01013
2709  HAC      A      &2&,X9                                              11  09833  A 10632 00069
2710           ZA     &0C000&,X8                 RESET IND REG 8          11  09844  AQM 10651 00064
2711           SW     DATAFD&X9                  LOAD                      6  09855  . 11.*0
2712           MRCW   DATAFD,DATAFD&1                 DATA                12  09861  D 11000 11001 T
2713           MLCWS  &MG,DATAFD&X9                       FIELD           12  09873  D 10617 11.*0 7
2714           MRC    HA2-1,CATAFD               LOAD HA2 ADDR            12  09885  D 10283 11000 0
2715  LOADDR   MLCA   RECADD,DATAFD&7&X8         LOAD                     12  09897  D 10298 11.07 T
2716           S      &1&,NOFREC                     THE                  11  09909  S 10619 10287
2717           BZ     LOOP                               RECORD           7  09920  J 01013 V
2718           A      NOFCHR,X8                              ADDR         11  09927  A 10291 00064
2719           A      &1&,RECADD                               IN         11  09938  A 10619 10298
2720           B      LOADDR                         THE DATA FLD         7  09949  J 09897
2721  TMA      SW     DATAFD&X9                  LOAD                      6  09956  . 11.*0
2722           MRCW   DATAFD,DATAFD&1                 DATA                12  09962  D 11000 11001 T
2723           MLCWS  &MG,DATAFD&X9                       FIELD           12  09974  D 10617 11.*0 7
2724           ZA     &0C000&,X8                 LOAD                     11  09986  AQM 10651 00064
2725  LOCADD   MLCA   RECADD,DATAFD&5&X8             THE                  12  09997  D 10298 11.05 T
2726           S      &1&,NOFREC                         RECORD           11  10009  S 10619 10287
2727           BZ     LOOP                                   ADDRESS      7  10020  J 01013 V
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PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
2728                A      NOFCHR,X8              INTO                      11  10027  A 10291 00064
2729                A      @1@,RECADD               THE                     11  10038  A 10619 10298
2730                B      LOCADD                     DATA FIELD             7  10049  J 09997
2731      WFC       SW     DATAFD&700C          LOAD DATA                     6  10056  , 18000
2732                MRC    DATAFD,DATAFD&1            FIELD                 12  10062  D 11000 11001 #
2733                MLCA   HAAREA,DATAFD&32     LOAD HA1 AREA OF FORMAT      12  10074  D 10353 11032 T
2734                S      @6@,NOFCHR           RESET NO. OF CHAR            11  10086  S 10718 10291
2735                ZA     NOFREC,WORK1         DETERMINE THE END            11  10097  M 10287 10301
2736                A      @1@,NOFCHR&1               ADDRESS AREAS          11  10108  A 10619 10292
2737                SW     DATAFD&42                                           6  10119  , 11042
2738                MLCS   NOFCHR&1,DATAFD&56 LOAD THE LONG GAPS               12  10125  D 10292 11056 3
2739                MLCB   DATAFD&56,DATAFD&55   OF THE FORMAT FIELD           12  10137  D 11056 11055 L
2740                MLCS   DATAFD&56,DATAFD&04  LOAD THW SHORT GAPS            12  10149  D 11056 11084 3
2741                MLCS   DATAFD&56,DATAFD&70        OF THE FORMAT FIELD      12  10161  D 11056 11070 3
2742                A      @5C@,NOFCHR          DETERMINE SIZE OF RECS IN FORMAT 11 10173  A 10720 10291
2743                ZA     NOFCHR,X9                THE FORMAT                11  10184  M 10291 00069
2744      LOOFOR    MLCA   DATAFD&84,DATAFD&84&X9         LOAD RECS IN FORMAT 12  10195  D 11084 11.Y4 T
2745                S      @1@,NOFREC           REDUCE REC COUNT BY1         11  10207  S 10619 10287
2746                BZ     *&19                                                7  10218  J 10243 V
2747                A      NOFCHR,X9                                           11  10225  A 10291 00069
2748                B      LOOFOR                                              7  10236  J 10195
2749                MLCS   NOFCHR&1,DATAFD&42&X9  LOAD LAST GAP               12  10243  D 10292 11.U2 3
2750                MLCWS  @G@,DATAFD&43&X9     SET TERMINATING WMGM         12  10255  D 10617 11.U3 7
2751                B      LOOP                                                7  10267  J 01013
2752
```

```
PGLIN     LABEL     OPCOD  OPERAND                                                                  CT  ADDRS  INSTRUCTION

2754                ***  CONSTANTS  ***
2755      LRDATA    DCW    @ @                                                                       1  10274
2756                DCW    @ @                                                                       1  10275
2757      XCTL1     DCW    @ @                                                                       1  10276
2758                DC     @ @                                                                       1  10277
2759      BOSIO     DCW    @ @                                                                       1  10278
2760      TKHD      DCW    @    @                                                                    4  10282
2761      HA2       DC     @  @                                                                      2  10284
2762      NOFREC    DCW    @   @                                                                     3  10287
2763      NOFCHR    DCW    @    @                                                                    4  10291
2764                DC     @ @                                                                       1  10292
2765      RECADD    DCW    @      @                                                                  6  10298
2766      WORK1     DCW    @0C0@                                                                     3  10301
2767      WORK2     DC     @0C0C0@                                                                   5  10306
2768      SPECOD    DCW    @76521@                                                                   5  10311
2769      ADR1      DCW    DATAFD6245                                                                5  10316  11245
2770      TOTIME    DCW    @0C00@                                                                    4  10320
2771      HAAREA    DCW    @4444443333333333334333333333333334@                                    33  10353
2772      GAP6      DCW    @22222222222222211111111111111211111111111112@,G                        43  10396
2773       HAOP     DC     @8E@                                                                      2  10398
2774      ADDR1     DCW    @ADDR01@                                                                  6  10405
2775                DC     @***---E&E @                                                             10  10415
2776       ADDR2    DCW    @ADDR0212488421  @                                                      16  10416
2777       ADDR3    DCW    @ADDR03.¤TM$*B.L-/,%SMB#@.TMMABCDEFGHI.JKLMNOPQR*ST@                    50  10432
                                LG  R.D   WSS  .GTQ
2778                DC     @UVWXYZ035679    @,G                                                     16  10497
2779      GAP8      DCW    @4444444444444444333333333333343333333333333334@,G                      43  10541
2780      CYLCNT    DCW    @0C0@                                                                     3  10545
2781      DELAY     DCW    @0C0C0@                                                                   5  10550
2782      COUNT     DCW    @0C@                                                                      2  10552
2783      CETKHD    DCW    @9#2088@,G                                                                6  10558
2784      CODE3     DCW    @%R1@                                                                     3  10562
2785                DCW    @¤X2@                                                                     3  10565
                           Q
2786                DCW    @M33@                                                                     3  10568
2787                DCW    @.14@                                                                     3  10571
2788      CCODE3    DCW    @@R1@                                                                     3  10574
2789                DCW    @*X2@                                                                     3  10577
  Q                 CW     1$33                                                                      3  1  10
```

CONSTANTS

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
2791		DCW	@#14@	3	10583	
2792	BLANK	DCW	@ @,G	4	10584	
2793	INTRET	B	N17XIT	7	10589	J 07517
2794		DC	@ @	1	10596	
2795	AVATAB	DCW	@ @	2	10598	
2796		DC	@ @	1	10599	
2797		DCW	@ @	2	10601	
2798		DC	@ @	1	10602	
2799		DCW	@ @	2	10604	
2800		DC	@ @	1	10605	
2801		DCW	@ @	2	10607	
2802		DCW	@M@	1	10608	
2803	ADDR4	DCW	DATAFD&7000	5	10613	18000
2804		LTORG	*		10614	
2804			@N@	1	10614	
2804			@#@	1	10615	
2804			@L@	1	10616	
2804			@M@	1	10617	
2804			@ @	1	10618	
2804			@1@	1	10619	
2804			@00209@	5	10624	
2804			@3@	1	10625	
2804			@7@	1	10626	
2804			@0C237@	5	10631	
2804			@2@	1	10632	
2804			@09995@	5	10637	
2804			@01@	2	10639	
2804			@0CC01@	5	10644	
2804			@51@	2	10646	
2804			@0C000@	5	10651	
2804			@0C@	2	10653	
2804			@317@	3	10656	
2804			@01332@	5	10661	
2804			N18	5	10666	07524
2804			@CC00@	4	10670	
2804			@9#20@	4	10674	
2804			@4@	1	10675	

PGLIN	LABBL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
28C4			@31@	2	10677	
28C4			@9880@	4	10681	
28C4			@9930@	4	10685	
28C4			@300@	3	10688	
28C4			N11	5	10693	06409
28C4			@Y@	1	10694	
28C4			@59@	2	10696	
28C4			@57@	2	10698	
28C4			N07	5	10703	05477
28C4			N01	5	10708	04289
28C4			@01331@	5	10713	
28C4			@1291@	4	10717	
28C4			@6@	1	10718	
28C4			@5C@	2	10720	
28C5		ORG	10991		10991	
28C6	FILE	DCW	@000000880,G	8	10991	
28C7	DATAFD	DC	@ @	1	11000	
28C8		DS	300		11300	
28C9		LOAD				
2810		END	2000			J02000

END OF ASSEMBLY

6.24.00.0 7631 ELECTRONIC TEST DESCRIPTION

Beginning with a reset of the machine, the program starts with as simple an operation as possible and builds upward to more complex operations and tests. The program runs through 27 test routines in either the manual or automatic mode. Although both modes require manual intervention, the automatic requires far less than the manual mode, but the manual mode is a more thorough test. The program uses any 1302 access and module selected, all other access and modules are bypassed and are set inoperative. Any 7631 available on any channel may be tested starting with channel 1 through 4.

The program does not require that the home addresses be present or correct, and data on the customer's tracks is not disturbed.

6.24.01.1 OPERATING PROCEDURE

The standard procedures outlined in the package write-up apply to this program. In addition, the following procedures are used to run this program.

01.1 SWITCH SETTINGS PREVIOUS TO RUNNING PROGRAM

A. All 1302 modules and access are set operative (all channels being tested).

B. Check control switch to reset and restart (1410 console).

01.2 SPECIAL REQUESTS

A. "Tst Chl x, Enter 2 Digit Acc & Mod Addr to be used, Enter 99 if no test on this channel"
If the CE wants the 7631 tested on the channel indicated, he enters the access and module to be used. If the 7631 is not to be tested, he enters 99.

B. "HAO, CE WRT, CE-HAO, On for this Chl 7631. WRT FMT ON for SLTD Acc & Mod, SEL MODE"
This tells the CE to turn on the switches required and requests that the mode be selected. If the CE enters a "1" manual mode is run; if a 1 is entered, automatic mode is run.

6.24.01.0 OPERATING PROCEDURE (continued)

C. "COMP RESET, CHK 7631"

The CE presses Computer Reset, checks the lights on the 7631 to insure that it is reset, and then presses Start.

D. "ACC TO CYL 000" (Manual Mode only)

The CE manually sets the access on 1301 module 0 to cylinder 000. Press Start.

E. "ACC TO CYL 110" (Manual Mode only)

The CE manually sets the access to cylinder 110. Press Start.

F. "ACC TO CYL 194" (Manual Mode only)

The CE sets the access to cylinder 194. Press Start.

G. "ACC TO CYL 250"

The CE checks the access to insure it has positioned itself properly at cylinder 250, then presses Start.

H. "# OF SPARE HEADS"

The CE enters the number of spare heads available for writing on alternate surfaces (should enter 2, 4, or 6).

I. "CE-HAO OFF"

Ce turns off CE-HAO switch and presses Start.

J. "CYO"

CE enters 1 if CYOafeature is available.

K. "MOD 3"

CE enters 1 if 7631 is a Model III.

L. "HAO & WRT FMT SWS OFF" (manual mode only)

CE turns off HAO and write format switches on 7631 being tested.

6.24.01.1 OPERATING PROCEDURE (continued)

L. "WRITE INHIBIT AND HAO SWS ON" (Manual mode only)

CE turns on write inhibit and HAO switches on 7631 being tested.

M. "WRT INHIBIT OFF, HAO & CE-HAO SWS ON"

CE turns off write inhibit, turns on HAO and CE-HAO switches on 7631 being tested.

N. "PASS, SWS OFF"

When test is complete, this reminds the CE to turn off 7631 switches before continuing.

01.3 SPECIAL TAD'S

There is one special TAD for this program (memory location 01005). This TAD is set when the mode is selected; if it is set to 1, manual mode is run, if it is set to 1 automatic mode is run. This TAD is set to 1 when the program is loaded.

01.4 STANDARD OPTIONS

Two of the standard options are not available with this program, they are:

A. Alter Routine Sequence - Code 3

B. One Instruction Loop - Code 5

01.5 MANUAL MODE

When running in the manual mode, the following tests are run which are not run in the automatic mode.

A. Test 7631 Track Register

Routines N06, N07, and N08

B. Test HAO, Write Format, and Write Inhibit Switches

Routine N24

01.6 SUMMARY TYPEOUT

The summary of errors typeout is not available with this program.

6.24.02.0 OPERATING HINTS

02.1 SELECTING MANUAL MODE (ALTER SPECIAL TAD)

If the mode selected when the program is first loaded must be changed, use program option code 2 (alter memory) to change memory location 01005 to a 1 or $\overline{1}$.

02.2 LOOPING ROUTINES

Certain routines make requests during their operation for switch settings. These requests must be honored for valid operation.

6.24.03.0 PROGRAM STOPS

03.1 ERROR STOPS

None

03.2 NORMAL STOPS

Memory Location	Reason
03567	Wait for CE to press Computer Reset and Start.
04685	Wait for CE to position ACC at cycle 000 (manual mode only).
04829	Wait for CE to position ACC at cycle 110 (manual mode only)
04973	Wait for CE to position ACC at cycle 194 (manual mode only)
05153	Wait for CE to insure ACC is at cycle 250.
07360	Wait for CE to turn off CE-HAO (manual mode)
08867	Turn off write format and HAO switches (manual mode)
09070	Turn on write inhibit and HAO switches (manual mode)
09283	Turn off write inhibit, turn on CE-HAO
09559	Reset all switches

6.24.04.0 TYPEOUTS (OTHER THAN REQUESTS AND STANDARD TYPEOUTS)

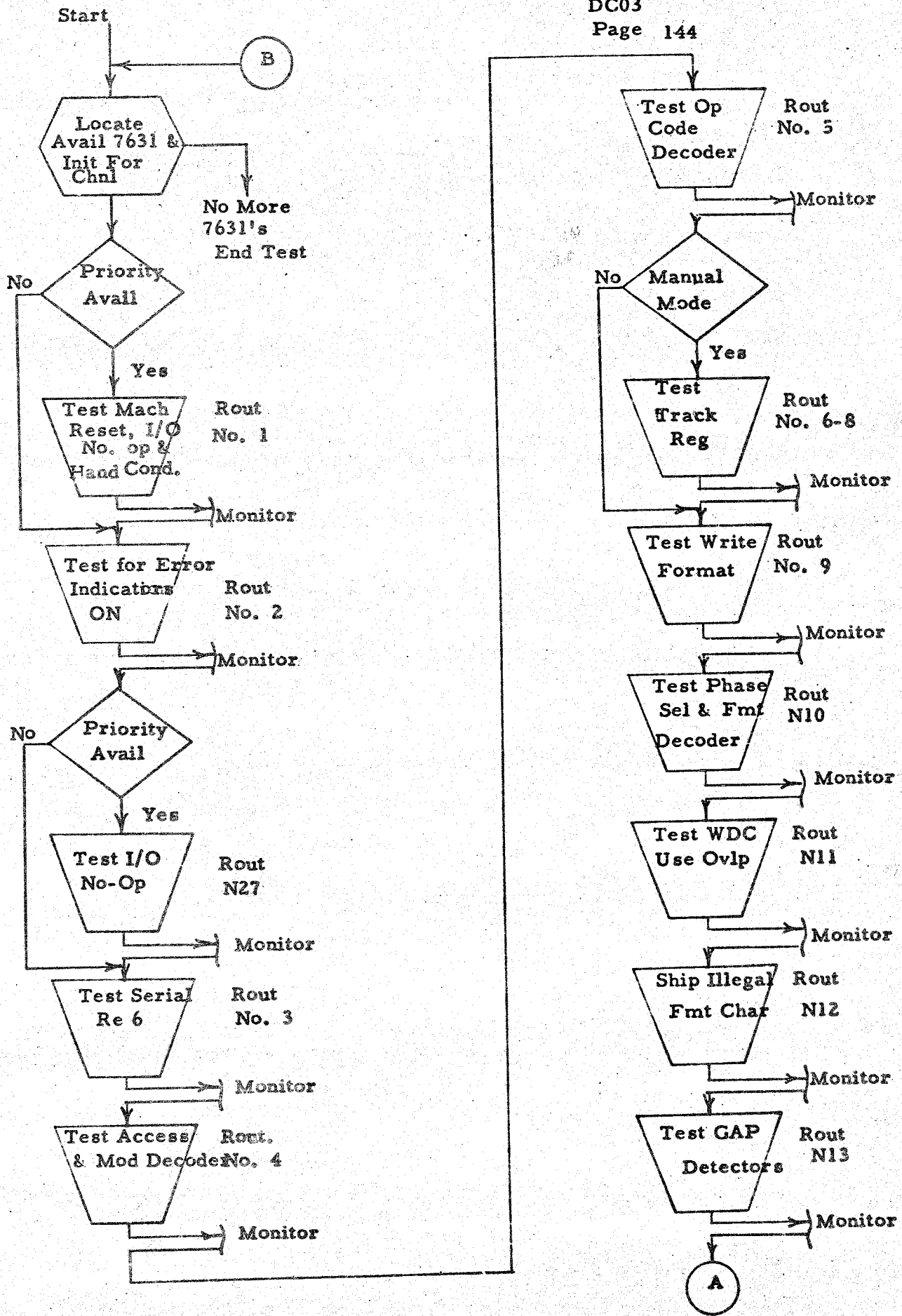
04.2 "TST CH0"

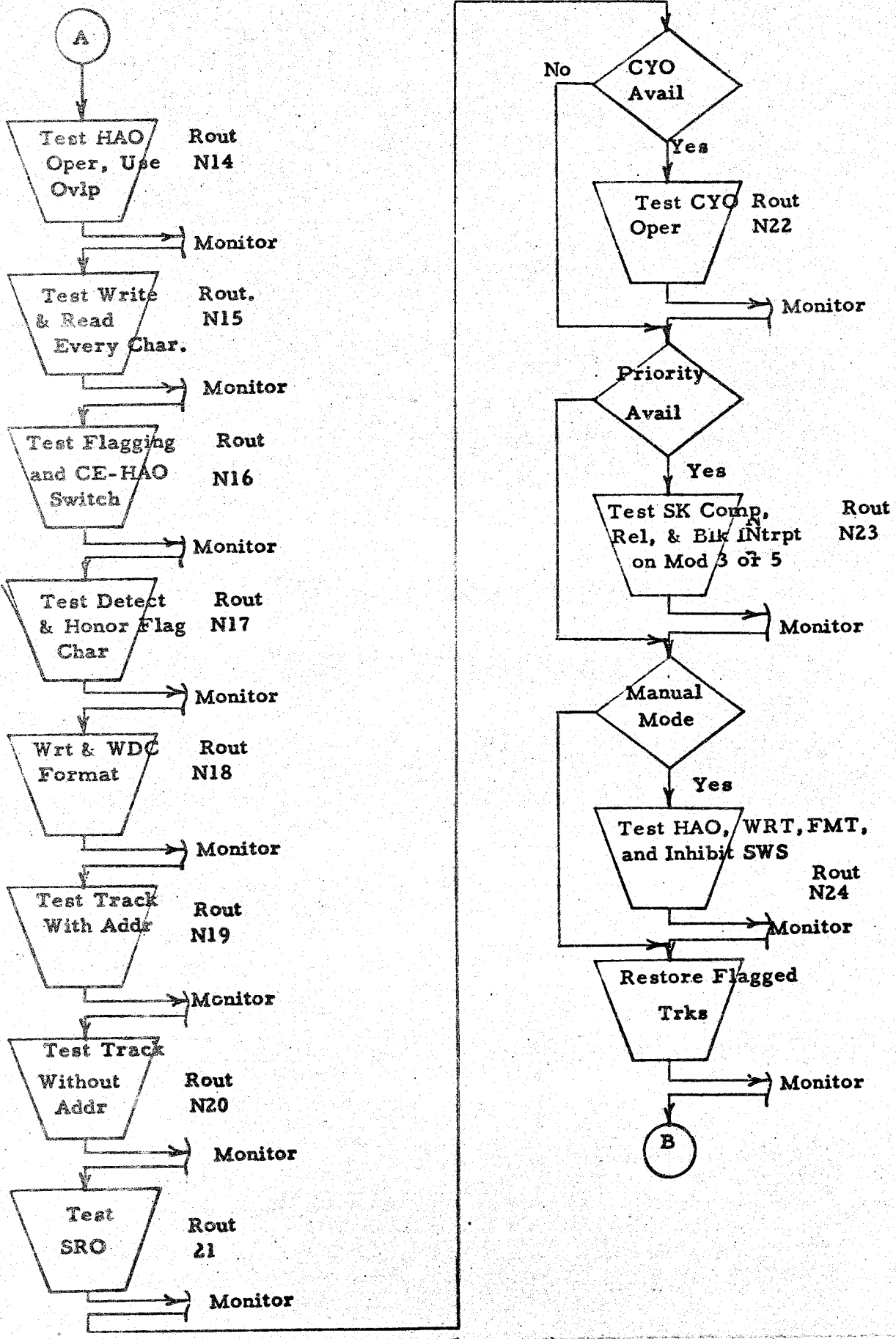
This tells the CE which channel is being tested.

04.2 Following the standard error message a third line of data, pertinent to the error, will be given with some errors. This will be the setting of the E or B register after the file op or the file address being used. Refer to the individual test routines for details.

6.24.05.0 FLOW CHART

The following flow chart is designed to give a general picture of the test routine's relationship to one another.


Start
B
Locate Avail 7631 & Init For Chnl
No More 7631's End Test
No
Priority Avail
Yes
Test Mach Reset, I/O No. op & Hand Cond.
Rout No. 1
Monitor
Test for Error Indications ON
Rout No. 2
Monitor
No
Priority Avail
Yes
Test I/O No-Op
Rout N27
Monitor
Test Serial Re 6
Rout No. 3
Monitor
Test Access & Mod Decoder
Rout. No. 4
Monitor
Test Op Code Decoder
Rout No. 5
Monitor
No
Manual Mode
Yes
Test Track Reg
Rout No. 6-8
Monitor
Test Write Format
Rout No. 9
Monitor
Test Phase Sel & Fmt Decoder
Rout N10
Monitor
Test WDC Use Ovlp
Rout N11
Monitor
Ship Illegal Fmt Char
Rout N12
Monitor
Test GAP Detectors
Rout N13
Monitor
A


A
Test HAO Oper, Use Ovlp
Rout N14
Monitor
Test Write & Read Every Char.
Rout. N15
Monitor
Test Flagging and CE-HAO Switch
Rout N16
Monitor
Test Detect & Honor Flag Char
Rout N17
Monitor
Wrt & WDC Format
Rout N18
Monitor
Test Track With Addr
Rout N19
Monitor
Test Track Without Addr
Rout N20
Monitor
Test SRO
Rout 21
Monitor
No
CYO Avail
Yes
Test CYO Oper
Rout N22
Monitor
Priority Avail
Yes
Test SK Comp, Rel, & Bik INtrpt on Mod 3 or 5
Rout N23
Monitor
Manual Mode
Yes
Test HAO, WRT, FMT, and Inhibit SWS
Rout N24
Monitor
Restore Flagged Trks
Monitor
B

6.24.06.0 ROUTINE/ERROR INDEX DC03

This index should be used to locate routines and errors in the program listing.

6.24.06.0 ROUTINE/ERROR INDEX DC03 (continued)

NOTES

```
                        DEFINE TADS
PGLIN     LABEL     OPCOD  OPERAND                    CT  ADDRS  INSTRUCTION
1002                ORG    1000                           01000
1003      TAD0      DCW    @ @                         1  01000
1004      TAD1      DCW    @ @                         1  01001
1005      TAD2      DCW    @ @                         1  01002
1006      TAD3      DCW    @ @                         1  01003
1007
1008                DEFINE SPECIAL TADS
1009
1010      SPTAD0    DCW    @ @                         1  01004
1011      SPTAD1    DCW    @ @                         1  01005
1012      SPTAD2           @ @                         1  01006
1013      SPTAD3           @ @                         1  01007
1014      SPTAD4           @ @                         1  01008
1015      SPTAD5           @ @                         1  01009
1016      SPTAD6           @ @                         1  01010
1017      SPTAD7           @ @                         1  01011
1018      SPTAD8           @ @                         1  01012
1019      SPTAD9           @ @                         1  01013
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1021                       *** I/O DICOST PROGRAM ***
1022                   *** ONE INSTRUCTION LOOP ROUTINE ***
1023          WHEN THE CE SELECTS A ONE INSTRUCTION LOOP THE I/O INSTRUCTION
1024        IN THIS ROUTINE IS ALTERED AND THE LOOP IS ENTERED.NOTE THAT THE
1025        BRANCH ON INQUIRY INSTRUCTION IS THE ONLY EXIT FROM THE LOOP.
1026      LOOP      MU     %11,0,R          I/O INST BEING LUP D     10  01014  M %11 00000 R
1027                BAI    *&1                                        7  01024  R 01031 G M
1028                BNQ    PRGCTL           BRCH ON INQ TO PRGCL      7  01031  J 02273 Q
1029                B      LOOP             CONTINUE TO LOOP          7  01038  J 01014
1030                H                                                 1  01045  .
1031
```

```
PGLIN    LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1033                    *** I/O DICOST PROGRAM ***
1034                *** CHANNEL ALTER ROUTINE ***
1035          THIS ROUTINE ALTERS ALL I/O INSTRUCTIONS,BRANCH-ON-STATUS-
1036          INDICATOR-ON INSTRUCTIONS,AND BRANCH ON CHANNEL OVERLAP IN PRO-
1037          CESS INSTRUCTIONS ACCORDING TO THE CHANNEL INDICATED.THIS IS DONE
1038          BY SCANNING A DEFINED AREA OF MEMORY AND ALTERING THESE INSTRUC-
1039          TIONS.
1040
1041     CHALTR    SBR     X5          STORE ADDR                    7  01046  G 00049 B
1042               MLCA    9&X5,X7     LOAD IX6 & IX7               12  01053  D 00#$9 00059 I
1043     SCAN      SCNLA   0&X6,0&X6   SCAN FOR WM                  12  01065  D 00#.0 00#.0 S B
1044               SAR     X6          STORE ADDR OF OPER            7  01077  G 00054 A
1045               C       X6,X7       HAS ALL OF FLD BEEN          11  01084  C 00054 00059
1046               BH      13&X5       SEARCHED IF SO BRCH           7  01095  J 00#/3 U
1047               MLCS    1&X6,*&12   STORE OP CODE                12  01102  D 00#.1 01125 3
1048               BCE     MLORU,CODES, IS OP CODE M                12  01114  B 01150 02586
1049               BCE                 IS OP CODE L                  1  01126  B
1050               BCE                 IS OP CODE C                  1  01127  B
1051               BCE     RX3OR1      IS OP CODE R                  6  01128  B 01169
1052               BCE                 IS OP CODE X                  1  01134  B
1053               BCE                 IS OP CODE 3                  1  01135  B
1054               BCE                 IS OP CODE 1                  1  01136  B
1055               BCE     JAY         IS OP CODE J                  6  01137  B 01188
1056               B       SCAN        GO FIND NEXT OPER             7  01143  J 01065
1057     MLORU     MLCS    10&X5,2&X6  CHEANGE CH-MODE CHAR          12  01150  D 00#/0 00#.2 3
1058               B       SCAN        GO FIND NEXT OPER             7  01162  J 01065
1059     RX3OR1    MLCS    11&X5,1&X6  CHANGE B-I-S-I-O OP           12  01169  D 00#/1 00#.1 3
1060               B       SCAN        GO FIND NEXT OPER             7  01181  J 01065
1061     JAY       MLCS    7&X6,*&12   STORE MODIFIER                12  01188  D 00#.7 01211 3
1062               BCE     ONE234,MODS, IS MODIFIER A 1              12  01200  B 01222 02590
1063               BCE                 IS MODIFIER A 2               1  01212  B
1064               BCE                 IS MODIFIER A 3               1  01213  B
1065               BCE                 IS MODIFIER A 4               1  01214  B
1066               B       SCAN        GO FIND NEXT OPER             7  01215  J 01065
1067     ONE234    MLCS    12&X5,7&X6  CHANGE BCL MODIFIER           12  01222  D 00#/2 00#.7 3
1068               B       SCAN        GO FIND NEXT OPER             7  01234  J 01065
1069               H                                                 1  01241  .
```

PGLIN LABEL OPCOD OPERAND CT ADDRS INSTRUCTION

```
PGLIN     LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION
1071
1072                ORG    1233                                           01233
1073                DCW    @FP6FMLFMTFMC385/2@                        17  01249
1074              DEFINE PROGRAM TITLE
1075                                                    **
1076                ORG    1250                                           01250
1077                DCW    @DC03B@,G                                   5  01254
1078
1079              LOCATE THE SYSTEM & CHANNEL CARDS
1080
1081                ORG    1256                                           01256
1082      SYSTEM    DC     @                                  @       50  01256
1083                       @      @                                    7  01312
1084                ORG    1289                                           01289
1085      CHNL1     DC     @                                  @       50  01289
1086                       @      @                                    7  01345
1087                ORG    1346                                           01346
1088      CHNL2     DC     @                                  @       50  01346
1089                       @      @                                    7  01402
1090                ORG    1403                                           01403
1091      CHNL3     DC     @                                  @       50  01403
1092                       @      @                                    7  01459
1093                ORG    1460                                           01460
1094      CHNL4     DC     @                                  @       50  01460
1095                       @      @                                    7  01516
1096
```

```
PGLIN     LABEL     OPCOD  OPERAND

1098                   *** I/O DICOST PROGRAM ***
1099                *** TYPE AND REQUEST FOR INTERVENTION ***
1100          THIS ROUTINE IS USED TO TYPE ALL MESSAGES AND REQUESTS FOR
1101          MANUAL INTERVENTION.THE ROUTINE WILL TYPE A MESSAGE FROM A COMMON
1102          DATA FIELD,OR THE MESSAGE MAY BE LOCATED IMMEDIATELY AFTER THE
1103          BRANCH INSTRUCTION TO THIS ROUTINE.IF A REPLY IS REQUIRED A READ
1104          CONSOLE PRINTER OPERATION IS ISSUED.THIS ROUTINE IS USED TO TYPE
1105          ALL MESSAGES IN THIS PROGRAM.
1106
1107      TYMES     SBR    TYPXIT&5        STORE RETURN ADDR
1108      TYPE      WCP    201             TYPE MESSAGE
1109                BEX1   TYPE,S,M        BRCH ON ANY BUT WLR
1110                BA1    *&1
1111      SW11      NCPWM
1112      LAB60     RCP    0               READ CONSOLE PRINTER
1113                BEX1   *-16,S,M        BRCH ON ANY BUT WLR
1114                BA1    *&1
1115                CW     SW11&1          TURN OFF SWITCH 11
1116                CS     33C             CLEAR PRINT AREA
1117                CS
1118      TYPXIT    B      0               RETURN TO DICOST
1119      TYP1      SBR    X1              STORE ADDR OF MESG
1120                B      *&14
1121      TYP2      SBR    X1              STORE ADDR OF MESG
1122                SW     REPLY&1         TURN ON REPLY SW
1123                WCP    0&X1            TYPE MESSAGE
1124                SBR    X5              SAVE ADDR
1125                BEX1   *-23,S,M        BRCH ON ANY BUT WLR
1126                BA1    *&1
1127      REPLY     NCPWM                  BRCH
1128                B      RDCON           IF REPLY REQUIRED
1129                B      0&X5            RETURN
1130      RDCON     RCP    0&X5            REPLY TO MESSAGE
1131                SBR    X1              SAVE ADDR
1132                BEX1   *-23,S,M        BRCH ON ANY BUT WLR
1133                BA1    *&1
1134                CW     REPLY&1

CT  ADDRS  INSTRUCTION
 7  01517  G 01591 B
10  01524  M %TO 00201 W
 7  01534  R 01524 S,M
 7  01541  R 01548 G,M
 1  01548  N
10  01549  M %TO 00000 R
 7  01559  R 01549 S,M
 7  01566  R 01573 G,M
 6  01573  ¤ 01549
 6  01579  / 00330
 1  01585  /
 7  01586  J 00000
 7  01593  G 00029 B
 7  01600  J 01620
 7  01607  G 00029 B
 6  01614  , 01652
10  01620  M %TO 000#0 W
 7  01630  G 00049 B
 7  01637  R 01620 S,M
 7  01644  R 01651 G,M
 1  01651  N
 7  01652  J 01666
 7  01659  J 00##0
10  01666  M %TO 00##0 R
 7  01676  G 00029 B
 7  01683  R 01666 S,M
 7  01690  R 01697 G,M
 6  01697  ¤ 01652
```

```
PGLIN     LABEL     OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1135                B      0&X1              RETURN          7  01703  J 000#0
1136      DATA      DCW    @        @                       12  01710
1137                BCE    *&13,1264,1       BRCH IF PRIORITY AVAIL  12  01722  B 01746 01264 1
1138                MLCWS  @N@,MONITR&7      ALTER PRIORITY INST TO NO-OP  12  01734  D 10484 02108 7
1139                MLCWS  @N@,PASS1         RESET 1ST PASS BRCH  12  01746  D 10484 01944 7
1140                MRCWG  *&9,1231                          12  01758  D 01778 01231 L
1141                B      PASS1&7                           7  01770  J 01951
1142                H                                        1  01777  .
1143                DC     @'73@                             3  01780
1144                DCW    @J@                               1  01781
1145                DC     SCAN                              5  01786  01065
1146                DC     @ @                               1  01787
1147                DCW    @.@,G                             1  01788
1148              *** ERROR TABLES THESE ARE USED FOR ERROR ***
1149              *** SUMMARIES AND ERROR INDENTIFICATION ***
1150
1151                ORG    *&X00                                01800
1152                ORG    *&1                                  01801
1153      STPTAB    DCW    @L@                               1  01801
1154      E1        DC     @ @                               1  01802
1155      E2                @ @                               1  01803
1156      E3                @ @                               1  01804
1157      E4                @ @                               1  01805
1158      E5                @ @                               1  01806
1159      E6                @ @                               1  01807
1160      E7                @ @                               1  01808
1161      E8                @ @                               1  01809
1162      E9                @ @                               1  01810
1163      E10               @ @                               1  01811
1164      E11               @ @                               1  01812
1165      E12               @ @                               1  01813
1166      E13               @ @                               1  01814
1167      E14               @ @                               1  01815
1168      E15       DC      @ @                               1  01816
1169      E16               @ @                               1  01817
1170      E17               @ @                               1  01818
1171      E18               @ @                               1  01819
1172      E19               @ @                               1  01820
```

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
1173	E20		a a	1	01821	
1174	E21		a a	1	01822	
1175	E22		a a	1	01823	
1176	E23		a a	1	01824	
1177	E24		a a	1	01825	
1178	E25	DC	a a	1	01826	
1179	E26	DC	a a	1	01827	
1180	E27		a a	1	01828	
1181	E28		a a	1	01829	
1182	E29		a a	1	01830	
1183	E30		a a	1	01831	
1184	E31		a a	1	01832	
1185	E32		a a	1	01833	
1186	E33		a a	1	01834	
1187	E34		a a	1	01835	
1188	E35		a a	1	01836	
1189	E36		a a	1	01837	
1190	E37		a a	1	01838	
1191	E38		a a	1	01839	
1192	E39		a a	1	01840	
1193	E40		a a	1	01841	
1194	E41		a a	1	01842	
1195	E42		a a	1	01843	
1196	E43		a a	1	01844	
1197	E44		a a	1	01845	
1198	E45		a a	1	01846	
1199	E46		a a	1	01847	
1200	E47		a a	1	01848	
1201	E48		a a	1	01849	
1202	E49		a a	1	01850	
1203	E50		a a	1	01851	
1204	E51	DC	a a	1	01852	
1205	E52		a a	1	01853	
1206	E53		a a	1	01854	
1207	E54		a a	1	01855	
1208	E55		a a	1	01856	
1209	E56		a a	1	01857	
1210	ERRTAB	DC	a+a	1	01858	

```
PGLIN     LABEL     OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1211                DC     @ @                               1  01859
1212
```

```
PGLIN     LABEL     OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1214                ***  INITIALIZE ROUTINE FOR THE DICOST PROGRAM ***
1215      INITLE    WCP    1250                PRINT TITLE  10  01860  M %TO 01250 W
1216                BCB1   *-16                              7  01870  R 01860 2
1217                BA1    *&1                               7  01877  R 01884 M
1218                CS     99                  RESET IND REG S  6  01884  / 00099
1219                SW     25                  SET WM IN IND REG 1  6  01890  , 00025
1220                MLCS   @*@,100             PREPARE TO LOAD 2-15  12  01896  D 10485 00100 3
1221                MRWR   25,30               LOAD IND REG 2-15  12  01908  D 00025 00030 &
1222                MRCWG  RESUME,1            MOVE RESET PROCEDURE  12  01920  D 02015 00001 L
1223                MRCWG  INTR,101            MOVE INTERUPT PROC  12  01932  D 02007 00101 L
1224      PASS1     B      DATA&12             GO DO MORE INITIALIZING  7  01944  J 01722
1225                CW     LPRT,SW11&1                      11  01951  ¤ 02598 01549
1226                CS     E56                 CLEAR AND RESET  6  01962  / 01857
1227                MLCWS  @L@,STPTAB           ERROR TABLE  12  01968  D 10486 01801 7
1228                B      START               GO TO ROUTINE INIT.  7  01980  J 03400
1229
1230                H                                       1  01987  .
1231                ORG    2000                             02000
1232                B      INITLE                           7  02000  J 01860
1233                ***  RESET & INTERUPT ROUTINES,THESE ROUTINES ***
1234                ***  ARE MOVED TO LOCATIONS 1 & 101
1235      INTR      BNQ    PRGCTL              RETURN TO PROG CNTRL  7  02007  J 02273 Q
1236                DCW    @M@                              1  02014
1237      RESUME    B      CKLUP                            7  02015  J 02023
1238                DCW    @M@                              1  02022
1239      CKLUP     BW     MONITR,LPRT         CHECK FOR LOOP ROUT  12  02023  V 02101 02598 1
1240                BW     LOOP,LPINST         CHECK INST LOOP SW  12  02035  V 01014 02599 1
1241                CW     SW11&1,REPLY&1      CLEAR TYPE SWITCHES  11  02047  ¤ 01549 01652
1242                CW     EXTRA&1                          6  02058  ¤ 03005
1243                CS     E56                 CLEAR ERROR TABLE  6  02064  / 01857
1244                MLCWS  @L@,STPTAB                       12  02070  D 10486 01801 7
1245                MLNA   X3,X2               LOAD IX 2  12  02082  D 00039 00034 /
1246                B      MONITR&7            GO TO MONITR  7  02094  J 02108
1247
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1249                    *** I/O DICOST PROGRAM ***
1250                ***       MONITOR ROUTINE       ***
1251          THE MONITOR IS ENTERED AFTER EVERY TEST ROUTINE IS COMPLETED,OR
1252        A STATUS ERROR HAS BEEN DETECTED AND INDICATED.IN THE CASE OF A
1253        STATUS ERROR MONITOR SIMPLY BRANCHES BACK TO THE POINT AT WHICH
1254        THE STATUS ERROR WAS DETECTED.WHEN ENTERED FROM THE END OF A
1255        TEST ROUTINE MONITOR CHECKS TO SEE IF THE CE PRESSED INQUIRY,THE
1256        ROUTINE IS BEING LOOPED,ANY ERRORS OCCURED,ALTER ROUTINE SEQUENCE
1257        IS SELECTED,OR THE NEXT SEQUENCIAL ROUTINE SHOULD BE RUN.
1258
1259     MONITR    SBR    X2                    STORE ADDR               7  02101  G 00034 B
1260               BXPA   *&1                   EXIT ALERT MODE          7  02108  Y 02115 X
1261               BNQ    PRGCTL                WAS THERE AN INQ         7  02115  J 02273 Q
1262     MCNIT1    BW     0&X3,LPRT             RETURN IF LOOPING RT    12  02122  V 000M0 02598 1
1263     MONIT2    MLCWS  @Ma,224               SET WMGM SHORT MESG     12  02134  D 10487 00224 7
1264               B      ERRCTL                                        7  02146  J 02658
1265     MCNIT3    NOP                                                  1  02153  N
1266               MLCWA  X2,X3                 LOAD IX3                12  02154  D 00034 00039 X
1267               MLCWS  @ @,224               CLEAR WMGM              12  02166  D 10488 00224 7
1268               B      0&X2                  GO TO NEXT ROUTINE       7  02178  J 000.0
1269     WHERE2    MLCWS  *-12,224              CLEAR WMGM              12  02185  D 02184 00224 7
1270               BCE    *&8,0&X2,N            BRCH IF ROUT COMP       12  02197  B 02216 000.0 N
1271               B      0&X2                  RETURN TO ROUTINE        7  02209  J 000.0
1272               BZN    *&8,1&X2,2            BRCH IF CHAR IS NUMR    12  02216  V 02235 000.1 2
1273               B      0&X2                  RETURN TO ROUTINE        7  02228  J 000.0
1274               BZN    *&8,2&X2,2            BRCH IF CHAR IS NUMR    12  02235  V 02254 000.2 2
1275               B      0&X2                  RETURN TO ROUTINE        7  02247  J 000.0
1276               BW     MONIT3,3&X2           BRCH IF CHAR HAS WM     12  02254  V 02153 000.3 1
1277               B      0&X2                  RETURN TO ROUTINE        7  02266  J 000.0
1278
```

```
PGLIN   LABEL    OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1280                    *** I/O DICOST PROGRAM ***
1281                ***       PROGRAM CONTROL       ***
1282          WHEN THE CE PRESSES INQUIRY TO SELECT A STANDARD PROGRAM OPTION
1283        THIS ROUTINE IS ENTERED.THE CE ENTERS ON THE TYPEWRITER THE
1284        OPTION CODE DESIRED,ALONG WITH THE DATA NEEDED BY THE OPTION.THE
1285        ROUTINE DETERMINES WHICH OPTION HAS BEEN SELECTED AND INITIATES
1286        THE OPTION.
1287
1288    PRGCTL      RCPW    CTLFLD          READ THE CONSOLE PRT             10  02273  L %TO 00201 R
1289                SBR     X1                                               7  02283  G 00029 B
1290                BEX1    PRGCTL,*M       BRCH ON ANY BUT WLR              7  02290  R 02273 SM
1291                SW      CTLFLD&1                                         6  02297  , 00202
1292                BAL     *&1                                              7  02303  R 02310 GM
1293                CW      LPRT,LPINST     TURN OFF LOOP SWS                11  02310  ¤ 02598 02599
1294                MLWS    *,E1            CLEAR WM IN ERRCR                12  02321  D 02332 01802 4
1295                MRWR    E1,E2             TABLE                          12  02333  D 01802 01803 %
1296                MLCS    CTLFLD,*&12     MOVE CTL CODE ENTERD             12  02345  D 00201 02368 3
1297                BCE     ENDTST,CTLCOD,  IS CTL CODE BLANK                12  02357  B 09896 02597
1298                BCE     ALTADS          IS CTL CODE 1                     6  02369  B 02412
1299                BCE     ALTMEM          IS CTL CODE 2                     6  02375  B 02435
1300                BCE     LUPRT           IS CTL CODE 4                     6  02381  B 02482
1301                BCE     ONELUP          IS CTL CODE 5                     6  02387  B 02511
1302                BCE     RSTART          IS CTL CODE 6                     6  02393  B 02545
1303                BCE     CONT            IS CTL CODE 7                     6  02399  B 02568
1304                B       PRGCTL                                           7  02405  J 02273
1305    ALTADS      MLCA    CTLFLD&4,1003   MOVE IN NEW TADS                 12  02412  D 00205 01003 I
1306                CS      MONIT1,299      CLEAR OUT CTL FLD                11  02424  / 02122 00299
1307    ALTMEM      MLCA    CTLFLD&5,*&9    MOVE ADDR TO BE ALTR             12  02435  D 00206 02455 I
1308                RCPW    0               ALTER MEMORY                     10  02447  L %TO 00000 R
1309                BEX1    *-16,*M         CHECK ALL BUT WLR                 7  02457  R 02447 SM
1310                BAL     *&1                                              7  02464  R 02471 GM
1311                CS      MONIT1,299      CLEAR THE CNTRL FLD              11  02471  / 02122 00299
1312    LUPRT       SW      LPRT            TURN ON LOOP SWITCH               6  02482  , 02598
1313                MLNA    CTLFLD&5,X2     LOAD IND REG2                    12  02488  D 00206 00034 /
1314                CS      MONIT2,299      CLEAR CNTRL FLD                  11  02500  / 02134 00299
1315    ONELUP      SW      LPINST          TURN ON LOOP INST SW              6  02511  , 02599
1316    LUPINT      NOPWM                   THIS SW IS TURNED ON              1  02517  N
```

```
PGLIN  LABEL    OPCOD  OPERAND                    CT  ADDRS  INSTRUCTION
1317            B      *&8          BY ERRCTL      7  02518  J 02532
1318            B      PREP         GO TO PREPARE ROUT  7  02525  J 09984
1319            CW     LUPINT&1     TURN OFF SW    6  02532  ¤ 02518
1320            B      LOOP                        7  02538  J 01014
1321    RSTART  MLNA   CTLFLD&5,X2  LOAD IND REG2  12  02545  D 00206 00034 /
1322            CS     MONIT2,299   CLEAR CNTRL FLD  11  02557  / 02134 00299
1323    CONT    CS     WHERE2,299   CLR CNTL FLD    11  02568  / 02185 00299
1324
1325            I/C DICOST CONSTANTS
1326    CODES   DCW    @J13XRULM@                     8  02586
1327    MODS    DCW    @43218@                        4  02590
1328            DCW    @7@                            1  02591
1329            DC     @6@                            1  02592
1330                   @5@                            1  02593
1331                   @4@                            1  02594
1332                   @2@                            1  02595
1333                   @1@                            1  02596
1334    CTLCOD         @ @                            1  02597
1335    LPRT    DC     @ @                            1  02598
1336    LPINST  DC     @ @                            1  02599
1337    ADDR02  DCW    ERRTAB       ADDR OF ERR TABLE  5  02604  01858
1338    ERR     DCW    @*ERROR@                       6  02610
1339     ACTION DC     @REQ ERROR ACTION@,G          16  02611
1340    ERCODE  DCW    @547P@                         4  02631
1341     SAVIND DCW    @1 2 4 8 A B@,G               11  02632
1342     STIND  DC     @1 2 4 8 A B@,G               11  02644
1343     NOERSW DC     @ @                            2  02656
1344
```

```
PGLIN    LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1346                     *** I/O DICOST PROGRAM ***
1347                 ***       ERROR CONTROL       ***
1348           THIS ROUTINE DETERMINES IF ANY STATUS ERRORS OR PROGRAM DETECT-
1349         ED ERRORS HAVE TO BE INDICATED.IF THERE ARE THIS ROUTINE BUILDS
1350         THE ERROR MESSAGE AND HAS IF TYPED OUT.THIS ROUTINE ALSO CHECKS
1351         TAD 1 TO SEE IF A REQUEST FOR ERROR ACTION SHOULD BE MADE.
1352
1353                 LOCATE FAILING INST
1354
1355      ERRCTL     MLCA   X2,X5              LOAD IND REG 5            12  02658  D 00034 00049 I
1356                 S      @1&,X5                                      11  02670  S 10489 00049
1357                 SCNLA  0&X5,0&X5          SCAN THE ROUTINE          12  02681  D 00‡‡0 00‡‡0 SB
1358                 SAR    X5                 STORE CHAR ADDR            7  02693  G 00049 A
1359                 MLCS   1&X5,*&12          MOVE CHAR TO BE CHKD      12  02700  D 00‡‡1 02723 3
1360                 BCE    GOTONE,CODES,      IS OP CODE M              12  02712  B 02756 02586
1361                 BCE                       IS OP CODE L               1  02724  B
1362                 BCE    SHORT1             IS OP CODE U               6  02725  B 02775
1363                 C      X3,X5              HAS ROUTINE BEEN          11  02731  C 00039 00049
1364                 BL     LOOFLD              SEARCHED                  7  02742  J 02799 I
1365                 B      ERRCTL&12          GO CONTINUE THE SRCH       7  02749  J 02670
1366      GOTONE     MLCWA  10&X5,LOOP&9       LOAD THE LOOP INST        12  02756  D 00‡/0 01023 X
1367                 B      LOOFLD                                        7  02768  J 02799
1368      SHORT1     MLCWA  5&X5,LOOP&9        LOAD THE LOOP INST        12  02775  D 00‡‡5 01023 X
1369                 MLCS   @N&,LOOP           SET NO-OP FOR SHORT       12  02787  D 10484 01014 3
1370                                          INSTRUCTION
1371      LOOFLD     MLCA   LOOP&9,234         MOVE FAILING OPER         12  02799  D 01023 00234 I
1372                 MLNA   X3,223             MOVE ADDR OF ROUT         12  02811  D 00039 00223 /
1373                 ZA     ADDR02,X1          LOAD ND REG 1             11  02823  DQMQ 02604 00029
1374                 ZA     @002098,X5         LOAD IND REG 5            11  02834  M 10494 00049
1375                     SCAN ERROR TABLE & UPDATA ERROR COUNT
1376      ERSCAN     SCNLA  0&X1,0&X1          SCAN THE ERROR TABLE      12  02845  D 000‡0 000‡0 SB
1377                 SAR    X1                 STORE ADDR                 7  02857  G 00029 A
1378                 BCE    AFTSRH,1&X1,LD     HAS TABLE BEEN COMP.      12  02864  B 02923 000‡1 DL
1379                 SW     X1-1              DEFINE ERROR               6  02876  , 00028
1380                 MLNWA  X1,0&X5            MOVE ERROR CODE NO.       12  02882  D 00029 00‡‡0 V
1381                 A      @3&,X5             UPDATE IND REG 5          11  02894  A 10495 00049
1382                                          NINE TIMES
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1383                CW     1&X1,X1-1          CLEAR WM S            11  02905  ¤ 000#1 00028
1384                B      ERSCAN                                    7  02916  J 02845
1385                     LOAD PRINT FIELD WITH ERROR MESG
1386      AFTSRH    BCE    WHERE2,1000,1      BRCH IF BYPASSING ERRORS 12  02923  B 02185 01000 1
1387      ERROSW    NOP                                              1  02935  N
1388                BCE    WHERE2,209         BRCH IF NO ERRORS     12  02936  B 02185 00209
1389                SW     ERROSW&1           RESET ERROR SW         6  02948  , 02936
1390                MLCA   ERR,206            MOVE ERROR            12  02954  D 02610 00206 T
1391                MLCA   2&X3,ROUTID        MOVE ROUTINE IDENT    12  02966  D 000M2 02995 T
1392                B      TYP1               GO TYPE ROUTINE ID     7  02978  J 01593
1393                DCW    @ROUTINE @                                8  02992
1394      ROUTID    DC     @   @,G                                   3  02995
1395                B      TYMES                                     7  02997  J 01517
1396                     TYPE ADDITIONAL  ERROR INFORMATION
1397      EXTRA     NOPWM                                            1  03004  N
1398                WCP    DATA               PRINT EXTRA DATA      10  03005  M %T0 01710 W
1399                BCB1   *-16                                      7  03015  R 03005 2
1400                BA1    *&1                                       7  03022  R 03029 M
1401                CW     EXTRA&1                                   6  03029  ¤ 03005
1402      ACT       BCE    *&8,1001,1         LOOP ACTION REQUIRED  12  03035  B 03054 01001 1
1403                B      WHERE2                                    7  03047  J 02185
1404                SW     LUPINT&1           TURN ON SWITCH         6  03054  , 02518
1405                MRCWG  ACTION,201         MOVE ACTION MESG      12  03060  D 02611 00201 L
1406                B      TYMES                                     7  03072  J 01517
1407                B      PROCTL                                    7  03079  J 02273
1408
1409                  *** I/O DICOST PROGRAM ***
1410               *** DETERMINE WHICH STATUS INDICATORS ARE ON ***
1411          THIS ROUTINE DETERMINES WHICH STATUS INDICATORS ARE ON,ON THE
1412        CHANNEL BEING USED.THE INDICATORS FOUND  ON ARE STORED IN THE
1413        PRINT FIELD AND THE PROGRAM BRANCHES TO ERROR CONTROL.
1414      STACHK    SBR    X5                 STORE ADDR IN IND 5    7  03086  G 00049 B
1415                SBR    X2                                        7  03093  G 00034 B
1416                BW     0&X2,LPRT                                12  03100  V 000.0 02598 1
1417                S      @7@,X5             REDUCE ADDR BY 7      11  03112  S 10496 00049
1418                MLCS   0&X5,LOOP&10                             12  03123  D 00##0 01024 3
1419                MRCWG  STIND,237          MOVE STATUS CODES     12  03135  D 02644 00237 L
```

```
PGLIN  LABEL    OPCOD  OPERAND                  CT  ADDRS  INSTRUCTION
1420            MLCS   0&X5,NUOPCO              STORE CHNL CODE      12  03147  D 00#0 03177 3
1421            B      CHALTR                                        7  03159  J 01046
1422            DCW    CNTERR                   HIGH LIMIT           5  03170  03332
1423            DC     NOTRDY                   LOW LIMIT            5  03175  03190
1424            DCW    @ @                                           1  03176
1425    NUOPCO  DC     @ @                                           1  03177
1426            DC     @ @                                           1  03178
1427            ZA     @00237@,X5               LOAD IX 5            11  03179  Q
                                                                                  M 10501 00049
1428    NOTRDY  NOP                                                   1  03190  N
1429            BNR1   CNTERR                    CHECK FOR NOT READY  7  03191  R 03332 1
1430            B      UPIX                     GO UPDATE IND REG    7  03198  J 03363
1431    BUSY    NOP                                                   1  03205  N
1432            BCB1   CNTERR                    CHECK FOR BUSY       7  03206  R 03332 2
1433            B      UPIX                     GO UPDATE IND REG    7  03213  J 03363
1434    DATACK  NOP                                                   1  03220  N
1435            BER1   CNTERR                    CHECK DATA CNK       7  03221  R 03332 4
1436            B      UPIX                     GO UPDATE IND REG    7  03228  J 03363
1437    EXTCND  NOP                                                   1  03235  N
1438            BEF1   CNTERR                    CHECK FOR EXT COND   7  03236  R 03332 8
1439            B      UPIX                     GO UPDATE IND REG    7  03243  J 03363
1440    NOTRNS  NOP                                                   1  03250  N
1441            BNT1   CNTERR                    CHECK FOR NO TRANS   7  03251  R 03332 $
                                                                                  B
1442            B      UPIX                     GO UPDATE IND REG    7  03258  J 03363
1443    WLR     NOP                                                   1  03265  N
1444            BWL1   CNTERR                    CHECK FOR WLR        7  03266  R 03332 -
1445            B      UPIX                     GO UPDATE IND REG    7  03273  J 03363
1446            SW     NOTRDY&1,BUSY&1          RESET INSTRUCTIONS   11  03280  , 03191 03206
1447            SW     DATACK&1,EXTCND&1                             11  03291  , 03221 03236
1448            SW     NOTRNS&1,WLR&1                                11  03302  , 03251 03266
1449            MRCG   237,SAVIND               SAVE IND             12  03313  D 00237 02632 $
1450            B      ERRCTL                   RETURN               7  03325  J 02658
1451    CNTERR  SBR    X6                       STORE RETURN ADDR    7  03332  G 00054 B
1452            A      @7@,X6                   UPDATE RETURN ADDR   11  03339  A 10496 00054
1453            CW     ERROSW&1                 TURN OFF ERROR SW    6  03350  ¤ 02936
1454            B      UPIX&19                                       7  03356  J 03382
1455    UPIX    SBR    X6                       STORE RETURN ADDR    7  03363  G 00054 B
1456            MLCS   @ @,0&X5                 REMOVE STATUS CHAR   12  03370  D 10488 00#0 3
```

I/O DICOST ERROR CONTROL

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1457		A	a2a,X5	UPDATE IND REG 5	11	03382	A 10502 00049
1458		B	0&X6	RETURN TO PROGRAM	7	03393	J 00+'0

```
PGLIN     LABEL     OPCOD  OPERAND                    CT  ADDRS  INSTRUCTION
1460      CTLFLD    EQU    201
1461                PST
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1463                ***  INITIALIZE COUNTERS,SWITCHES,AND INDEX REG ***
1464                     *** SELECT MODE ***
1465      START     CW     ONE3SW&1,THREE1&1  CLEAR                  11  03400  D 05555 05650
1466                S      TENCNT             RESET COUNTER           6  03411  S 09991
1467                ZA     @0C00@,X14         RESET IX 14            11  03417  MQM 10506 00094
1468                ZA     @1275@,X15         LOAD IX 15             11  03428  MQM 10510 00099
1469                B      *&13                                       7  03439  J 03458
1470                MLCA   @30@,CCN2                                 12  03446  DQM 10512 10141 T
1471                ZA     &N26,X3            LOAD IX 3              11  03458  MQM 10517 00039
1472                B      N26                                        7  03469  J 09542
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1474
1475                ***  TEST ROUTINE DESCRIPTION  ***
1476                *** RESET 7631,TEST CONTROL TRIGGER & END CP ***
1477          THIS TEST REQUESTS A MACHINE RESET TO RESET ALL LATCHES IN THE
1478         7631.THEN IF PRIORITY IS AVAILABLE AN OVERLAPPED I/O NC-OP IS
1479         ISSUED,FOLLOWING A SHORT DELAY THE OVERLAP IN PROCESS IS TESTED.
1480         IF OVERLAP IN PROCESS IS ON IT INDICATES THAT THE 7631 HAS HUNG
1481         UP AND THE MACHINE IS RESET BY ISSUING AN ILLEGAL INSTRUCTION.IF
1482         THIS HAPPENS ERROR 01 IS INDICATED,INCLUDED IN THE ERROR MESSAGE
1483         WILL BE THE CONTENTS OF THE E REGISTER.SHOWING HOW MANY CHARACTER
1484         WHERE TRANSFERED BEFORE THE 7631 HUNG UP.
1485
1486      NO1       NOP                                                      1  03476  N
1487                CC      @01@              ROUTINE ID                     2  03478
1488                MRCWG   BRCH0,1           MOVE RESET BRCH INST          12  03479  D 10004 00001 DL
1489                B       TYP1                                             7  03491  J 01593
1490                DCW     @CCMP RESET,CHK 7631@,G                         19  03516
1491                H                         WAIT FOR ACTION                1  03518  .
1492      RESET1    MRCWG   RESUME,1          RESTORE LOC 1                 12  03519  D 02015 00001 DL
1493                BCE     *&8,1264,1        BRCH IF PRICRITY AVA          12  03531  B 03550 01264 1
1494      BOTTOM    B       NO1XIT                                           7  03543  J 03685
1495                MRCG    CEADDR,FILE       SET FILE ADDR                 12  03550  D 10342 10891 $
1496                MLCS    OVRLAP&X14,*&2    MOVE OVER LAP CODE            12  03562  D 10DP1 03575 3
1497                MU      @FC,FILE,V        I/O NO-OP OVERLAPPED          10  03574  M @FO 10891 V
1498      DELAY1    A       @1@,TENCNT        WAIT FOR OVERLAP              11  03584  A 10489 09991
1499                BZ      *&8                   TO DROP ON 7010            7  03595  J 03609 V
1500                B       DELAY1                                           7  03602  J 03584
1501                BCLI    *&15              BRCH OVERLAP IN PROC           7  03609  J 03630 IG
1502                BAI     *&1                                              7  03616  R 03623 M
1503                B       NO1XIT                                           7  03623  J 03685
1504                SER     DATA&4            STORE ADDR REG                 7  03630  G 01714 E
1505                MRCWG   EREG,DATA&18      MOVE E REG MESSAGE            12  03637  D 09992 01728 DL
1506                MRCWG   BRCH1,1           MOVE BRCH INST TO 1           12  03649  D 10012 00001 DL
1507                DCW     @MG@                                             1  03661
1508      HANG1     MRCWG   RESUME,1          RESTORE LOCATION 1            12  03662  D 02015 00001 DL
1509                ***  SET ERROR 01 ON ***
1510                SW      E1,EXTRA&1        TURN ON ERROR IND             11  03674  , 01802 03005
15--          763* HAS --NG IN OVERL--,POSS-BLE C-USE,CONTROL TRIGGER OR END OP
```

```
PGLIN     LABEL      OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION

1512        FAILING. CHECK E REG CONTENTS FOR POSSIBLE CLUE.-E REG SETTING
1513        TYPED IN ERROR MESSAGE-
1514      NO1XIT     B      MONITR                                      7  03685  J 02101
```

```
PGLIN    LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
1516
1517                ***  TEST ROUTINE DESCRIPTION  ***
1518                *** TEST ERROR CONDITIONS ON 7631 AFTER MACHINE RESET ***
1519          THIS ROUTINE CHECKS FOR ANY STATUS INDICATORS TURNED ON BY THE
1520          I/O NO-OP ISSUED IN ROUTINE NO1.-A SEEK OP IS USED IF PRIORITY IS
1521          NOT AVAILABLE-IF ANY INDICATORS ARE FOUND ON ERROR 02 IS
1522          INDICATED.
1523     NO2        NOP
1524                DC      @02@                ROUTINE ID                    1  03692  N
1525                BCE     INCON,1264,1        BRCH IF PRIORITY              2  03694
1526                MRCG    CEADDR,FILE         SET FILE ADDR                12  03695  B 03729 01264 1
1527                SC      1,FILE              SEEK DISK                    12  03707  D 10342 10891 &
1528     INCON      BA1     *&8                 CHECK FOR ANY IND            10  03719  M %FO 10891 R
1529                B       NO2XIT                                            7  03729  R 03743 GM
1530                ***  SET ERROR 02 ON ***                                  7  03736  J 03749
1531                SW      E2                  TURN ON ERROR IND             6  03743  , 01803
1532          STATUS INDICATOR TURNED ON BY 7631 AFTER A MACHINE RESET,POSSIBLE
1533          TROUBLE WITH ERROR LATCHES IN 7631.
1534     NO2XIT     B       MONITR                                            7  03749  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1536                THIS ROUTINE CHECKS THE SEEK TEST OR I/O NO-OP INST TO INSURE
1537              THAT THE 7631 DOES NOT TREAT IT AS A NORMAL SEEK.TWO SUCCESSIVE
1538              SEEKS ARE ISSUED TO THE SAME LOCATION TO INSURE BUSY IS DOWN.A
1539              SEEK TEST TO ANOTHER LOCATION IS ISSUED FOLLOWED BY A NORMAL SEEK
1540              IF BUSY IS UP THE SEEK TEST CAUSED THE ACCESS TO MOVE AND ERROR
1541              17 IS INDICATED.THIS ROUTINE IS RUN ONLY IF PRIORITY IS AVAILABLE
1542
1543      N27     NCP                                               1  03756  N
1544              DC      @27@                                      2  03758
1545              BCE     *&8,1264,1        BRCH IF PRIORITY AVAIL  12  03759  B 03778 01264 1
1546              B       N27XIT                                    7  03771  J 03911
1547              SC      1,FILE            POSITION ACC            10  03778  M %F0 10891 R
1548              BCB1    *-16                                      7  03788  R 03776 2 G
1549              BA1     *&1                                       7  03795  R 03802 M
1550              SC      1,FILE            INSURE THAT BUSY LINE IS DOWN  10  03802  M %F0 10891 R
1551              BCB1    *-16                                      7  03812  R 03802 2 G
1552              BA1     *&1                                       7  03819  R 03826 M
1553              MLCA    @0000@,FILE&5     RESET FILE ADDR         12  03826  D 10506 10896 T
1554              MU      @F0,FILE,V        I/O NO-OP SEEK          10  03838  M @F0 10891 V
1555              BCB1    *-16                                      7  03848  R 03838 2 G
1556              BA1     *&1                                       7  03855  R 03862 M
1557              MRCG    CEADDR,FILE       RESTORE FILE ADDR       12  03862  D 10342 10891 $
1558              SC      1,FILE            SEE IF NO-OP CAUSED ACC TO MOVE  10  03874  M %F0 10891 R
1559              BCB1    *&15              BRCH IF BUSY IS ON      7  03884  R 03905 2 G
1560              BA1     *&1                                       7  03891  R 03898 M
1561              B       N27XIT                                    7  03898  J 03911
1562                    *** SET ERROR 17 ON ***
1563              SW      E17               SET ERROR IND ON        6  03905  , 01818
1564          I/O NO-OP TREATED AS NORMAL SEEK BY 7631
1565    N27XIT    B       MONITR                                    7  03911  J 02101
```

```
PGLIN   LABEL    OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1567
1568                    ***  TEST ROUTINE DESCRIPTION  ***
1569                    *** TEST SERIAL REG AND PARITY TRIGGER ***
1570              USING A SEEK OP ALL 64 CHARS ARE SHIPPED TO THE 7631 IN THE HA2
1571             PORTION OF THE FILE ADDRESS,ONE CHARACTER AT A TIME.WHEN EVER A
1572             DATA CHECK OCCURES THE CHARACTER BEING USED IS STORED AND THE
1573             ROUTINE CONTINUES UNTIL ALL 64 CHARACTERS HAVE BEEN TESTED.IF ANY
1574             ONE OR MORE CHARACTERS CAUSED A DATA CHECK ERROR 03 IS INDICATED
1575             AND THE FAILING CHARACTERS ARE TYPED OUT.IF MORE THAN ONE CHAR.
1576             FAILED,ANALYSIS OF THE BIT MAKE UP WILL AID IN LOCATING THE BUG.
1577    NO3      NOP                                                      1  03918  N
1578             DC       @03@            ROUTINE ID                      2  03920
1579             ZA       @0000@,X10      LOAD IX 10                     11  03921  QM 10506 00074
1580             ZA       @0000@,X11      LOAD IX 11                     11  03932  QM 10506 00079
1581    CHKCHR   SC       1,FILE          SEEK ACC                       10  03943  M %F0 10891 R
1582             BA1      *&1                                             7  03953  R 03960 GM
1583             BER1     BADCHR          BRCH ON DATA CHECK              7  03960  R 04021 4
1584    NEXCHR   A        @1@,X10         UP DATE X10                    11  03967  A 10489 00074
1585             MLCS     ALLCHR&X10,FILE&7  MOVE TEST CHAR              12  03978  D 10'K6 10898 3
1586             MLCS     ALLCHR&X10                                      6  03990  D 10'K6
1587             C        X10,@6C@        HAVE ALL CHAR BEEN             11  03996  C 00074 10519
1588             BE       NO3XIT           CHECKED                        7  04007  J 04062 S
1589             B        CHKCHR                                          7  04014  J 03943
1590    BADCHR   MRCWG    FILE&7,DATA&X11                                12  04021  D 10898 01PA0 DL
1591                    ***  SET ERROR 03 ON ***
1592             SW       EXTRA&1,E3      TURN ON ERROR IND              11  04033  , 03005 01804
1593             ONE OR MORE CHARACTERS CAUSED PARITY ERROR ON A SEEK OP.FAILING
1594             CHARACTERS APPEAR AS 3RD LINE OF ERROR MESSAGE.
1595             A        @1@,X11         UPDATE X 11                    11  04044  A 10489 00079
1596             B        NEXCHR                                          7  04055  J 03967
1597    NO3XIT   B        MONITR                                          7  04062  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1599
1600                ***  TEST ROUTINE DESCRIPTION  ***
1601                ***  TEST SET ACCESS INOP,ACCESS & MODULE DECODER  ***
1602          EVERY ACCESS ADDRESS POSSIBLE IS USED WITH A SET ACCESS INOP
1603          OPERATION,EACH ACCESS ON EVERY MODULE IS THEN SELECTED AND CHECK-
1604          ED FOR NOT READY,IF ANY ARE NOT ERROR 4 IS INDICATED.THE SELECTED
1605          ACCESS&MODULE IS NOT SET INOP IT IS CHECKED TO INSURE THAT IT HAS
1606          REMAINED READY,IF NOT ERROR 5 IS INDICATED.
1607
1608      NO4       NOP                                                    1  04069  N
1609                DC      @04@                ROUTINE ID                 2  04071
1610                MLCWA   @00@,FILE&1         LOAD FILE ACC&MOD ADDR     12 04072  D 10521 10892 X
1611      CHKAMA    C       FILE&1,CEADDR&1     CHECK ADDR TO SELECTED ACC/MOD 11 04084  C 10892 10343
1612                BE      *&25                BRCH IF THIS IS IT         7  04095  J 04126 S
1613                MU      %F8,FILE,R          ISSUE SET ACCESS INOP      10 04102  M %F8 10891 R
1614                BC81    *-16                                           7  04112  R 04102 2
1615                BA1     *&1                                            7  04119  R 04126 M G
1616                A       @1@,FILE            UPDATE FILE ACCESS ADDR    11 04126  A 10489 10891
1617                BCE     *&8,FILE,2          BRCH WHEN ADDR GOES TO 2   12 04137  B 04156 10891 2
1618                B       CHKAMA                                         7  04149  J 04084
1619                S       FILE                RESET ACC ADDR             6  04156  S 10891
1620                A       @1@,FILE&1          UPATE FILE MODULE ADDR     11 04162  A 10489 10892
1621                BCE     *&8,FILE&1,0        BRCH WHEN ADDR GOES TO 0   12 04173  B 04192 10892 0
1622                B       CHKAMA                                         7  04185  J 04084
1623                MLCA    @00@,FILE&1         RESET FILE ADDR            12 04192  D 10521 10892 I
1624      CHKAM     C       FILE&1,CEADDR&1     CHECK FOR ADDR EQUAL TO SLTD ACC 11 04204  C 10892 10343
1625                BE      NXTACS                MOD ADDR,BRCH IF THIS IS IT 7  04215  J 04276 S
1626                SC      1,FILE              CHECK FOR NOT READY        10 04222  M %F0 10891 R
1627                BA1     *&1                                            7  04232  R 04239 M G
1628                BNR1    NXTACS              BRCH ON NOT READY          7  04239  R 04276 1
1629                SW      E4,EXTRA&1          TURN ON ERROR IND          11 04246  , 01805 03005
1630                MRCWG   FILE,DATA           LOAD ADDR INTO ERROR DATA FLD 12 04257 D 10891 01710 D L
1631          AN ACCESS THAT WAS SET INOP DOES INDICATE NOT READY,FILE ADDRESS
1632          USED APPEARS IN ERROR MESSAGE.
1633                B       MONITR                                         7  04269  J 02101
1634      NXTACS    A       @1@,FILE            UPDATE FILE ACCESS ADDR    11 04276  A 10489 10891
1635                BCE     *&8,FILE,2          BRCH IF ADDR IS 2          12 04287  B 04306 10891 2
```

```
PGLIN   LABEL    OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1636             B      CHKAM                             7  04299  J 04204
1637             A      @1&,FILE&1                       11  04306  A 10489 10892
1638             S      FILE                              6  04317  S 10891
1639             BCE    *&8,FILE&1,0                     12  04323  B 04342 10892 0
1640             B      CHKAM                             7  04335  J 04204
1641             MRCWG  CEADDR,FILE                      12  04342  D 10342 10891 D L
1642             SC     1,FILE                           10  04354  M %F0 10891 M
1643             BCB1   *-16                              7  04364  R 04354 2
1644             BA1    *&1                               7  04371  R 04378 G M
1645             BNR1   *&8                               7  04378  R 04392 1
1646             B      *&14                              7  04385  J 04405
1647             SW     E5                                6  04392  , 01806
1648       SELECTED ACCESS WENT NOT READY WHEN ALL ACCESSES WHERE SET INOP,
1649       POSSIBLE FAILURE IN ACC/MOD DECODERS
1650             B      MONITR                            7  04398  J 02101
1651             MLCA   @2C@,FILE&1                      12  04405  D 10523 10892 I
1652   NOACC     SC     1,FILE                           10  04417  M %F0 10891 R
1653             BA1    *&1                               7  04427  R 04434 G M
1654             BNR1   NXTIAC                           7  04434  R 04471 1
1655             SW     E6,EXTRA&1                       11  04441  , 01807 03005
1656       ILLEGAL ACCESS ADDR USED WITH A SEEK DOES NOT RESULT IN A NOT
1657       READY,FILE ADDR USED APPEARS IN THE ERROR MESSAGE
1658             MRCWG  FILE,DATA                        12  04452  D 10891 01710 D L
1659             B      MONITR                            7  04464  J 02101
1660   NXTIAC    A      @1&,FILE                         11  04471  A 10489 10891
1661             BZ     *&8                               7  04482  J 04496 V
1662             B      NOACC                             7  04489  J 04417
1663             MRCWG  CEADDR,FILE                      12  04496  D 10342 10891 D L
1664   NO4XIT    B      MONITR                            7  04508  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION

1666
1667                ***  TEST ROUTINE DESCRIPTION  ***
1668                ***  TEST 7631 OP CODE DECODER  ***
1669          THIS ROUTINE TESTS THE OP CODE DECODERS ABIBILITY TO DECODE
1670         PROPERLY 7 OF THE 11 SPECIFIC OPERATIONS POSSIBLE.THE CODES TEST-
1671         ED ARE DONE IN A NO-OP MODE SO THAT NO OPERATIONS ARE PERFORMED,
1672         BECAUSEC PRIORITY IS REQUIRED FOR THE NO-OP THIS TEST IS NOT RUN
1673         IF PRIORITY IS NOT AVAILABLE.THE ERRORS INDICATED WHEN INVALID
1674         COMMAND IS SENSED ARE.
1675                      SEEK OP CODE 0     ERROR 07
1676                      SRO  OP CODE 1     ERROR 08
1677                      TRO  OP CODE 2     ERROR 09
1678                      WDC  OP CODE 3     ERROR 10
1679                      HAC  OP CODE 5     ERROR 11
1680                      TWA  OP CODE 6     ERROR 12
1681                      WFT OP CODE 7      ERROR 13
1682         THE REMAINING OP CODES ARE OPTIONAL FEATURES AND ONE SETS THE
1683         ACCESS INOP.THEY MAY BE TESTED LATER IN THE PROGRAM.
1684       N05       NOP                                              1  04515  N
1685                 DC      @05@              ROUTINE ID             2  04517
1686                 MRCG    CEADDR,FILE       LOAD FILE             12  04518  D 10342 10891 $
1687                 SC      1,FILE            SEEK DISK             10  04530  M %F0 10891 R
1688                 BAI     *&1                                      7  04540  R 04547 M
1689                 BEF1    *&8               CHECK FOR INVALID CD   7  04547  R 04561 8
1690                 B       *&7                                      7  04554  J 04567
1691                ***  SET ERROR 07 ON ***
1692                 SW      E7                SET ERROR IND ON       6  04561  , 01808
1693         A SEEK OP CAUSES EXT. COND-INVALID COMMAND-,CHECK OP DECODER
1694                 BCE     N05XIT,1264,      BRCH IF PRI NOT AVL   12  04567  B 04801 01264
1695                 MU      %F1,FILE,Q        SRO OP                10  04579  M %F1 10891 Q
1696                 BAI     *&1                                      7  04589  R 04596 M
1697                 BEF1    *&8               CHECK INVALID CODE     7  04596  R 04610 8
1698                 B       *&7                                      7  04603  J 04616
1699                ***  SET ERROR 08 ON ***
1700                 SW      E8                TURN ON ERROR IND      6  04610  , 01809
1701         A SINGLE RECORD OP CAUSES EXT COND-INVALID COMMAND-CHECK OP DECDR
1702                 MU      %F2,FILE,Q        TRO OP                10  04616  M %F2 10891 Q
```

```
PGLIN     LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION
1703                BAL    *&1                                        7   04626  R 04633 GM
1704                BEF1   *&8              CHECK INVALID COND         7   04633  R 04647 8
1705                B      *&7                                        7   04640  J 04653
1706                ***  SET ERROR 09 ON ***
1707                SW     E9               SET ERROR IND ON          6   04647  , 01810
1708          A TRACK WITHOUT ADDRESSES OP CAUSES EXT COND-INVALID COMMAND-
1709          CHECK OP DECODER
1710                MU     %F3,FILE,V       WDC OP                    10  04653  M %F3 10891 V
1711                BAL    *&1                                        7   04663  R 04670 GM
1712                BEF1   *&8              CHECK FOR INVALID CO      7   04670  R 04684 8
1713                B      *&7                                        7   04677  J 04690
1714                ***  SET ERROR 10 ON ***
1715                SW     E10              SET ERROR IND ON          6   04684  , 01811
1716          A WDC OP CAUSES EXT COND-INVALID COMMAND-CHECK OP DECODER
1717                MU     %F5,FILE,Q       HAO OP                    10  04690  M %F5 10891 Q
1718                BAL    *&1                                        7   04700  R 04707 GM
1719                BEF1   *&8              CHECK INVALID CODE        7   04707  R 04721 8
1720                B      *&7                                        7   04714  J 04727
1721                ***  SET ERROR 11 ON ***
1722                SW     E11              SET ERROR IND ON          6   04721  , 01812
1723          A HOME ADDRESS OP CAUSES EXT COND-INVALID COMMAND-CHECK OP DECOR
1724                MU     %F6,FILE,Q       TWA OP                    10  04727  M %F6 10891 Q
1725                BAL    *&1                                        7   04737  R 04744 GM
1726                BEF1   *&8              CHECK INVALID CODE        7   04744  R 04758 8
1727                B      *&7                                        7   04751  J 04764
1728                ***  SET ERROR 12 ON ***
1729                SW     E12              SET ERROR IND ON          6   04758  , 01813
1730          A TRACK WITH ADDRESS OP CAUSES EXT COND-INVALID COMMAND-CHECK
1731          OP DECODER
1732                MU     %F7,FILE,Q       FMT OP                    10  04764  M %F7 10891 Q
1733                BAL    *&1                                        7   04774  R 04781 GM
1734                BEF1   *&8              CHECK INVALID CODE        7   04781  R 04795 8
1735                B      *&7                                        7   04788  J 04801
1736                ***  SET ERROR 13 ON ***
1737                SW     E13              SET ERROR IND ON          6   04795  , 01814
1738          A WRITE FORMAT OP CAUSES EXT COND-INVALID COMMAND-CHECK OP DECOR
1739     NOSXIT     B      MONITR                                     7   04801  J 02101
```

```
PGLIN    LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
1741
1742                ***  TEST ROUTINE DESCRIPTION  ***
1743                *** TEST HI ORDER POSITIONS OF TRACK REGISTER  ***
1744                     ***  ACCESS POSITIONED AT CYLINDER 000 ***
1745          THIS TEST IS RUN ONLY WHEN MANUAL MODE HAS BEEN SELECTED.THE
1746          ACCESS IS FIRST POSITIONED MANUALLY TO CYL 000 BY THE CE,THEN A
1747          SEEK IS ISSUED TO EACH TRACK POSITION IN CYL 000.EACH SEEK IS
1748          FOLLOWED BY A SEEK TO THE SAME ADDRESS AND BUSY IS CHECKED.IF
1749          BUSY COMES ON THE ACCESS HAS MOVED INDICATING THE TRACK REGISTER
1750          IMPROPERLY DECODED THE ADDRESS.IF THIS HAPPENS ERROR 14 IS IND-
1751          ICATED AND THE FAILING ADDRESS IS STILL PRESENT AT THIS TIME.
1752     NO6        NOP                                                      1  04808  N
1753                DC       @06@                 ROUTINE ID               2  04810
1754                BCE      *&8,SPTAD1,1         BRCH IF IN MANUAL       12  04811  B 04830 01005 1
1755                B        NO8XIT                                        7  04823  J 05264
1756                B        TYP1                                          7  04830  J 01593
1757                DCW      @ACC TO CYL 000@,G                           14  04850
1758                H                             WAIT FOR ACTION          1  04852  .
1759                MLCA     @00000@,FILE&5       LOAD FILE ADDR          12  04853  D 10506 10896 I
1760                MLCA     CEADDR&1,FILE&1      RESET FILE ADDR         12  04865  D 10343 10892 I
1761     CYL000     SD       1,FILE               SEEK ACCESS             10  04877  M %F0 10891 R
1762                BAI      *&1                                           7  04887  R 04894 GM
1763                SD       1,FILE               SEEK ACCESS AGAIN       10  04894  M %F0 10891 R
1764                BAI      *&1                                           7  04904  R 04911 GM
1765                BCBI     ZEROCK               CHECK FOR BUSY           7  04911  R 04948 2
1766     NEXTRK     A        @1@,FILE&5           UPDATE TRACK ADDR       11  04918  A 10489 10896
1767                BCE      NO6XIT,FILE&4,4      CYLINDER COMPLETE       12  04929  B 04968 10895 4
1768                B        CYL000                                        7  04941  J 04877
1769                ***  SET ERROR 14 ON ***
1770     ZEROCK     SW       E14                  SET ERROR IND ON         6  04948  , 01815
1771          A SEEK TO ONE OF THE TRACKS IN CYL 000 CAUSED ACCESS TO MOVE.
1772                BAI      STACHK               BRCH TO STATUS CHK       7  04954  R 03086 GM
1773                B        NEXTRK                 RETURN HERE            7  04961  J 04918
1774     NO6XIT     B        MONITR                                        7  04968  J 02101
```

```
PGLIN    LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1776
1777                ***  TEST ROUTINE DESCRIPTION  ***
1778                ***  TEST HI ORDER POSITION OF TRACK REGISTER  ***
1779          THIS IS THE SAME AS RCUTINE NC6
1780          THIS IS THE SAME AS RCUTINE NC6 EXCEPT THAT THE ACCESS IS
1781        POSITICNED AT CYLINDER 110 AND SEEKS ARE ISSUED FOR EACH TRACK
1782        IN THE CYLINCER.IF THE ACCESS MOVES ERROR 15 IS INDICATED.FOR
1783        MORE DETAIL REFER TO RCUTINE NC6.
1784
1785     NO7        NCP                                               1  04975  N
1786                DC      @07@              ROUTINE ID              2  04977
1787                B       TYP1                                      7  04978  J 01593
1788                DCW     @ACC TO CYL 11C@,G                       14  04998
1789                H                         WAIT FCR ACTION         1  05000  .
1790                MLCA    @4400@,FILE&5     LOAD FILE              12  05001  D 10527 10896 T
1791                MLCA    CEADDR&1,FILE&1   RESET FILE ADDR        12  05013  D 10343 10892 T
1792     CYL110     SC      1,FILE            SEEK ACCESS            10  05025  M %F0 10891 R
1793                BA1     *&1                                       7  05035  R 05042 GM
1794                SC      1,FILE            SEEK ACCESS AGAIN      10  05042  M %F0 10891 R
1795                BA1     *&1                                       7  05052  R 05059 GM
1796                BCB1    ONETEN            BRCH BUSY              7  05059  R 05096 2
1797     UP1TRK     A       @1@,FILE&5        ADD 1 TO TKHD ADDR     11  05066  A 10489 10896
1798                BCE     NO7XIT,FILE&4,4   BRCH IF CYL COMP        12  05077  B 05116 10895 4
1799                B       CYL110                                    7  05089  J 05025
1800                ***  SET ERROR 15 ON ***
1801     ONETEN     SW      E15               SET ERROR IND ON        6  05096  , 01816
1802          A SEEK TO ONE OF THE TRACKS IN CYL 110 CAUSED ACCESS TO MOVE
1803                BA1     STACHK            GO TO ERROR ROUTINE       7  05102  R 03086 GM
1804                B       UP1TRK               RETURN HERE            7  05109  J 05066
1805     NO7XIT     B       MONITR                                    7  05116  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1807
1808                ***  TEST ROUTINE DESCRIPTION  ***
1809                ***  TEST HI ORDER POSITION OF TRACK REGISTER  ***
1810                     *** ACCESS POSITIONED AT CYL 194  ***
1811          THIS IS THE SAME AS ROUTINE NO5 & NO7 EXCEPT THAT THE ACCESS IS
1812          POSITIONED AT CYLINDER 194.ERROR 16 IS INDICATED IF THE ACCESS
1813          MOVES.REFER TO ROUTINE NO6 DESCRIPTION FOR MORE DETAIL.
1814     N08          NOP                                           1  05123  N
1815                  DC       @08@              ROUTINE ID         2  05125
1816                  B        TYP1                                 7  05126  J 01593
1817                  DCW      @ACC TO CYL 194@,G                  14  05146
1818                  H                          WAIT FOR ACTION    1  05148  .
1819                  MLCA     @7760@,FILE&5     LOAD FILE         12  05149  D 10531 10896 T
1820                  MLCA     CEADDR&1,FILE&1   RESET FILE ADDR    12  05161  D 10343 10892 T
1821     CYL194       SC       1,FILE            SEEK ACCESS       10  05173  M %F0 10891 R
                                                                                  G
1822                  BAI      *&1                                  7  05183  R 05190 M
1823                  SC       1,FILE            SEEK ACCESS AGAIN 10  05190  M %F0 10891 R
                                                                                  G
1824                  BAI      *&1                                  7  05200  R 05207 M
1825                  BCBI     ONE94             BRCH BUSY          7  05207  R 05244 2
1826     TRKUP1       A        @1@,FILE&5        UPDATE TRACK ADDR 11  05214  A 10489 10896
1827                  BCE      N08XIT,FILE&4,C   BRCH IF CYL COMPLETE 12  05225  B 05264 10895 0
1828                  B        CYL194                               7  05237  J 05173
1829                ***  SET ERROR 16 ON ***
1830     ONE94        SW       E16               SET ERROR IND ON    6  05244  , 01817
1831          A SEEK TO ONE OF THE TRACKS IN CYL 194 CAUSED ACCESS TO MOVE
                                                                                  G
1832                  BAI      STACHK            GO TO ERROR ROUTINE  7  05250  R 03086 M
1833                  B        TRKUP1               RETURN HERE       7  05257  J 05214
1834     N08XIT       B        MONITR                                 7  05264  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1836
1837                ***  TEST ROUTINE DESCRIPTION  ***
1838                ***  TEST WRITE FORMAT OPERATION ***
1839          USING AN OVERLAPPED WRITE FORMAT THIS TEST CHECKS FOR A HANG
1840          CONDITION IN THE 7631 DUE TO IMPROPER DECODING AND HANDLING OF
1841          THE WRITE FORMAT OPERATION.IF OVERLAP IN PROCESS REMAINS ON AFTER
1842          THE FORMAT OPERATION SHOULD HAVE BEEN COMPLETED THE SETTING OF
1843          THE E REG IS CHECKED AND ERROR 18 IS INDICATED.THE CONTENTS OF
1844          THE E REG ARE ALSO DISPLAYED WITH THE ERROR MESSAGE.THIS TEST IS
1845          BYPASSED IF OVERLAP IS NOT AVAILABLE.TEN PASSES ARE MADE
1846
1847          FORMAT ORGANIZATION
1848          GAP1--HA1 33 CHARS--GAP3
1849
1850          FORMAT USED
1851          4444443333333333333333333333333333334
1852
1853     NO9        NOP                                                    1  05271  N
1854                DC       @09@              ROUTINE ID                  2  05273
1855                MRDG     CEADDR,FILE       LOAD FILE ADDR             12  05274  D 10342 10891 S
1856                SC       1,FILE            SEEK ACCESS                10  05286  M %F0 10891 R
1857                BCBI     *-16                                          7  05296  R 05286 2
1858                BAI      *&1                                           7  05303  R 05310 M G
1859                B        TYP1              GO TYPE MESSAGE             7  05310  J 01593
1860                CCW      @ACC 0 TO CYL 250@,G                         16  05332
1861                H                          WAIT FOR ACTION             1  05334  .
1862                BCE      *&8,1264,1        BRCH IF PRIORITY            12  05335  B 05354 01264 1
1863                B        NO9XIT                                        7  05347  J 05538
1864     TST9       CS       DATAFD&99         CLEAR DATA FIELD            6  05354  / 10999
1865                S        LNGCNT                                        6  05360  S 10104
1866                MRCWG    TSTFMT,DATAFD     LOAD FORMAT                12  05366  D 10238 10900 D L
1867                MLCS     OVRLAP&X14,*&2    MOVE OVER LAP CODE         12  05378  D 10DP1 05391 3
1868                MW       @F7,FILE,W        WRITE FORMAT OVERLAP       10  05390  M @F7 10891 W
1869     DELAY2     A        @1@,LNGCNT        ADD 1 TO DELAY             11  05400  A 10489 10104
1870                BCL1     *&15              BRCH ON OVERLAP             7  05411  J 05432 1
1871                BAI      STACHK            GO TO STATUS CHECK          7  05418  R 03086 M G
1872                B        PASS9                                         7  05425  J 05513
```

```
PGLIN    LABEL    OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1873              BCE    *&8,LNGCNT-3,2     IS DELAY OVER         12  05432  B 05451 10101 2
1874              B      DELAY2                                    7  05444  J 05400
1875              SER    DATA&4             STORE E REG            7  05451  G 01714 E
1876              ***  SET ERROR 18 ON ***
1877              SW     E18,EXTRA&1        SET ERROR IND ON      11  05458  , 01819 03005
1878        A WRITE FORMAT OPERATION CAUSES 7631 TO HANG UP,THE CONTENTS OF
1879        THE E REG AFTER THE WRITE FORMAT ARE DISPLAYED IN THE ERROR MESS-
1880        AGE.IF THE E REG SETTING INDICATES ONLY THE ADDRESS WAS TRANS-
1881        FERRED,POSSIBLE FAILURE OF PREP READ-WRITE OR WRITE LINE.IF THE
1882        E REG SETTING INDICATES SOME PART OF THE DATA FIELD WAS TRANS-
1883        FERRED,POSSIBLE FAILURE IN THE REVOLUTION COUNTER.
1884              MRCWG  EREG,DATA&6        MOVE MESG             12  05469  D 09992 01716 D L
1885              MRCWG  BRCH2,1            MOVE BRCH INST        12  05481  D 10105 00001 D L
1886              DCW    a&Ga               RESET COMPUTER         1  05493
1887    HANG2     MRCWG  RESUME,1           RESTORE LOCATION 1    12  05494  D 02015 00001 D L
1888              B      NO9XIT                                    7  05506  J 05538
1889    PASS9     A      a1&,TENCNT         ADD 1 TO PASS COUNT   11  05513  A 10489 09991
1890              BZ     NO9XIT             BRCH ON ZERO RESULT    7  05524  J 05538 V
1891              B      TST9                                      7  05531  J 05354
1892    NO9XIT    B      MONITR                                    7  05538  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1894
1895                ***  TEST ROUTINE DESCRIPTION  ***
1896                *** FORMAT CHAR DECODER,PHASE SELECT CKTS  ***
1897          THIS TEST WRITES 8 BIT AND 6 BIT MODE FORMATS ON CYL 250.AFTER
1898          EACH WRITE FORMAT EXT COND,DATA CHECK,WRONG LENGTH RECORD,NO
1899          TRANSFER,AND THE NUMBER OF CHARACTERS TRANSFERRED ARE CHECKED.
1900          DIFFERENT COMBINATIONS OF THESE INDICATORS BEING ON CAUSE ERRORS
1901          TO BE INDICATED.THE FOLLOWING COMBINATIONS CAUSE THE FOLLOWING
1902          ERRORS.
1903              EXT COND                                  ERROR1
1904              EXT COND&WLR                              ERROR 22
1905              EXT COND&WLR&NO TRANS                     ERROR 23
1906              EXT COND&NOT ALL DATA TRANS               ERROR 20
1907              DATA CHECK                                ERROR 19
1908          TEN PASSES ARE MADE PROVIDED NO ERRORS OCCUR,WHEN AN ERROR DOES
1909          OCCURE THE TEST IS TERMINATED.
1910
1911          FORMAT ORGANIZATION
1912          GAP1--HA1 33 CHARS--GAP3
1913
1914          FORMAT FIELD 8 BIT MODE
1915          4444443333333333333333333333333333334
1916
1917          FORMAT FIELD 6 BIT MODE
1918          444444111111111111111111111111111111112
1919
1920     N10  NCP                                                1  05545  N
1921          DC     a1ca                                       2  05547
1922          CS     DATAFD&99          CLEAR DATA FIELD        6  05548  / 10399
1923     CNE3SW NCPWM                                           1  05554  N
1924          8      ONES                                       7  05555  J 05581
1925          MRCWG  TSTFMT,DATAFD      LOAD FORMAT WITH 3S     12 05562  D 10238 10900 L
1926          8      *&13                                       7  05574  J 05593
1927     CNE5  MRCWG  TSTFT6,DATAFD     LOAD FORMAT WITH 3S     12 05581  D 10279 10900 L
1928          MU     %F7,FILE,W         WRITE FORMAT            10 05593  H %F7 10091 W
1929          SBR    DATA&4             STORE B ADDR REG        7  05603  G 01714 D
1930          BAI    *&1                                        7  05610  R 05617 M
```

```
PGLIN    LABEL    OPCOD  OPERANC                                    CT  ADDRS  INSTRUCTION
1931              BEF1   CHKWLR          CHECK EXT COND             7  05617  R 05693 8
1932              BER1   SETE19          CHECK DATA CHECK           7  05624  R 05777 4
1933              A      @1@,TENCNT       ADD 1 TO PASS CNT         11  05631  A 10489 09991
1934              BZ     N10XIT           BRCH ON ZERO RESULT        7  05642  J 05783 V
1935     THREE1   NCPWM                                             1  05649  N
1936              B      *&19                                       7  05650  J 05675
1937              SW     THREE1&1,ONE3SW&1 TURN ON SWITCHES FOR    11  05657  , 05650 05555
1938              B      ONE3SW               6 BIT MODE FORMAT     7  05668  J 05554
1939              CW     THREE1&1,ONE3SW&1 TURN OFF SWITCHES       11  05675  ¤ 05650 05555
1940              B      ONE3SW                                     7  05686  J 05554
1941     CHKWLR   BWL1   CHKNOT           CHECK WRONG L IN          7  05693  R 05744 -
1942              C      DATA&4,CON1       WAS DATA TRANSFERED      11  05700  C 01714 10117
1943              BE     *&14              IF SO                    7  05711  J 05731 S
1944                    *** SET ERROR 20 ON ***
1945              SW     E20               SET ERROR IND ON         6  05718  , 01821
1946       WRITE FORMAT CAUSES EXT COND AND NOT ALL THE DATA IS TRANSFERRED,
1947       POSSIBLE FAILURE IN PHASE SELECT CKTS ASSCCIATED WITH WRITE.
1948              B      N1CXIT                                     7  05724  J 05783
1949                    *** SET ERROR 21 ON ***
1950              SW     E21               SET ERROR IND ON         6  05731  , 01822
1951       WRITE FORMAT CAUSES EXT COND WITH ALL DATA BEING TRANSFERRED
1952       POSSIBLE CAUSE,DISCONNECT NOT RECOGNIZED.
1953              B      N1CXIT                                     7  05737  J 05783
1954     CHKNOT   BNT1   *&14               CHECK NO TRANSFER        7  05744  R 05764 S 8
1955                    *** SET ERROR 22 ON ***
1956              SW     E22               SET ERROR IND ON         6  05751  , 01823
1957       WRITE FORMAT CAUSES EXT COND,&WLR,ALL DATA WAS TRANSFERRED,
1958       POSSIBLE 1301 CKT CHECK
1959              B      N1CXIT                                     7  05757  J 05783
1960                    *** SET ERROR 23 ON ***
1961              SW     E23               SET ERROR IND ON         6  05764  , 01824
1962       WRITE FORMAT CAUSES EXT COND,WLR,& NO TRANSFER,POSSIBLE FAILURE
1963       OF CE-HAC SWITCH ON OR THE ASSCCIATED CKTS.
1964              B      N1CXIT                                     7  05770  J 05783
1965                    *** SET ERROR 19 ON  ***
1966     SETE19   SW     E19               SET ERROR IND ON         6  05777  , 01820
1967       WRITE FORMAT CAUSES DATA CHECK, POSSIBLE FAILURE OF FORMAT
```

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PGLIN    LABEL    OPCOD  OPERAND                    CT  ADDRS  INSTRUCTION

1968              CHARACTER DECODER.
1969     N10XIT   B      MONITR                      7  05783  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1971
1972                ***  TEST ROUTINE DESCRIPTION  ***
1973                ***  TEST WRITE DISK OPERATION  ***
1974          THIS CHECKS THE OPERATION OF GAP DETECTORS,WRITE FORMAT CKTS,
1975          PHASE SELECTION ASSOCIATED WITH READ,AND DECODING AND OPERATING
1976          A WRITE DISK CHECK.USING THE FORMAT WRITTEN IN ROUTINE N10 AN
1977          OVERLAPPED WDC IS ISSUED AND IF OVERLAP DOES NOT DROP AFTER A
1978          GIVEN PERIOD OF TIME ERROR 25 IS INDICATED.FOLLOWING THIS A NON-
1979          OVERLAPPED WDC IS ISSUED AND EXT COND AND WLR ARE CHECKED.EXT
1980          COND CAUSES ERROR 26,EXT COND AND WLR CAUSES ERROR 26.TEN PASSES
1981          ARE MADE PROVIDED NO ERRORS OCCURE,AN ERROR CAUSES THE TEST TO
1982          TERMINATE.THE OVERLAP PORTION IS BYPASSED IF OVERLAP IS NOT
1983          AVAILABLE.
1984
1985          FORMAT ORGANIZATION
1986          GAP1--HA1 33 CHARS--GAP3
1987
1988          DATA FIELD USED
1989          444111111111111111111111111111111112
1990
1991      N11       NOP                                                    1  05790  N
1992                DC      @11@          ROUTINE ID                       2  05792
1993                S       LNGCNT                                         6  05793  S 10104
1994                MRCWG   TSTFT6,DATAFD LOAD FORMAT                     12  05799  D 10279 10900 D L
1995                BCE     *&8,1264,1    BRCH IF OVERLAP AVAL             12  05811  B 05830 01264 1
1996                B       WDCNOV                                         7  05823  J 05965
1997                MLCS    OVRLAP&X14,*&2 MOVE OVER LAP CODE              12  05830  D 10DP1 05843 3
1998                MU      @F3,FILE,W    OVERLAPPED WDC                   10  05842  M @F3 10891 W
1999      DELAY3    A       @1@,LNGCNT    ADD 1 TO DELAY COUNT             11  05852  A 10489 10104
2000                BCL1    *&15                                           7  05863  J 05884 1 G
2001                BAI     STACHK        GO TO STATUS CHECK               7  05870  R 03086 M
2002                B       WDCNOV                                         7  05877  J 05965
2003                BCE     *&8,LNGCNT-3,2 IS DELAY COMPLETE               12  05884  B 05903 10101 2
2004                B       DELAY3                                         7  05896  J 05852
2005                SER     DATA&4        STORE E REG                      7  05903  G 01714 E
2006                MRCWG   EREG,DATA&7   MOVE MESSAGE                    12  05910  D 09992 01717 D L
2007                MRCWG   BRCH3,1       MOVE BRCH INST                  12  05922  D 10118 00001 C L
2008                ***  SET ERROR 25 ON  ***
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2009                SW     E25,EXTRA&1        SET ERROR IND ON      11  05934  , 01826 03005
2010          WRITE DISK CHECK CAUSES 7631 TO HANG UP,CPU STAYS IN OVERLAP.
2011                DCW    @MG@                                      1  05945
2012      HANG3     MRCWG  RESUME,1           RESTORE LOC 1         12  05946  D 02015 00001 D
2013                B      N11XIT                                    7  05958  J 06040
2014      WDCNOV    WDC    1,FILE             WDC NON-OVERLAP       10  05965  M %F3 10891 W
2015                BAI    *&1                                       7  05975  R 05982 G
2016                BEFI   WLRCHK             CHECK FOR EXT COND     7  05982  R 06014 8
2017                A      @1@,TENCNT         ADD 1 TO PASS COUNT   11  05989  A 10489 09991
2018                BZ     N11XIT             BRCH ON ZERO RESULT    7  06000  J 06040 V
2019                B      N11                                       7  06007  J 05790
2020      WLRCHK    BWLI   *&14               CHECK WLR              7  06014  R 06034 -
2021                ***  SET ERROR 26 ON  ***
2022                SW     E26                SET ERROR IND ON       6  06021  , 01827
2023          WRITE DISK CHECK CAUSES EXT COND,POSSIBLE FAILURE OF GAP DETECTOR
2024                B      N11XIT                                    7  06027  J 06040
2025                ***  SET ERROR 27 ON  ***
2026                SW     E27                SET ERROR IND ON       6  06034  , 01828
2027          WRITE DISK CHECK CAUSES EXT COND AND WLR,POSSIBLE FAILURE OF
2028          WRITE FORMAT CKTS,CR PHASE SELECT CKTS ASSOCIATED WITH READ.
2029      N11XIT    B      MONITR                                    7  06040  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2031
2032                ***  TEST ROUTINE DESCRIPTION  ***
2033                ***  TEST FORMAT CHARACTER DECODER  ***
2034          USING A NORMAL FORMAT FIELD,6 BIT MODE,WITH ONE ILLEGAL CHARACTR
2035         . INSERTED,A WRITE FORMAT IS ISSUED AND  DATA CHECK IS CHECKED.IF
2036          DATA CHECK IS OFF,NO ILLEGAL CHARACTER DETECTED,ERROR 28 IS IND-
2037          ICATED.IF DATA CHECK IS ON,THE NUMBER OF CHARACTERS TRANSFERRED
2038          IS CHECKED,AND IF IT  DOES NOT REFLECT THE POSITION OF THE
2039          ILLEGAL CHARACTER IN THE DATA FIELD ERROR 29 IS INDICATED.A PASS
2040          IS MADE FOR EVERY POSSIBLE ILLEGAL CHARACTER EXCEPT IF AN ERROR
2041          OCCURES THE TEST IS TERMINATED.
2042
2043          FORMAT ORGANIZATION
2044          GAP1--HA1--GAP2--HA2 6 CHARS--X GAP--REC ADDR 10 CHARS--Y GAP--
2045          RECORD AREA 6 CHARS--GAP3
2046
2047          FORMAT DATA FIELD USED,6 BIT MODE -ILLEGAL CHAR IN POSITION 26-
2048          444444333333333333433333333333341X111111122222222222222211111111
2049          1111121111111111111121111111112
2050
2051     N12  NCP                                                           1  06047  N
2052          CC        @12@                 ROUTINE ID                    2  06049
2053          CS        DATAFD&99            CLEAR DATA FIELD              6  06050  / 10999
2054          MRCWG     HA1-32,DATAFD        LOAD FORMAT                  12  06056  D 10142 10900 DL
2055          ZA        @0C00@,X10           LOAD IX 10                   11  06068  M 10506 00074 M
2056     SETBAC MLCS    ALLCHR&X10,DATAFD&34      SET ILLEGAL CODE        12  06079  D 10.K6 10934 3
2057          MU        %F7,FILE,W           WRITE FORMAT                 10  06091  M %F7 10891 W
2058          SBR       DATA&4               STORE BAR                     7  06101  G 01714 BG
2059          BAL       *&1                                                7  06108  R 06115 M
2060          MRCWG     BREG,DATA&7          MOVE MESG                    12  06115  D 09998 01717 DL
2061          BER1      CHKLOC               CHECK DATA CHECK              7  06127  R 06152 4
2062                ***  SET ERROR 28 ON  ***
2063          SW        E28,EXTRA&1          SET ERROR IND ON              11  06134  , 01829 03005
2064          WRITE FORMAT USING AN ILLEGAL CHARACTER IN DATA FIELD DOES NOT
2065          CAUSE DATA CHECK.POSSIBLE FAILURE OF FORMAT CHAR DECODER.FAILING
2066          CHARACTER IS STILL PRESENT IN DATA FIELD AT TIME ERROR IS IND.
2067               B         N12XIT                                          7  06145  J 06218
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2068      CHKLOC    C      DATA&4,CON2          WAS CORRECT CHAR    11  06152  C 01714 10141
2069                BE     GETCHR                 DETECTED AS ILLEGL 7  06163  J 06188 S
2070                ***  SET ERROR 29 ON ***
2071                SW     E29,EXTRA&1          SET ERROR IND ON    11  06170  , 01830 03005
2072          WRITE FORMAT USING AN ILLEGAL CHARACTER IN DATA FIELD,THE WRONG
2073          CHARACTER CAUSES DATA CHECK.B REG CONTENTS EQUALS 2 CHARACTERS
2074          ABOVE ONE THAT CAUSED DATA CHECK.POSSIBLE FAILURE OF FORMAT CHAR
2075          DECODER,DECODING LEGAL CHARACTER AS ILLEGAL.
2076                B      N12XIT                                    7  06181  J 06218
2077      GETCHR    A      a1&,X10              UP DATE IX 10       11  06188  A 10489 00074
2078                BCE    N12XIT,X10-1,5       HAVE ALL ILLEGAL    12  06199  B 06218 00073 5
2079                B      SETBAD                 CHARS BEEN CHKD   7  06211  J 06079
2080      N12XIT    B      MONITR                                   7  06218  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2082
2083                ***  TEST ROUTINE DESCRIPTION  ***
2084                ***  TEST GAP DETECTORS  ***
2085          A NORMAL 6 BIT MODE FORMAT IS WRITTEN,THIS IS FOLLOWED BY FOUR
2086          WRITE DISK CHECKS IN WHICH THE GAPS IN DATA FIELD ARE VARIED AND
2087          EXTERNAL CONDITION IS CHECKED,IF IT IS NOT ON AN ERROR IS INDI-
2088          CATED.
2089              1ST WDC  LENGTHEN LONG X GAP          NO EXT COND ERROR 30
2090              2ND WDC  SHORTEN LONG X GAP           NO EXT COND ERROR 31
2091              3RD WDC  LENGTHEN SHORT GAP 2         NO EXT COND ERROR 32
2092              4TH WDC  SHORTEN SHORT GAP 2          NO EXT COND ERROR 33
2093          AFTER THESE A WDC WITH ALL GAPS NORMAL CHECKS TO INSURE FORMAT
2094          WAS RECORDED CORRECTLY.TEN PASSES ARE MADE THROUGH THE ROUTINE.
2095
2096          FORMAT ORGANIZATION
2097          GAP1--HA1--GAP2--HA2 6 CHARS--X GAP--REC ADDR 10 CHARS--Y GAP--
2098          RECORD AREA 6 CHARS--GAP3
2099
2100          FORMAT DATA FIELD USED
2101          444444333333333333433333333333341111111112222222222222222211111111
2102          1111121111111111111121111111112
2103
2104     N13  NCP                                                           1  06225  N
2105          DC       @13@              ROUTINE ID                      2  06227
2106          S        TENCNT                                            6  06228  S 09991
2107     TST13 CS      DATAFD&99         CLEAR DATA FIELD                6  06234  / 10999
2108          MRCWG    HA1-32,DATAFD     LOAD FORMAT                     12 06240  D 10142 10900 D
                                                                                                 L
2109          MU       %F7,FILE,W        WRITE FORMAT                    10 06252  M %F7 10891 W
                                                                                          G
2110          BAI      *&1                                               7  06262  R 06269 M
2111          MLCS     @2@,DATAFD&57     LENGTHEN LONG GAP               12 06269  D 10502 10957 3
2112          WDC      1,FILE            WRITE DISK CHECK                10 06281  M %F3 10891 W
                                                                                          G
2113          BAI      *&1                                               7  06291  R 06298 M
2114          BEFI     *&7               CHECK EXTERNAL COND             7  06298  R 06311 8
2115               ***  SET ERROR 30 ***
2116          SW       E3C               SET ERROR IND ON                6  06305  , 01831
2117          WRITE DISK CHECK OF FORMAT WITH X GAP INCREASED BY 1 CHAR DOES
2118          NOT CAUSE EXT COND,POSSIBLE FAILURE OF GAP DETECTOR
2119          MLCA     @11@,DATAFD&57    SHORTEN LONG GAP                12 06311  D 10533 10957 I
```

```
PGLIN    LABEL    OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

2120              WCC    1,FILE              WRIT DISK CHECK      10  06323  M %F3 10891 W
2121              BAL    *&1                                       7  06333  R 06340 M
                                                                              G
2122              BEF1   *&7                 CHECK EXT COND        7  06340  R 06353 8
2123             *** SET ERROR 31 ON ***
2124              SW     E31                 SET ERROR IND ON      6  06347  , 01832
2125       WRITE DISK CHECK OF FORMAT WITH X GAP SHORTENED BY 1 CHAR DOES
2126       NOT TURN ON EXT COND.POSSIBLE FAILURE OF  GAP DETECTOR
2127              MLCA   @21@,DATAFD&57      RESTORE GAP          12  06353  D 10535 10957 T
2128              MLCA   @4&,DATAFD&33       LENGTHEN SHORT GAP   12  06365  D 10536 10933 T
2129              WCC    1,FILE              WRITE DISK CHECK     10  06377  M %F3 10891 W
2130              BAL    *&1                                       7  06387  R 06394 M
                                                                              G
2131              BEF1   *&7                 CHECK FOR EXT COND    7  06394  R 06407 8
2132             *** SET ERROR 32 ON ***
2133              SW     E32                 SET ERROR IND ON      6  06401  , 01833
2134       WRITE DISK CHECK OF FORMAT WITH GAP2 INCREASED BY 1 CHAR DOES NOT
2135       CAUSE EXT COND,POSSIBLE FAILURE OF GAP DETECTORS
2136              MLCA   @11@,DATAFD&33      SHORTEN SHORT GAP    12  06407  D 10533 10933 T
2137              WCC    1,FILE              WRITE DISK CHECK     10  06419  M %F3 10891 W
2138              BAL    *&1                                       7  06429  R 06436 M
                                                                              G
2139              BEF1   *&7                 CHECK EXT COND        7  06436  R 06449 8
2140             *** SET ERROR 33 ON ***
2141              SW     E33                 SET ERROR IND ON      6  06443  , 01834
2142       WRITE DISK CHECK OF FORMAT WITH GAP2 SHORTENED BY 1 CHAR DOES NOT
2143       CAUSE EXT COND,POSSIBLE FAILURE OF GAP DETECTORS
2144              MLCA   @4@,DATAFD&32       RESTORE SHORT GAP    12  06449  D 10536 10932 T
2145              WCC    1,FILE              WRITE DISK CHECK     10  06461  M %F3 10891 W
2146              BAL    STACHK              GO CHECK STATUS IND   7  06471  R 03086 M
                                                                              G
2147              A      @1@,TENCNT            RETURN HERE        11  06478  A 10489 09991
2148              BZ     N13XIT              TEN PASSES AND BRCH   7  06489  J 06503 V
2149              B      TST13                                     7  06496  J 06234
2150     N13XIT   B      MONITR                                    7  06503  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2152
2153                ***  TEST ROUTINE DESCRIPTION  ***
2154                ***  TEST HAO OPERATION  ***
2155          THE PROGRAM PERFORMS AN OVERLAPPED WRITE HAO OPERATION AND THEN
2156          DELAYS LONG ENOUGH FOR THE OPERATION TO BE COMPLETED.AT THE END
2157          OF THE DELAY IF OVERLAP IS STILL IN PROCESS ERROR 35 IS INDICATED
2158          THE CONTENTS OF THE E REG AFTER THE WRITE HAO IS ALSO DISPLAYED
2159          WITH THE ERROR MESSAGE.TEN PASS ARE MADE IF NO ERRORS OCCURE.
2160
2161          FORMAT REQUIRED
2162          SAME AS FORMAT WRITTEN BY ROUTINE N13
2163
2164          DATA FIELD ORGANIZATION
2165          HA1 5 CHARS--HA2 2 CHARS--REC ADDR 6 CHARS--RECORD 2 CHARS
2166
2167          DATA FIELD ORGANIZATION
2168          9#208881234564-
2169
2170     N14  NOP                                                           1  06510  N
2171          DC        @14@              ROUTINE ID                        2  06512
2172          BCE       *&8,1263,1        BRCH IF OVERLAP                  12  06513  B 06532 01263 1
2173          B         N14XIT                                              7  06525  J 06764
2174          CS        DATAFD&99         CLEAR WRITE FLD                   6  06532  / 10999
2175          MRCG      CEADDR,FILE       LOAD FILE ADDR                   12  06538  D 10342 10891 $
2176          SW        FILE&2                                              6  06550  , 10893
2177          MLCA      FILE&5,DATAFD&3   LOAD                             12  06556  D 10896 10903 1
2178          MLCA      @888@,DATAFD&6        DATA                         12  06568  D 10539 10906 I
2179          MRCWG     ALLBIT,DATAFD&7           FIELD                    12  06580  D 10320 10907 L
2180          S         TENCNT                                              6  06592  S 09991
2181          MLCS      OVRLAP&X14,*&2    MOVE OVER LAP CODE               12  06598  D 10DP1 06611 3
2182     TST14  MW      @F5,FILE,W        WRITE HAO OVERLAP                10  06610  M @F5 10891 W
2183          S         LNGCNT                                              6  06620  S 10104
2184     DELAY4 A       @1@,LNGCNT        ADD 1 TO DELAY CNT               11  06626  A 10489 10104
2185          BCL1      *&15              BRCH OVERLAP IN PRO               7  06637  J 06658 1
2186          BAL       STACHK            GO TO STATUS CHECK                7  06644  R 03086 G M
2187          B         PASS14                                              7  06651  J 06739
2188          BCE       *&8,LNGCNT-3,2    IS DELAY COMPLETE                12  06658  B 06677 10101 2
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2189                B      DELAY4                                    7  06670  J 06626
2190                ***  SET ERROR 35 ON  ***
2191                SW     E35,EXTRA&1          SET ERROR IND ON    11  06677  , 01836 03005
2192          WRITE HAD OVERLAPPED CAUSES 7631 TO HANG UP
2193                SER    DATA&4               STORE E REG          7  06688  G 01714 E
2194                MRCWG  EREG,DATA&7          MOVE MESSAGE        12  06695  D 09992 01717 D L
2195                MRCWG  BRCH4,1              MOVE BRCH INST      12  06707  D 10329 00001 D L
2196                DCW    aMa                                       1  06719
2197      HANG4     MRCWG  RESUME,1             RESTORE LOC 1       12  06720  D 02015 00001 D L
2198                B      N14XIT                                    7  06732  J 06764
2199      PASS14    A      a1a,TENCNT           ADD 1 TO PASS COUNT  11  06739  A 10489 09991
2200                BZ     N14XIT               BRCH ON 10TH PASS    7  06750  J 06764 V
2201                B      TST14                                     7  06757  J 06610
2202      N14XIT    B      MONITR                                    7  06764  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2204
2205                ***  TEST ROUTINE DESCRIPTION  ***
2206                ***  TEST DATA HANDLING CAPABILITIES  ***
2207          THIS ROUTINE USES THE HAO OPERATION TO WRITE AND READ EVERY
2208        ONE OF THE 64 POSSIBLE CHARACTERS.SINCE THE CE-HAC SWITCH IS ON
2209        AT THIS TIME THE HOME ADDRESSES FOR 9#20-9#59 ARE ALSO WRITTEN.
2210        THE RECORD OF 2 CHARACTERS IS LOADED WITH ONE OF THE 64 1410
2211        CHARACTERS AND A WRITE HAO OP IS PERFORMED FOR EVERY TRACK IN
2212        CYLINDER 253.IF THE ENTIRE DATA FIELD IS NOT TRANSFERRED ON THE
2213        WRITE OP ERROR 36 IS INDICATED.AFTER EVERY TRACK HAS BEEN WRITTEN
2214        ON P READ HAO OF EVERY TRACK IS PERFORMED.EVERY READ IS FOLLOWED
2215        BY A CHECK OF EXT.COND,DATA CHECK,AND COMPARE IN MEMORY OF THE
2216        DATA FIELD READ TO THAT WRITTEN.THE FOLLOWING ERRORS CAN BE
2217        INDICATED
2218                EXT COND ON                          ERROR 39
2219                DATA CHECK ON                        ERROR 40
2220                RECORD READ DOES NOT EQUAL RECORD WRITTEN    ERROR 37
2221                HOME ADDRESS 1 DOES NOT EQUAL HOME ADDRESS 1 WRITTEN
2222                                                     ERROR 38
2223        THE ROUTINE IS REPEATED FOR ALL 64 CHARACTERS UNLESS AN ERROR
2224        OCCURES IN WHICH CASE THE TEST IS TERMINATED.
2225
2226        FORMAT REQUIRED
2227        SAME AS FORMAT WRITTEN BY ROUTINE N13
2228
2229        DATA FIELD ORGANIZATION
2230        HA1 5CHARS--HA2 2 CHARS--REC ADDR 6 CHARS--RECORD 2 CHARS
2231
2232        DATA FIELD USED-HA1 UPDATED 20-59--RECORD UPDATED FOR EVERY CHAR
2233        9#20888123456XX
2234      N15       NOP                                                  1  06771  N
2235                OC      @15@                                         2  06773
2236                ZA      @0C000@,X10          LOAD IX 10             11  06774  A 10506 00074
2237      TST15     MRCG    CEADDR,FILE          RESET FILE ADDR        12  06785  D 10342 10891 &
2238                CS      DATAFD@99            CLEAR DATA FIELD        6  06797  / 10999
2239                SW      FILE@4                                       6  06803  , 10895
2240                MRCWG   ALLBIT,DATAFD@7      LOAD DATA FIELD        12  06809  D 10320 10907 L
```

```
                    N15
PGLIN    LABEL      OPCOD  OPERAND
2241                MLCS   ALLCHR&X10,DATAFD&14  WITH REC ADDR AND
2242                MLCS   ALLCHR&X10            TEST CHAR
2243     WRTHAD     MRCG   FILE&2,DATAFD         LOAD ADDRESS
2244                MLCA   @888@,DATAFD&6                IN FIELD
2245                MU     %F5,FILE,W            WRITE HAD
2246                SBR    DATA&4                STORE B ADDR REG
2247                BAI    STACHK                BRCH ON ANY IND
2248                C      DATA&4,CON3             RETURN HERE
2249                BE     *&14                  WAS ALL DATA TRANS
2250                ***  SET ERROR 36 ON ***
2251                SW     E36                   SET ERROR IND ON
2252       WRITE HAD CP THE ENTIRE DATA FIELD WAS NOT TRANSFERRED,POSSIBLE
2253       FAILURE OF FORMAT RECOGNITION CKTS.
2254                B      N15XIT
2255                A      @1@,FILE&5            ADD 1 TO TKHD ADR
2256                BCE    *&8,FILE&4,6          BRCH IF CYL COMPLETE
2257                B      WRTHAD
2258                MLCS   DATAFD&14,DATAFD&31 SAVE TEST CHAR
2259                MLCS
2260                MRCG   CEADDR,FILE           RESET FILE ADDR
2261                CS     DATAFD&14
2262     RDHAD      MU     %F5,FILE,R            READ HAD
2263                BEFI   SETE39                CHECK EXTERNAL COND
2264                BERI   SETE40                CHECK DATA CHECK
2265                BAI    STACHK                GO CHECK STATUS ERR
2266                SW     DATAFD&30
2267                C      DATAFD&14,DATAFD&31 CHECK DATA READ
2268                BE     *&8                   IF IT IS GOOD BRCH
2269                B      SETE37
2270                CW     FILE&4
2271                SW     FILE&2,DATAFD
2272                C      DATAFD&5,FILE&7       CHECK ADDRESS READ
2273                BE     RDNXTK                BRCH IF ADDR CORRECT
2274                ***  SET ERROR 38 ON ***
2275                SW     E38                   SET ERROR IND ON
2276       HOME ADDR 1 WRITTEN BY HAD OP DOES NOT COMPARE TO HOME ADDRESS
2277       READ BACK.ADDRESS READ BACK IS IN DATA FIELD AT TIME ERROR IS IND
2278       POSSIBLE FAILURE IN THE LO-ORDER POSITIONS OF THE TRACK REGISTER.
```

```
                    DC03          PAGE 194
CT   ADDRS   INSTRUCTION
12   06821   D 10%K6 10914 3
 6   06833   D 10%K6
12   06839   D 10893 10900 $
12   06851   D 10539 10906 I
10   06863   M %F5 10891 W
 7   06873   G 01714 B
 7   06880   R 03086 GM
11   06887   C 01714 10341
 7   06898   J 06918 S

 6   06905   , 01837

 7   06911   J 07193
11   06918   A 10489 10896
12   06929   B 06948 10895 6
 7   06941   J 06839
12   06948   D 10914 10931 3
 1   06960   D
12   06961   D 10342 10891 $
 6   06973   / 10914
10   06979   M %F5 10891 R
 7   06989   R 07174 8
 7   06996   R 07187 4
 7   07003   R 03086 GM
 6   07010   , 10930
11   07016   C 10914 10931
 7   07027   J 07041 S
 7   07034   J 07089
 6   07041   ¤ 10895
11   07047   , 10893 10900
11   07058   C 10905 10898
 7   07069   J 07102 S

 6   07076   , 01839
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2279                B      N15XIT                                    7  07082  J 07193
2280                ***  SET ERROR 37 ON  ***
2281      SETE37    SW     E37                SET ERROR IND ON       6  07089  , 01838
2282        DATA RECORD READ BACK DOES NOT COMPARE TO DATA RECORD WRITTEN,
2283        POSSIBLE FAILURE IN READ-WRITE PATHS.DATA RECORD READ IS IN DATA
2284        FIELD WHEN ERROR IS INDICATED.
2285                B      N15XIT                                    7  07095  J 07193
2286      RDNXTK    SW     FILE&4                                    6  07102  , 10895
2287                A      @1@,FILE&5         ADD 1 TO TKHD ADDR    11  07108  A 10489 10896
2288                BCE    *&8,FILE&4,6       BRCH IF CYL COMPLETE  12  07119  B 07138 10895 6
2289                B      RDHAD                                     7  07131  J 06979
2290                A      @1@,X1C            ADD 1 TO CHAR COUNT   11  07138  A 10489 00074
2291                C      X1C,@6C@           ALL CHARACTERS CHKD   11  07149  C 00074 10519
2292                BE     N15XIT              IF SO BRCH            7  07160  J 07193 S
2293                B      TST15                                     7  07167  J 06785
2294                ***  SET ERROR 39 ON ***
2295      SETE39    SW     E39                SET ERROR IND ON       6  07174  , 01840
2296        READ HAD CAUSES EXT COND,POSSIBLE FAILURE OF PHASE SELECT CKTS
2297        ASSOCIATED WITH READ
2298                B      N15XIT                                    7  07180  J 07193
2299                ***  SET ERROR 40 ON  ***
2300      SETE40    SW     E4C                SET ERROR IND ON       6  07187  , 01841
2301        READ HAD CAUSES DATA CHECK,POSSIBLE FAILURE OF PHASE SELECT CKTS
2302        OR READ DATA PATHS.
2303      N15XIT    B      MONITR                                    7  07193  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

2305
2306                ***  TEST ROUTINE DESCRIPTION  ***
2307                ***  TEST FLAGGING CAPABILITIES  ***
2308          THE ROUTINE REQUESTS THE NUMBER OF SPARE HEADS AVAILABLE FOR
2309          FLAGGING.USING THIS INFO THE PROGRAM WRITES A FLAG CHARACTER FOR
2310          HEAD AVAILABLE ON TRACKS 9#20-9#25 OR LESS,AND WRITES HOME ADDR-
2311          ESSES ON THE AVAILABLE ALTERNATES ALONG WITH A CODE CHARACTER.
2312          A REQUEST IS THEN MADE TO TURN OFF THE CE-HAD SWITCH,AND A READ
2313          HAD IS ISSUED TO AN UN-FLAGGED TRACK.IF THIS RESULTS IN EXT COND,
2314          ERROR 41 IS INDICATED.THE TRACK ADDRESS IS RESET TO ZERO AND AN-
2315          OTHER READ HAD IS ISSUED IF THIS DOES NOT CAUSE EXT COND ERROR 42
2316          IS INDICATED.
2317
2318          FORMAT REQUIRED
2319          SAME AS WRITTEN IN ROUTINE N13
2320
2321          DATA FIELD ORGANIZATION
2322          HA1 4 CHARS--FLAG CHAR--AA2 2 CHARS--CODE CHARACTER
2323
2324          DATA FIELD USED-HA1 UPDATED UP TO 9#25-
2325          9#20X88A
2326
2327     N16       NOP                                                1  07200  N
2328               DC        @16@                                     2  07202
2329               ZA        @00000@,X10          LOAD IX 10          11  07203  Q M 10506 00074
2330               B         TYP2                                     7  07214  J 01607
2331               DCW       @# OF SPARE HEADS@,G                     16  07236
2332     AVALTR    DCW       @ &,G                                    1  07238
2333               MLNS      AVALTR,CKALT1&11     MOVE NO. OF HEADS   12  07240  D 07238 07398 1
2334               MLNS      AVALTR,CKALT2&11     MOVE NO. OF HEADS   12  07252  D 07238 07515 1
2335               MLNS      AVALTR,CKALT3&11     MOVE NO. OF HEADS   12  07264  D 07238 07731 1
2336               MRCWG     CEADDR,FILE          LOAD FILE ADDR      12  07276  D 10342 10891 D L
2337               CS        DATAFD&99            CLEAR DATA FIELD     6  07288  / 10999
2338     TST16     MRCG      FILE&2,DATAFD        LOAD ADDR INTO FIELD 12  07294  D 10893 10900 $
2339               MLCWS     @M@,DATAFD&8                              12  07306  D 10487 10908 7
2340               MLCA      @888A@,DATAFD&7      LOAD CODE CHAR&HA2   12  07318  D 10543 10907 I
2341               MLCS      FLAGS&X10,FILE&6                          12  07330  D 10LN1 10897 3
```

```
PGLIN     LABEL     OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
2342                MU     %F5,FILE,W       WRITE HAD       10  07342  M %F5 10891 W
2343                BAL    *&1                              7  07352  R 07359 M
2344                A      @1@,X1C          ADD 1 TO IX 10  11  07359  A 10489 00074
2345                SW     FILE&4                           6  07370  , 10895
2346                A      @1@,FILE&5       ADD 1 TO FILE ADDR  11  07376  A 10489 10896
2347      CKALT1    BCE    *&8,X1C,F        ALL ALTERNATES USED  12  07387  B 07406 00074 F
2348                B      TST16                            7  07399  J 07294
2349                MRCG   CEADDR,FILE      RESET FILE ADDR.  12  07406  D 10342 10891 $
2350                ZA     @00003,X10       RELOAD IX 10    11  07418  M 10506 00074
2351      TST165    MRCG   FILE&2,DATAFD    LOAD ADDR INTO FLD  12  07429  D 10893 10900 $
2352                MLCA   @N@,DATAFD&7     LOAD CODE CHAR  12  07441  D 10484 10907 T
2353                MLCS   FLAGS&X10,DATAFD&4  MOVE FLAG CHAR  12  07453  D 10LN1 10904 3
2354                MU     %F5,FILE,W       WRITE HAD       10  07465  M %F5 10891 W
2355                BAL    *&1                              7  07475  R 07482 M
2356                A      @1@,X10          ADD 1 TO IX 10  11  07482  A 10489 00074
2357                A      @1@,FILE&5       ADD 1 TO ADDR   11  07493  A 10489 10896
2358      CKALT2    BCE    *&8,X1C,F        ALL FLAGS WRITTEN  12  07504  B 07523 00074 F
2359                B      TST165                           7  07516  J 07429
2360                B      TYP1                             7  07523  J 01593
2361                CCW    @CE-HAD OFF@,G                   10  07539
2362                H                       WAIT FOR ACTION  1  07541  .
2363                CS     DATAFD&99        CLEAR DATA FIELD  6  07542  / 10999
2364                MU     %F5,FILE,R       READ HAD        10  07548  M %F5 10891 R
2365                BAL    *&1                              7  07558  R 07565 M
2366                BEF1   *&8              CHECK EXT COND   7  07565  R 07579 8
2367                B      *&7                              7  07572  J 07585
2368                ***  SET ERROR 41 ON ***
2369                SW     E41              SET ERROR IND ON  6  07579  , 01842
2370        READ HAD FOLLOWING TURNING OFF CE-HAD SWITCH CAUSES EXTERNAL COND
2371        POSSIBLLY CIC NOT WRITE HOME ADDRESSES CORRECTLY IN ROUTINE N15
2372                MLCA   @0C@,FILE&3      SET IKHD ADDR TO  12  07585  D 10521 10894 T
2373                MU     %F5,FILE,R         CYL 0 AND READ HAD  10  07597  M %F5 10891 R
2374                BAL    *&1                              7  07607  R 07614 M
2375                BEF1   N16XIT           CHECK FOR EXT COND  7  07614  R 07627 8
2376                    ***  SET ERROR 42 ON  ***
2377                SW     E42              SET ERROR IND ON  6  07621  , 01843
2378        READ HAD USING ADDRESS OF CYL 000 WHEN ACCESS IS AT CYL 253 DOES
```

```
PGLIN     LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION
2379                NOT CAUSE EXT COND.POSSIBLE FAILURE OF CE-HAO SWITCH OFF OR ITS
2380                ASSOCIATED CKTS.
2381      N16XIT    B      MONITR                                      7  07627  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  C1  ADDRS  INSTRUCTION
2383
2384                ***  TEST ROUTINE DESCRIPTION  ***
2385                ***  TEST FLAG DETECTION AND SWITCHING  ***
2386          THIS ROUTINE ADDRESSES EACH  OF THE TRACRS FLAGGED IN ROUTINE 16
2387          WITH A READ HAD INSTRUCTION.THE DATA READ BACK IS CHECKED FOR THE
2388          CODE CHARACTER WRITTEN ON THE ALTERNATE TRACKS,IF THE CHARACTER
2389          IS NOT PRESENT ERROR 43 IS INDICATED.
2390
2391          FORMAT REQUIRED
2392          SAME AS WRITTEN IN ROUTINE N13
2393
2394     N17        NCP                                                1  07634  N
2395                CC       a17a              ROUTINE ID              2  07636
2396                MRCG     CEADDR,FILE       LOAD ADDR              12  07637  D 10342 10891 5
2397     TST17      CS       DATAFD&99         CLEAR DATA FIELD        6  07649  / 10999
2398                MLCWS    @Ma,DATAFD&18     SET TERMINATING WMGM   12  07655  D 10487 10918 7
2399                MU       %F5,FILE,R        READ HAD               10  07667  M %F5 10891 R
2400                BAI      *&1                                       7  07677  R 07684 M
2401                BCE      CHKFLG,DATAFD&2,A WAS ALTERNATE READ     12  07684  B 07709 10902 A
2402               ***  SET ERROR 43 ON  ***
2403                SW       E43               SET ERROR IND ON        6  07696  , 01844
2404          READ HAD OF A FLAGGED TRACK DOES NOT READ ALTERNATE TRACK.
2405                B        MONITR                                    7  07702  J 02101
2406     CHKFLG     A        a1a,FILE&5        ADD 1 TO TKHD ADDR     11  07709  A 10489 10896
2407     CKALT3     BCE      N17XIT,FILE&5,6   CYL COMPLETE           12  07720  B 07739 10896 6
2408                B        TST17               CHECKED               7  07732  J 07649
2409     N17XIT     B        MONITR                                    7  07739  J 02101
```

```
PGLIN    LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2411
2412                ***  TEST ROUTINE DESCRIPTION  ***
2413                ***  WRITE & WRITE CHECK FORMAT  ***
2414          THIS ROUTINE WRITES AND WRITE CHECKS A FORMAT ON CYLINDER 253.
2415         ANY STATUS ERRORS CAUSED BY THE WRITE FORMAT SETS ERROR 44 ON.
2416         ANY STATUS ERRORS CAUSED BY THE WRITE CHECK SETS ERROR 45 ON.
2417
2418         FORMAT ORGANIZATION
2419         GAP1--HA1--GAP2--HA2 6 CHARS--X GAP--REC ADDR 10 CHARS--Y GAP--
2420
2421         FORMAT DATA FIELD USED
2422         111112
2423    N18          NCP                                                     1  07746  N
2424                 CC      @18@                                            2  07748
2425                 CS      DATAFD&99                                       6  07749  / 10999
2426                 MRCG    CEADDR,FILE          LOAD FILE ADDR            12  07755  D 10342 10891 $
2427                 MRCWG   HA1-32,DATAFD        LOAD FORMAT               12  07767  D 10142 10900 L
2428                 MU      %F7,FILE,W           WRITE FORMAT              10  07779  M %F7 10891 W
2429                 BAI     *&8                  CHECK ALL INDICATORS       7  07789  R 07803 G
2430                 B       *&14                                            7  07796  J 07816
2431                ***  SET ERROR 44 OR  ***
2432                 SW      E44                  SET ERROR IND ON           6  07803  , 01845
2433          WRITE FORMAT,6 BIT MODE,CAUSES STATUS ERROR
2434                 BAI     STACHK               GO TO STATUS ERROR         7  07809  R 03086 G
2435                 WCC     1,FILE                 RETURN HERE FOR WCC     10  07816  M %F3 10891 W
2436                 BAI     *&8                  CHECK ALL INDICATORS       7  07826  R 07840 G
2437                 B       N18XIT                                          7  07833  J 07853
2438                ***  SET ERROR 45 ON  ***
2439                 SW      E45                  SET ERROR IND ON           6  07840  , 01846
2440          WRITE CHECK FORMAT CAUSES STATUS ERROR
2441                 BAI     STACHK               GO TO STATUS ERROR         7  07846  R 03086 G
2442    N18XIT       B       MONITR                 ROUTINE,RETURN HERE      7  07853  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2444
2445                ***  TEST ROUTINE DESCRIPTION  ***
2446                ***  TEST WRITE TRACK WITH ADDRESSES OPER  ***
2447          THIS ROUTINE WRITES A RECORD AND READS IT BACK ,IT COMPARES THE
2448          DATA READ WITH THE DATA WRITTEN.IF IT DOES NOT COMPARE EQUAL
2449          ERROR 46 IS INDICATED.ALL STATUS ERRORS ARE ALSO INDICATED.
2450
2451          FORMAT REQUIRED
2452          SAME AS WRITTEN BY ROUTINE N18
2453
2454          DATA FIELD ORGANIZATION
2455          REC ADDR 6 CHARS--RECORD 2 CHARS
2456
2457          DATA FIELD USED
2458          123456#-
2459
2460     N19  NOP                                                           1  07860  N
2461          CC        @19@              ROUTINE ID                       2  07862
2462          MRCG      CEADDR,FILE       LOAD ADDR                       12  07863  D 10342 10891 $
2463          CS        DATAFD&99         CLEAR DATA FIELD                 6  07875  / 10999
2464          MRCWG     ALLBITS,DATAFD    LOAD DATA FIELD                 12  07881  D 10320 10900 D L
2465          MLCS      @6@,FILE&5        SET ADDR ABOVE TRCKS            12  07893  D 10544 10896 3
2466                                      THAT ARE FLAGGED
2467          MU        %F6,FILE,W        WRITE TRCK WITH ADDR            10  07905  M %F6 10891 W
2468          BAL       STACHK            BRCH ON ANY IND                  7  07915  R 03086 M G
2469          CS        DATAFD&7           RETURN HERE                     6  07922  / 10907
2470          MU        %F6,FILE,R        READ  TRCK WITH ADDR            10  07928  M %F6 10891 R
2471          BAL       STACHK            BRCH ON ANY IND                  7  07938  R 03086 M G
2472          C         DATAFD&7,ALLBIT&7   RETURN HERE                   11  07945  C 10907 10327
2473          BE        N19XIT            COMPARE DATA READ TO             7  07956  J 07969 S
2474                                      DATA WRITTEN
2475               ***  SET ERROR 46 ON  ***
2476          SW        E46               SET ERROR IND ON                 6  07963  , 01847
2477       DATA READ DOES NOT COMPARE TO DATA WRITTEN
2478     N19XIT  B      MONITR                                             7  07969  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2480
2481                ***  TEST ROUTINE DESCRIPTION  ***
2482                ***  TEST TRACK WITHOUT ADDRESSES OP  ***
2483          THIS ROUTINE PERFORMS A TRACK WITHOUT ADDRESSES WRITE AND READ,
2484          THE DATA READ IS COMPARED TO THE DATA WRITTEN AND IF IT DOES NOT
2485          COMPARE EQUAL ERROR 47 IS INDICATED.ALL STATUS ERRORS ARE ALSO
2486          INDICATED.
2487
2488          FORMAT REQUIRED
2489          SAME AS WRITTEN BY ROUTINE N18
2490
2491          DATA FIELD ORGANIZATION
2492          RECORD 2 CHARS
2493
2494          DATA FIELD USED
2495          +-
2496     N20  NOP                                                   1  07976  N
2497          DC     @20@              ROUTINE ID                  2  07978
2498          MRCG   CEACOR,FILE       LOAD ADDR                  12  07979  D 10342 10891 $
2499          CS     DATAFD&99         CLEAR DATAFD                6  07991  / 10999
2500          MRCWG  ALLBIT&6,DATAFD   LOAD DATA FIELD            12  07997  D 10326 10900 DL
2501          MLCS   @6@,FILE&5        SET ADDR ABOVE IRCKS       12  08009  D 10544 10896 3
2502                                  TAHT ARE FLAGGED
2503          MU     %F2,FILE,W        WRITE TRACK NO ADDRS       10  08021  M %F2 10891 W
2504          BAI    STACHK            GO TO STATUS ERROR          7  08031  R 03086 MG
2505          CS     DATAFD&1          ROUTINE,RETURN HERE         6  08038  / 10901
2506          MU     %F2,FILE,R        READ TRACK NO ADDRS        10  08044  M %F2 10891 R
2507          BAI    STACHK            GO TO STATUS ERROR          7  08054  R 03086 MG
2508          SW     DATAFD                                        6  08061  , 10900
2509          C      ALLBIT&7,DATAFD&1 CHECK DATA READ BACK       11  08067  C 10327 10901
2510          BE     N20XIT            IF IT IS GOOD BRCH         7  08078  J 08091 S
2511               ***  SET ERROR 47 ON  ***
2512          SW     E47               SET ERROR IND ON           6  08085  , 01848
2513       DATA READ DOES NOT COMPARE WITH DATA READ
2514     N20XIT  B      MONITR                                     7  0809'  J 0[illegible]1
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2516
2517                ***  TEST ROUTINE DESCRIPTION  ***
2518                ***  TEST SINGLE RECORD OP  ***
2519          THIS ROUTINE PERFORMS A SINGLE RECORD WRITE AND READ,USING THE
2520         RECORD ADDRESS WRITTEN IN ROUTINE N19.THE READ DATA IS COMPARED
2521         TO THE WRITE DATA AND IF IT DOES NOT COMPARE ERROR 48 IS
2522         INDICATED.ALL STATUS ERRORS ARE ALSO INDICATED.
2523
2524         FORMAT REQUIRED
2525         SAME AS WRITTEN BY ROUTINE N18
2526
2527         DATA FIELD USED
2528         *-
2529
2530      N21        NCP                                                    1  08098  N
2531                 DC      @21@              ROUTINE ID                   2  08100
2532                 CS      DATAFD&99         CLEAR DATA FIELD             6  08101  / 10999
2533                 MLCA    ALLBIT&5,FILE&7   LOAD ADDR                  12  08107  D 10325 10898 I
2534                 MRCWG   ALLBIT&6,DATAFD   LOAD DATA FIELD             12  08119  D 10326 10900 L
2535                 MU      %F1,FILE,W        WRITE SINGLE REC            10  08131  M %F1 10891 W
2536                 BAI     STACHK            GO TO STATUS ERROR           7  08141  R 03086 M
2537                 CS      DATAFD&1           ROUTINE,RETURN HERE         6  08148  / 10901
2538                 MU      %F1,FILE,R        READ SINGLE REC             10  08154  M %F1 10891 R
2539                 BAI     STACHK            GO TO STATUS ERROR           7  08164  R 03086 M
2540                 SW      DATAFD             ROUTINE RETURN HERE         6  08171  , 10900
2541                 C       ALLBIT&7,DATAFD&1 CHECK DATA READ BACK        11  08177  C 10327 10901
2542                 BE      N21XIT            IF IT IS GOOD BRCH           7  08188  J 08201 S
2543                ***  SET ERROR 48 ON  ***
2544                 SW      E48                                            6  08195  , 01849
2545        31141  DATA READ DOES NOT COMPARE TO DATA WRITTEN
2546      N21XIT     B       MONITR                                         7  08201  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2548
2549                ***  TEST ROUTINE DESCRIPTION  ***
2550                ***  TEST CYO OPERATION  ***
2551          IF CYC IS AVAILABLE A TRACK WITHOUT ADDR OP IS USED TC WRITE A
2552          2 CHAR RECORC ON EACH TRACK IN CYL 253,THE WRITTEN IS CO ON TRACK
2553          0,01 ON TRACK 1,AND SO ON THRU 39 ON TRACK 39.A READ CYO IS
2554          ISSUED,ADCRESSING THE BOTTOM TRACK ON CYL 253,AND THE DATA READ
2555          IS COMPAREC TO THE 40 RECORDS WRITTEN.IF THE DATA READ DOES NOT
2556          COMPARE ERROR 49 IS INDICATED.THE 40 RECORDS ARE REWRITTEN USING
2557          A WRITE CYC AND THE PRCGRAM BRANCHES BACK TO THE READ CYO.THE
2558          REAC-WRITE CYO ARE REPEATED 1C TIMES.
2559
2560          FORMAT REQUIRED
2561          SAME AS WRITTEN BY ROUTINE N18
2562
2563          DATA FIELD ORGANIZATION
2564          40 2 CHARACTER RECCRDS
2565
2566          DATA FIELD USED
2567          000102030405060708091011121314151617181920212223242526272829303l3
2568          233343536373839
2569     N22  NCP                                                           1  08208  N
2570          CC        a22a                                               2  08210
2571          B         TYP2              ROUTINE ID                       7  08211  J 01607
2572          CCW       aCYOa,G                                            3  08220
2573          CCW       a a,G                                              1  08222
2574          BCE       *&8,*-13,1        BRCH IF CYC AVAIL                12  08224  B 08243 08222 1
2575          B         N22XIT                                             7  08236  J 08524
2576          S         TENCNT                                             6  08243  S 09991
2577          MRCG      CEADDR,FILE       LOAD ADDR                        12  08249  D 10342 10891 $
2578          CS        DATAFD&99         CLEAR DATA FIELD                 6  08261  / 10999
2579          MLCWA     a0Ca,DATAFD&1     LOAD                             12  08267  D 10521 10901 X
2580          MLCWS     aMa,CATAFD&2          DATA FIELD                   12  08279  D 10487 10902 7
2581     TST22  MU      %F2,FILE,W        WRITE TRCK NO ADDRS              10  08291  M %F2 10891 W
2582          BCBI      *-16                                               7  08301  R 08291 2
2583          BAI       STACHK            BRCH ON ANY ERRCR                7  08308  R 03086 M
2584          A         a1a,DATAFD&1      UPDATE RECORD                    11  08315  A 10489 10901
```

```
PGLIN  LABEL   OPCOD  OPERAND                 COMMENTS                  CT  ADDRS  INSTRUCTION
2585           A      @1@,FILE&5              UPDATE TRACK ADDR         11  08326  A 10489 10896
2586           BCE    *&8,FILE&4,6            BRCH IF CYL COML          12  08337  B 08356 10895 6
2587           B      TST22                                             7   08349  J 08291
2588           CS     DATAFD&99               CLEAR DATA FIELD          6   08356  / 10999
2589           MLCWS  @M@,DATAFD&80           SET TERMINATING WMGM      12  08362  D 10487 10980 7
2590           MRCG   CEADDR,FILE             RELOAD FILE ADDR          12  08374  D 10342 10891 $
2591    RDCYO  MU     %F@,FILE,R              READ CYO CYL 253          10  08386  M %F@ 10891 R
2592           SBR    DATA&4                  STORE BAR AFTER READ      7   08396  G 01714 B
2593           BAI    STACHK                  GO TO STATUS CHECK        7   08403  R 03086 M
2594           SW     DATAFD                   ROUTINE,RETURN HERE      6   08410  , 10900
2595           C      CYOFLD,DATAFD&79        CHECK DATA READ           11  08416  C 10436 10979
2596           BE     PASS22                  IF IT IS GOOD BRCH        7   08427  J 08464 S
2597                  *** SET ERROR 49 ON ***
2598           SW     E49,EXTRA&1             SET ERROR IND ON          11  08434  , 01850 03005
2599      DATA READ DOES NOT COMPARE TO DATA WRITTEN
2600           MRCWG  BREG,DATA&7             MOVE MESSAGE              12  08445  D 09998 01717 L
2601           B      N22XIT                                            7   08457  J 08524
2602    PASS22 A      @1@,TENCNT              ADD 1 TO PASS COUNT       11  08464  A 10489 09991
2603           BZ     N22XIT                  BRCH AFTER 10TH PASS      7   08475  J 08524 V
2604    WRTCYO MLCA   CYOFLD,DATAFD&79        LOAD DATA FIELD           12  08482  D 10436 10979 T
2605           MU     %F@,FILE,W              WRITE CYO CYL 253         10  08494  M %F@ 10891 W
2606           BAI    STACHK                  GO TO STATUS CHECK        7   08504  R 03086 M
2607           CS     DATAFD&79                ROUTINE RETURN HERE      6   08511  / 10979
2608           B      RDCYO                                             7   08517  J 08386
2609    N22XIT B      MONITR                                            7   08524  J 02101
```

```
PGLIN   LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
2611
2612                ***  TEST ROUTINE DESCRIPTION  ***
2613                ***  TEST SEEK COMPLETE,BLOCK INTERUPT,& RELEASE  ***
2614          IF PRIORITY IS AVAILABLE A SEEK IS ISSUED AND ALERT MODE IS
2615          ENTERED.THE PROGRAM DELAYS AND IF NO INTERUPT OCCURES ERROR 51
2616          IS INDICATED.IF THE INTERUPT OCCURES A NO-OP IS ISSUED AND BUSY
2617          IS CHECKED,IF THE ACCESS IS STILL BUSY ERROR 52 IS INDICATED.IF
2618          THE 7631 IS A MODLE 3 A SEEK IS ISSUED FOLLOWED BY A SET BLOCK
2619          INTERUPT AND THE PROGRAM ENTERS ALERT MODE.A DELAY FOLLOWS DURING
2620          WHICH TIME NO INTERUPT SHOULD OCCURE,IF IT DOES ERROR 53 IS
2621          INDICATED.FINALLY A RELEASE INSTRUCTION IS ISSUED AND STATUS
2622          ERRORS ARE CHECKED.
2623
2624   N23    NCP                                                          1  08531  N
2625                CC      @23@                ROUTINE ID               2  08533
2626                BCE     *&8,1264,1          BRCH IF PRIORITY        12  08534  B 08553 01264 I
2627                B       N23XIT                                       7  08546  J 08983
2628                B       TYP2                REQUEST MOD INFO         7  08553  J 01607
2629                DCW     @ENTER A 1 IF USING MOD 3 OR 5 7631@,G      34  08593
2630   MODNUM       DCW     @ @,G                                        1  08595
2631                MLCA    @0C00@,FILE&S       LOAD ADDR               12  08597  D 10506 10896 I
2632                MRCWG   PRITST,108          SET UP INTERUPT LOC     12  08609  D 10438 00108 D L
2633                S       LNGCNT              RESET DELAY COUNTER      6  08621  S 10104
2634                SC      1,FILE              SEEK ACCESS             10  08627  M &F0 10891 R G
2635                BAI     *&1                                          7  08637  R 08644 M
2636                BEPA    *&1                 ENTER ALERT MODE         7  08644  Y 08651 E
2637   DELAYS       A       3I@,LNGCNT          WAIT                    11  08651  A 10489 10104
2638                C       LNGCNT,@32000@          FOR                 11  08662  C 10104 10548
2639                BE      *&8                         SEEK             7  08673  J 08687 S
2640                B       DELAYS                  COMPLETE INTERUPT    7  08680  J 08651
2641                BXPA    *&1                 EXIT ALERT MODE          7  08687  Y 08694 X
2642              ***  SET ERROR 51 ON  ***
2643                SW      E51                 SET ERROR IND ON         6  08694  . 01852
2644          A SEEK DOES NOT CAUSE AN INTERUPT WHEN IT IS COMPLETE
2645                MRCWG   INTR,1C1            RESTORE INTERUPT LOC    12  08700  D 02007 00101 D L
2646                B       N23XIT                                       7  08712  J 08983
2647   GOTINT       MW      **0,FI**,V          **0 NO**                    087    M     10(    V
```

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PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
2648                MRCWG  INTR,1C1              RESET INTERUPT LOC        12  08729  D 02007 00101 D L
2649                BA1    *&1                                              7  08741  R 08748 G M
2650                BCB1   *&8                    CHECK BUSY                7  08748  R 08762 2
2651                B      PREVNT                                           7  08755  J 08775
2652                ***  SET ERROR 52 ON  ***
2653                SW     E52                   SET ERROR IND ON          6  08762  , 01853
2654          A SEEK CAUSES AN INTERUPT WHEN IT IS COMPLETE,BUT A NO-OP INDI-
2655          CATES THE ACCESS IS STILL BUSY
2656                B      N23XIT                                           7  08768  J 08983
2657     PREVNT     BCE    *&8,MODNUM,1          BRCH IF MODLE 3 7631      12  08775  B 08794 08595 1
2658                B      N23XIT                                           7  08787  J 08983
2659                MRCWG  BLKTST,108            SET UP INTERUPT LOC       12  08794  D 10446 00108 D L
2660                MLCA   @9#20@,FILE&5         RESET FILE ADDRESS        12  08806  D 10552 10896 I
2661                SC     1,FILE                SEEK ACCESS               10  08818  M %F0 10891 R
2662                BA1    *&1                                              7  08828  R 08835 G M
2663                MU     *F4,FILE,W            SET BLOCK INT             10  08835  M *F4 10891 W
2664                BA1    *&1                                              7  08845  R 08852 G M
2665                BEX1   STACHK,L D            BRCH ON ANY BUT N T       7  08852  R 03086 D L
2666                BEPA   *&1                     RETURN HERE             7  08859  Y 08866 E
2667                S      LNGCNT                RESET DELAY COUNT         6  08866  S 10104
2668     DELAY6     A      @1@,LNGCNT            WAIT FOR                  11 08872  A 10489 10104
2669                C      LNGCNT,@32000         POSSIBLE ERRONEOUS        11 08883  C 10104 10548
2670                BE     *&8                   INTERUPT                  7  08894  J 08908 S
2671                B      DELAY6                                           7  08901  J 08872
2672                BXPA   *&1                   EXIT ALERT MODE           7  08908  Y 08915 X
2673                B      RELESE                                           7  08915  J 08947
2674                ***  SET ERROR 53 ON  ***
2675     BADINT     SW     E53                   SET ERROR IND ON          6  08922  , 01854
2676          A SEEK OP FOLLOWED BY A SET BLOCK INTERUPT DOES NOT BLOCK INTERPT
2677                MRCWG  INTR,1C1              RESET INTERUPT LOC        12  08928  D 02007 00101 D L
2678                B      N23XIT                                           7  08940  J 08983
2679     RELESE     MRCWG  INTR,1C1              RESET INTERUPT LOC        12  08947  D 02007 00101 D L
2680                MU     %F9,FILE,W            RELEASE 7631              10  08959  M %F9 10891 W
2681                BA1    *&1                                              7  08969  R 08976 G M
2682                BEX1   STACHK,L D            BRCH ON ANY BUT N T       7  08976  R 03086 D L
2683     N23XIT     B      MONITR                  ROUTINE,RETURN          7  08983  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERANC                                          CT  ADDRS  INSTRUCTION

2685
2686                ***  TEST ROUTINE DESCRIPTION  ***
2687                ***  TEST WRITE INHIBIT,HAO,WRITE FORMAT SWITCHES  ***
2688          THIS IS RUN ONLY IN THE MANUAL MODE,IT BEGINS BY REQUESTING THAT
2689          THE HAC,AND WRITE FORMAT SWITCHES BE TURNED OFF.WITH THESE
2690          SWITCHES OFF A WRITE HAO IS ISSUED AND NOT READY IS CHECKED,IF IT
2691          IS NOT ON ERROR 54 IS INDICATED.A WRITE FORMAT WITH WDC OP IS
2692          ISSUED AND EXT COND IS CHECKED,IF IT IS NOT ON ERROR 55 IS INDI-
2693          CATED.THE ROUTINE REQUESTS THAT THE HAO AND WRITE INHIBIT
2694          SWITCHES BE TURNED ON.A WRITE OP TRYS TO RE-WRITE A RECORD AND
2695          READ IT BACK,IF THE RECORD IS WRITTEN ERROR 56 IS INDICATED.
2696
2697          RECORD USED WHEN ATTEMPTING HAO WRITE -HAO SWITCH OFF-
2698          881234564-
2699
2700          FORMAT USED WHEN ATTEMPTING WRITE FORMAT  -WRT FMT SWITCH OFF-
2701          444444333333333334333333333333341111111112
2702
2703          RECORD USED WHEN ATTEMPTING WRITE  -WRITE INHIBIT SWITCH ON-
2704          99
2705
2706     N24        NOP                                                      1  08990  N
2707                CC     @24@                                              2  08992
2708                BCE    *&8,SPTAD1,1       BRCH IF MANUAL MODE            12  08993  B 09012 01005 I
2709                B      N24XIT                                            7  09005  J 09344
2710                B      TYP1                                              7  09012  J 01593
2711                DCW    @HAO&WRT FMT SWS OFF@,G                           19  09037
2712                H                         WAIT FOR ACTION                1  09039  .
2713                MRCWG  CEADDR,FILE        LOAD FILE ADDR                 12  09040  D 10342 10891 D L
2714                MLCA   @88@,DATAFD&1      LOAD                           12  09052  D 10554 10901 I O
2715                MRCWG  ALLBIT,DATAFD&2         DATA FIELD                12  09064  D 10320 10902 L
2716                SC     1,FILE             POSITION ACCESS                10  09076  M %F0 10891 R
2717                BCBI   *-16                                               7  09086  R 09076 2 G
2718                BAI    *&1                                               7  09093  R 09100 M
2719                MU     %F5,FILE,W         WRITE HAO                      10  09100  M %F5 10891 W
2720                BCBI   *-16                                               7  09110  R 09100 2 G
2721                BAI    *&1                                               7  09117  R 09124 M
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2722                BNR1   *&7                 CHECK FOR NOT RDY     7  09124  R 09137 1
2723               *** SET ERROR 54 ON ***
2724                SW     E54                 SET ERROR IND ON      6  09131  , 01855
2725          WRITE HAD CAN BE PERFORMED WITH HAD SWITCH OFF
2726                CS     DATAFD&99           CLEAR DATA FIELD      6  09137  / 10999
2727                SW     DATAFD                                    6  09143  , 10900
2728                MRCG   HA1-32,DATAFD       LOAD                 12  09149  D 10142 10900 $
2729                MRCWG  RECADR-1,DATAFD&30     FORMAT            12  09161  D 10235 10930 L
2730                MU     %F7,FILE,W           WRITE FORMAT        10  09173  M %F7 10891 W
2731                BCB1   *-16                                      7  09183  R 09173 2
2732                BA1    *&1                                       7  09190  R 09197 M
2733                BEF1   *&7                 BRCH ON EXT COND      7  09197  R 09210 8
2734               *** SET ERROR 55 ON ***
2735                SW     E55                 SET ERROR IND ON      6  09204  , 01856
2736          WRITE FORMAT CAN BE PERFORMED WITH WRITE FORMAT SWITCH OFF
2737                B      TYP1                                      7  09210  J 01593
2738                DCW    @WRITE INHIBIT&HAD SWS ON@,G            24  09240
2739                H                          WAIT FOR ACTION       1  09242  .
2740                CS     DATAFD&99           CLEAR DATA FIELD      6  09243  / 10999
2741                MLCA   @99@,DATAFD&1       LOAD                 12  09249  D 10556 10901 T
2742                MLCWS  @M@,DATAFD&2           DATA FIELD        12  09261  D 10487 10902 7
2743                MU     %F2,FILE,W          WRITE TRCK NO ADDRS   10  09273  M %F2 10891 W
2744                BA1    *&1                                       7  09283  R 09290 M
2745                CS     DATAFD&1            CLEAR DATA FIELD      6  09290  / 10901
2746                MU     %F2,FILE,R          READ TRACK NO ADDRS   10  09296  M %F2 10891 R
2747                BA1    *&1                                       7  09306  R 09313 M
2748                C      DATAFD&1,@99@       CHECK DATA READ       11  09313  C 10901 10556
2749                BE     *&6                 IT SHOULD NOT COMP    7  09324  J 09338 S
2750                B      N24XIT                                    7  09331  J 09344
2751               *** SET ERROR 56 ON ***
2752                SW     E56                 SET ERROR IND ON      6  09338  , 01857
2753          WRITE TRACK WITHOUT ADDR CAN BE PERFORMED WITH WRITE INHIBIT
2754          SWITCH ON
2755     N24XIT     B      MONITR                                    7  09344  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERANC                                          CT  ADDRS  INSTRUCTION
2757
2758                ***  TEST ROUTINE DESCRIPTION  ***
2759                ***  RESTORE FLAGGED TRACKS ON DIAGNOSTIC CYL 253  ***
2760          THIS ROUTINE RESTORES THE HOME ADDRESSES ON THE TRACKS USED  IN
2761           THE FLAGGING ROUTINES N16 & N17.
2762      N25       NCP .                                                    1  09351  N
2763                DC     @25@                ROUTINE ID                    2  09353
2764                CS     DATAFD&99           CLEAR DATAFLD                 6  09354  / 10999
2765                MRCWG  CEADDR,FILE         RESET ADDR                   12  09360  D 10342 10891 DLD
2766                MRCWG  FILE&2,DATAFD       LOAD ADDR INTO               12  09372  D 10893 10900 L
2767                MRCWG  FILE&7                DATA FIELD                  6  09384  D 10898
2768                SC     1,FILE              POSITION ACCESS              10  09390  M %F0 10891 R
2769                BCB1   *-16                                              7  09400  R 09390 2G
2770                BA1    *&1                                               7  09407  R 09414 M
2771                B      TYP1                                              7  09414  J 01593
2772                DCW    @WRT INHIBIT OFF,HAD&CE-HAD SNS ON@,G            33  09453
2773                H                          WAIT FOR CE ACTION            1  09455  .
2774      REMOVE    MU     %F5,FILE,W          WRITE HAD                    10  09456  M %F5 10891 W
2775                BCB1   *-16                                              7  09466  R 09456 2G
2776                BA1    *&1                                               7  09473  R 09480 MS
2777                BEX1   STACHK,SM           CHECK ALL BUT WLR             7  09480  R 03086 M
2778                SW     FILE&4                RETURN HERE                 6  09487  , 10895
2779                A      @1@,FILE&5          UPDATE FILE ADDR             11  09493  A 10489 10896
2780                MRCG   FILE&2,DATAFD       MOVE ADDR TO DATA FD         12  09504  D 10893 10900 $
2781                BCE    N25XIT,FILE&5,6     BRCH IF ALL FLAGS            12  09516  B 09535 10896 6
2782                B      REMOVE               REMOVED                      7  09528  J 09456
2783      N25XIT    B      MONITR                                            7  09535  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2785
2786                ***  TEST ROUTINE DESCRIPTION  ***
2787                ***  LOCATE CHANNELS THAT HAVE 7631 ADAPTERS  ***
2788          THIS ROUTINE USES THE INFORMATION ON THE CHANNEL CARDS TO
2789        LOCATE AVAILABLE 7631.THE ROUTINE CAUSES THE PROGRAM TO BE
2790        INITIALIZED ACCORDING TO THE CHANNEL LOCATED.WHEN ALL CHANNELS
2791        HAVE BEEN CHECKED THE ROUTINE ENDS THE PROGRAM.
2792      N26         NOP                                                   1  09542  N
2793                  DC      @26@                                          2  09544
2794      UPIX15      A       @57@,X15          UPDATE IX 15               11  09545  A 10558 00099
2795                  A       @3@,X14                                      11  09556  A 10495 00094
2796                  BCE     ENDTST,X15,M      BRCH IF ALL CHANNELS TRIED 12  09567  B 09896 00099 QM
2797                  BCE     *&8,O&X15,F       BRCH IF FILES ON THIS CHANNEL 12  09579  B 09598 00MMO QQ F
2798                  B       UPIX15                                       7  09591  J 09545
2799                  MLCA    CODE3&X14,TSTCH                              12  09598  D 10DN6 09629 T
2800                  B       CHALTR                                       7  09610  J 01046
2801                  DCW     TOP               TOP LIMIT                  5  09621  09642
2802                  DC      BOTTOM-1          LO LIMIT                   5  09626  03542
2803                  DCW     @ @                                          1  09627
2804                  DC      @ @                                          1  09628
2805      TSTCH       DC      @ @                                          1  09629
2806                  MLCS    TSTCH,CHLMES&7    MOVE CHANNEL #             12  09630  D 09629 09656 3
2807      TOP         B       TYP2                                         7  09642  J 01607
2808       CHLMES     DCW     @TST CHL  ,ENTER 2 DIGIT ACC&MOD ADDR TO BE USED@  47  09649
2809                  DC      @,ENTER 99 IF NO TEST ON THIS CHANNEL@,G     36  09731
2810                  DCW     @  @,G                                       2  09734
2811                  MLCA    *-13,CEADDR&1     MOVE ADDR SELECTED         12  09736  D 09734 10343 T
2812                  MRCG    CEADDR,FILE                                  12  09748  D 10342 10891 $
2813                  C       CEADDR&1,@99@     CHECK FOR NO TEST          11  09760  C 10343 10556
2814                  BE      UPIX15            BRCH IF NO TEST            7  09771  J 09545 S
2815                  B       TYP2                                         7  09778  J 01607
2816                  DCW     @HAO,CE-HAO,CE-WRT ON FOR THIS CHL 7631.WRT FMT ON@  49  09833
2817                  DC      @ FOR SLTD ACC&MOD,SELECT MODE@,G            29  09862
2818                  DCW     @ @,G                                        1  09864
2819                  MLCS    *-13,SPTAD1       MOVE MODE                  12  09866  D 09864 01005 3
2820                  ZA      &NC1,X3           LOAD IX 3                  11  09878  QM 10563 00039
2821                  B       NO1               GO TEST CHANNEL            7  09889  J 03476
```

```
PGLIN     LABEL     OPCOD  OPERAND                                                  CT  ADDRS  INSTRUCTION
2822      ENDTST    B      TYP1                                                      7  09896  J 01593
2823                DCW    @PASS,INSURE ALL 1302/7631 SWS ARE OFF,RESET ALL @       48  09950
2824                DC     @INOP LATCHES@,G                                         12  09962
2825                H                                                                1  09964  .
2826                BCE    2000,TAD3,1          BRCH IF REPEATING                  12  09965  B 02000 01003 1
2827                B      400                                                       7  09977  J 00400
2828      PREP      B      PRGCTL               ONE INSTRUCTION LOOP                 7  09984  J 02273
2829                              NOT AVILABLE RETURN TO SELECT ANCTHER OPT
```

```
PGLIN  LABEL    OPCOD  OPERAND                                                          CT  ADDRS  INSTRUCTION
2831   TENCNT   DCW    @0@                                                               1  09991
2832    EREG    DCW    @E REG@,G                                                         5  09992
2833    BREG    DCW    @B REG@,G                                                         5  09998
2834   BRCH0    B      RESET1                                                            7  10004  J 03519
2835            DCW    @M@                                                               1  10011
2836   BRCH1    B      HANG1                                                             7  10012  J 03662
2837            DCW    @M@                                                               1  10019
2838   ZERO     DCW    @000000@                                                          6  10025
2839    ALLCHR  DCW    @ .¤BTMC$*B,L-/,%SSMB#@.TMMABCDEFGHI'JKLMNOPQR*STUV@             50  10026
2840            DC     @WXYZ05678912340,G                                               14  10089
2841    ACCMES  DC     @ACCR FLD@,G                                                      8  10091
2842   LNGCNT   DCW    @000000@                                                          5  10104
2843   BRCH2    B      HANG2                                                             7  10105  J 05494
2844            DCW    @M@                                                               1  10112
2845   CCN1     DCW    DATAFD&41                                                         5  10117  10941
2846   BRCH3    B      HANG3                                                             7  10118  J 05946
2847            DCW    @M@                                                               1  10125
2848    CHRMES  DCW    @ILLGL CHAR@,G                                                   10  10126
2849   CCN2     DCW    DATAFD&38                                                         5  10141  10938
2850   HA1      DCW    @4444443333333333334333333333333340                             33  10174
2851   HA2      DC     @1111111111@                                                     9  10183
2852   LONGAP   DCW    @2222222222222220                                                15  10198
2853   RECADR   DC     @1111111111111211111111111112111111111120,G                     38  10236
2854    TSTFMT  DCW    @4444443333333333333333333333333333333340,G                     40  10238
2855    TSTFT6  DCW    @4444441111111111111111111111111111111120,G                     40  10279
2856    ALLBIT  DCW    @123456B-@,G                                                      8  10320
2857   BRCH4    B      HANG4                                                             7  10329  J 06720
2858            DCW    @M@                                                               1  10336
2859   CCN3     DCW    DATAFD&16                                                         5  10341  10916
2860    CEADDR  DCW    @009#2088@,G                                                      8  10342
2861    FLAGS   DCW    @124567@                                                          6  10351
2862            DCW    @00010203040506070809101112131415161718192021222324@            50  10406
2863   CYCFLD   DC     @252627282930313233343536373839@,G                               30  10436
2864   PRITST   B      GOTINT                                                            7  10438  J 08719
2865            DCW    @M@                                                               1  10445
2866   BLKTST   B      BADINT                                                            7  10446  J 08922
2867            DCW    @M@                                                               1  10453
```

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
2868	CODE3	DCW	@ @	3	10456	
2869		DCW	@%R1@	3	10459	
2870		DCW	@¤X2@	3	10462	
2871		DCW	@Q M33@	3	10465	
2872		DCW	@.14@	3	10468	
2873	CVRLAP	DCW	@ @	3	10471	
2874			@@@@@	3	10474	
2875			@***@	3	10477	
2876			@$$$@	3	10480	
2877			@###@	3	10483	
2878		LTORG			10484	
2878			@N@	1	10484	
2878			@+@	1	10485	
2878			@LD@	1	10486	
2878			@MG@	1	10487	
2878			@ @	1	10488	
2878			@1@	1	10489	
2878			@00209@	5	10494	
2878			@3@	1	10495	
2878			@7@	1	10496	
2878			@0C237@	5	10501	
2878			@2@	1	10502	
2878			@0000@	4	10506	
2878			@1275@	4	10510	
2878			@3C@	2	10512	
2878			N26	5	10517	09542
2878			@6C@	2	10519	
2878			@0C@	2	10521	
2878			@20@	2	10523	
2878			@4400@	4	10527	
2878			@7760@	4	10531	
2878			@11@	2	10533	
2878			@21@	2	10535	
2878			@4@	1	10536	
2878			@888@	3	10539	
2878			@888A@	4	10543	
2878			@6@	1	10544	
2878			@3200@	4	10548	

DC03 PROGRAM CONSTANTS

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
2878			@9#20@			
2878			@88@			
2878			@99@			
2878			@57@			
2878			NO1			
2879		ORG	10891	4	10552	
2880	FILE	DCW	@009#2088@,G	2	10554	
2881	DATAFD	DCW	@ @	2	10556	
2882		DS	98	2	10558	
2883		LOAD		5	10563	03476
2884		END	2000		10891	
				8	10891	
				1	10900	
					10998	

J02000

END OF ASSEMBLY

6.25.00.0 DC04 MECHANICAL AND HYDRAULIC TEST DESCRIPTION

This test uses an oil warm-up routine before beginning the testing of the access.

The program tests every available access on every channel in an automatic or manual mode. The automatic mode requires no manual intervention and can be run from a Load-and-Go maintenance tape. The manual mode does require intervention and cannot be run unattended.

The program starts by running a five-minute oil warm-up routine; if in manual mode, an additional 20 minutes is run. Making of the inner and outer CE switches is checked, and the time to move from the rezore position to cylinder 000 checks the action of the detent.
Ten passes through maximum movement seek routine are made, followed by 100 passes through a random seek test. The program now times four seeks with the access being moved from the outside portion of the disk inward to the center. The time to return from the inner position of the disk outward toward the edge of the disk is also checked. The seeks are repeated 10 Times, the average, the times are printed on the console and the next available module is tested.

6.25.01.0 OPERATING PROCEDURE

The standard procedures outlined in the package write-up apply to this program. In addition, the following procedures are used to run this program.

01.1 SWITCH SETTINGS PREVIOUS TO RUNNING PROGRAM

A. Write HAO switch on (on all 7631's to be tested).

B. *Write Inhibit switch on (on all 7631's to be tested).

C. All 1301 modules not to be tested are set inoperative.

*NOTE: Write Inhibit switch need only be turned on when running in manual mode.

01.2 SPECIAL REQUESTS(MADE ONLY IN THE MANUAL MODE)

A. "CE-HAO ON"

CE turns on CE HAO switch and presses start. This request is made if during the random seek test the access fails to position correctly. With the CE-HAO switch on, the HA1 is read into memory and displayed on the typewriter.

6.25.01.0 OPERATING PROCEDURE (continued)

B. "ADDR READ, 0000000, CE-HAO OFF"

The CE turns off the CE-HAO switch and presses start to continue.

01.3 SPECIAL OPTION

There is one special option for this program (option code 8) IF THIS option is selected the program will run the seek routines that allow the CE to select a to and from address to be timed. An average time is typed out every 100 seeks. The routine is exited by pressing request and selecting the continue option.

01.4 STANDARD OPTIONS

Two of the standard options are not available with this program, they are:

A. Alter Routine Sequence - option code 3

B. One Instruction Loop - option code 5

01.5 SPECIAL TADS

There is one special tad (Memory Loc. 1004) which selects the manual mode when it is set to 1. This tad is set to $\overline{1}$ when the program is loaded.

01.6 MANUAL MODE

When the manual mode has been selected, the program:

A. Runs the oil warm-up routine for a total of 25 minutes.

B. Requests intervention when access fails to position correctly in the random seek test.

01.7 SUMMARY TYPEOUT

The summary of errors typeout is not available with this program.

6.25.02.0 OPERATING HINTS

02.1 SELECTING MANUAL MODE (ALTER SPECIAL TAD)

Use program option code 2 (alter memory) to alter special TAD 1 to a 1 or $\overline{1}$. Manual mode should normally be selected during the first five minute warm-up period. Special TAD memory location 01004.

02.2 SELECTING OPTION 8 (Select Seek Addresses)

Use normal procedure for selecting control options enter "8". Program will request that to and from addresses be entered.* Program will seek between addresses entered, giving average seek time every 100 seeks. Press inq request and select code "7" to continue with program.

* NOTE: When entering the to and from addresses, two 8 digit addresses must be entered; the access, module, track addresses & HA 2 are all required.

02.3 POWER ON WARM-UP

If power has just been brought up, the additional 20 minute warm-up must be run for valid results. To run the extra 20 minute warm-up, select manual mode during the first five minute warm-up.

6.25.03.0 PROGRAM STOPS

03.1 ERROR STOPS

None.

03.2 NORMAL STOPS (MANUAL MODE ONLY)

Memory Loc.	Reason
04692	Wait for CE to turn on CE-HAO switch and press start.
04769	Wait for CE to turn off CE-HAO switch and press start.

6.25.04.0 TYPEOUTS (OTHER THAN REQUEST OR STANDARD TYPEOUTS)

04.1 "AUTO MODE, HAO SWITCH ON"

This is to remind the CE that this program runs in automatic mode when loaded and that the HAO switch on the 7631 must be on.

04.2 "TST MODE 0 ACC 0 CH0"

This tells the CE which module and access on which channel is being tested at present.

6.25.04.0 TYPEOUTS (continued)

04.3 "BEGINNING 5 MINUTE WARM-UP"

"BEGINNING 20 MINUTE WARM-UP"

"WARM-UP COMPLETE TEST BEGINNING"

These typeouts are simply reference points to let the CE know where he is at.

NOTE: The 20 minute message is given only when running in manual mode.

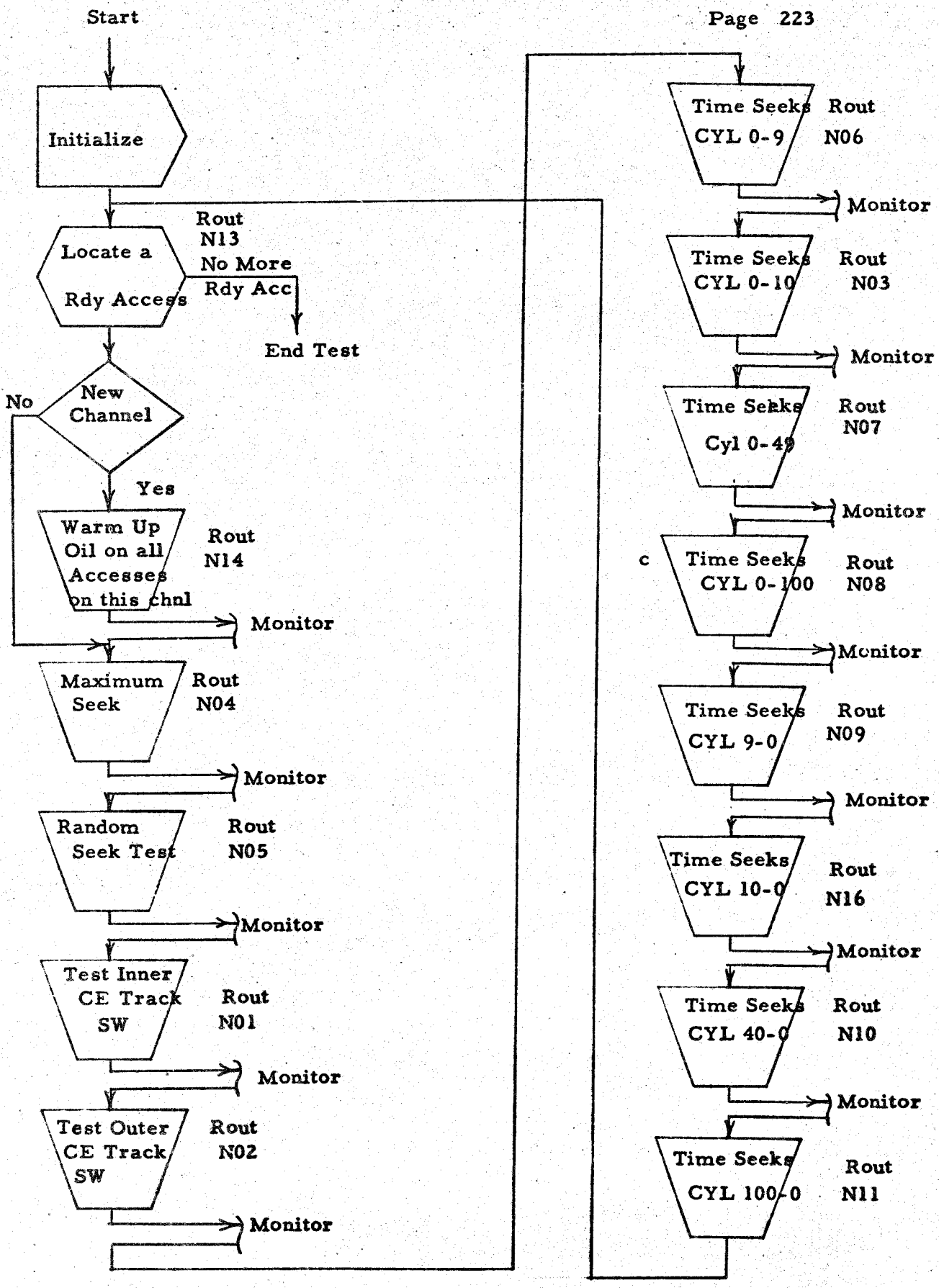
04.4 **Seek time results are typed in the following table after all the timings have been made.**

Seek - From	To	Time - Was	Should be	In MSEC
0000	0360		50	
0000	0400		120	
0000	1600		120	
0000	4000		180	
0360	0000		50	
0400	0000		120	
1600	0000		120	
4000	0000		180	

04.5 **Results of timing access motion from rezero to Cyl 000 is typed as follows: " SEEK TIME FROM REZERO TO CYLO IS , IT SHOULD BE MSEC"**

6.25.05.0 **FLOW CHART**

The following flow chart is designed to give a general picture of the test routine's relationship to one another.


Start
Initialize
Locate a Rdy Access
Rout N13
No More Rdy Acc
End Test
No
New Channel
Yes
Warm Up Oil on all Accesses on this chnl
Rout N14
Monitor
Maximum Seek
Rout N04
Monitor
Random Seek Test
Rout N05
Monitor
Test Inner CE Track SW
Rout N01
Monitor
Test Outer CE Track SW
Rout N02
Monitor
Time Seeks CYL 0-9
Rout N06
Monitor
Time Seeks CYL 0-10
Rout N03
Monitor
Time Seeks Cyl 0-49
Rout N07
Monitor
c
Time Seeks CYL 0-100
Rout N08
Monitor
Time Seeks CYL 9-0
Rout N09
Monitor
Time Seeks CYL 10-0
Rout N16
Monitor
Time Seeks CYL 40-0
Rout N10
Monitor
Time Seeks CYL 100-0
Rout N11

6.25.06.0 ROUTINE/ERROR INDEX DC04

This index should be used to locate routines and errors in the program listing.

```
PGLEN   LABEL   OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1CC2            LOAD
1CC3            CTL    2
1CC4
1CC5            DEFINE STANDARD TADS                     **
1CC6
1CC7            ORG    1000                                **        01000
1CC8    TAD0    DCW    a a                                        1  01000
1CC9    TAD1           a a                                        1  01001
1CD0    TAD2           a a                                        1  01002
1CD1    TAD3    DCW    a a                                        1  01003
1CD2                                                     **
1CD3            DEFINE SPECIAL TADS
1CD4                                                     **
1CD5    SPTAD0  DCW    a a                                        1  01004
1CD6    SPTAD1         a a                                        1  01005
1CD7    SPTAD2         a a                                        1  01006
1CD8    SPTAD3         a a                                        1  01007
1CD9    SPTAD4         a a                                        1  01008
1CE0    SPTAD5         a a                                        1  01009
1CE1    SPTAD7         a a                                        1  01010
1CE2    SPTAD8         a a                                        1  01011
1CE3    SPTAD9         a a                                        1  01012
1CE4
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1026                  *** I/C DICOST PROGRAM ***
1027                *** ONE INSTRUCTION LOOP ROUTINE ***
1028          WHEN THE CE SELECTS A ONE INSTRUCTION LOOP THE I/O INSTRUCTION
1029        IN THIS ROUTINE IS ALTERED AND THE LOOP IS ENTERED.NOTE THAT THE
1030        BRANCH ON INQUIRY INSTRUCTION IS THE ONLY EXIT FROM THE LOOP.
1031      LOOP      MU     %11,0,R          I/O INST BEING LUP D     10  01013  M %11 00000 R
1032                BAI    *&1                                       7  01023  R 01030 M
                                                                                  G
1033                BNQ    PRGCTL           BRCH ON INQ TO PRGCL     7  01030  J 02273 Q
1034                B      LOOP             CONTINUE TO LOOP         7  01037  J 01013
1035                H                                               1  01044  .
1036
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1038                       *** I/C DICOST PROGRAM ***
1039                    *** CHANNEL ALTER ROUTINE ***
1040          THIS ROUTINE ALTERS ALL I/C INSTRUCTIONS,BRANCH-ON-STATUS-
1041        INDICATOR-ON INSTRUCTIONS,AND BRANCH ON CHANNEL OVERLAP IN PRO-
1042        CESS INSTRUCTIONS ACCORDING TO THE CHANNEL INDICATED.THIS IS DONE
1043        BY SCANNING A DEFINED AREA OF MEMORY AND ALTERING THESE INSTRUC-
1044        TIONS.
1045
1046      CHALTR    SBR    X5               STORE ADDR                        7  01045  G 00049 B
1047                MLCA   9&X5,X7          LOAD IX6 & IX7                   12  01052  D 00*.9 00059 I
                                                                                                    S
1048      SCAN      SCNLA  0&X6,0&X6        SCAN FOR WM                      12  01064  D 00*.0 00*.0 B
1049                SAR    X6               STORE ADDR OF OPER                7  01076  G 00054 A
1050                C      X6,X7            HAS ALL OF FLD BEEN              11  01083  C 00054 00059
1051                BH     13&X5            SEARCHED IF SO BRCH               7  01094  J 00*/3 U
1052                MLCS   1&X6,*&12        STORE OP CODE                    12  01101  D 00*.1 01124 3
1053                BCE    MLCRU,CODES,     IS OP CODE M                     12  01113  B 01149 02604
1054                BCE                     IS OP CODE L                      1  01125  B
1055                BCE                     IS OP CODE U                      1  01126  B
1056                BCE    RX3OR1           IS OP CODE R                      6  01127  B 01168
1057                BCE                     IS OP CODE X                      1  01133  B
1058                BCE                     IS OP CODE 3                      1  01134  B
1059                BCE                     IS OP CODE 1                      1  01135  B
1060                BCE    JAY              IS OP CODE J                      6  01136  B 01187
1061                B      SCAN             GO FIND NEXT OPER                 7  01142  J 01064
1062      MLCRU     MLCS   10&X5,2&X6        CHEANGE CH-MODE CHAR             12  01149  D 00*/0 00*.2 3
1063                B      SCAN             GO FIND NEXT OPER                 7  01161  J 01064
1064      RX3OR1    MLCS   11&X5,1&X6        CHANGE B-I-S-I-O OP              12  01168  D 00*/1 00*.1 3
1065                B      SCAN             GO FIND NEXT OPER                 7  01180  J 01064
1066      JAY       MLCS   7&X6,*&12         STORE MODIFIER                   12  01187  D 00*.7 01210 3
1067                BCE    ONE234,MCDS,     IS MODIFIER A 1                  12  01199  B 01221 02608
1068                BCE                     IS MODIFIER A 2                   1  01211  B
1069                BCE                     IS MODIFIER A 3                   1  01212  B
1070                BCE                     IS MODIFIER A 4                   1  01213  B
1071                B      SCAN             GO FIND NEXT OPER                 7  01214  J 01064
1072      ONE234    MLCS   12&X5,7&X6        CHANGE BOL MODIFIER              12  01221  D 00*/2 00*.7 3
1073                B      SCAN             GO FIND NEXT OPER                 7  01233  J 01064
1074                H                                                        1  01240  .
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1075
1076
1077                DEFINE SYSTEM & CHANNEL CONTROL CARDS
1078
1079                ORG    1233                                                 01233
1080                DCW    @FP6FMLFMTFMC383493@                             17  01249
1081                                                    **
1082                DEFINE PROGRAM TITLE
1083                                                    **
1084                ORG    1250                                                 01250
1085                DCW    @DC04B@,6                                         5  01254
1086
1087                LOCATE THE SYSTEM & CHANNEL CARDS
1088
1089                ORG    1256                                                 01256
1090      SYSTEM    DC     @                                              @    50  01256
1091                       @      @                                           7  01312
1092                ORG    1289                                                 01289
1093      CHNL1     DC     @                                              @    50  01289
1094                       @      @                                           7  01345
1095                ORG    1346                                                 01346
1096      CH...2    DC     @                                              @    50  01346
1097                       @      @                                           7  01402
1098                ORG    14C3                                                 01403
1099      CHNL3     DC     @                                              @    50  01403
1100                       @      @                                           7  01459
1101                ORG    1460                                                 01460
1102      CHNL4     DC     @                                              @    50  01460
1103                       @      @                                           7  01516
1104
```

```
PGLIN   LABEL   OPCOD  OPERAND                  CT  ADDRS  INSTRUCTION
1106                     *** I/C DICOST PROGRAM ***
1107                  *** TYPE AND REQUEST FOR INTERVENTION ***
1108          THIS ROUTINE IS USED TO TYPE ALL MESSAGES AND REQUESTS FOR
1109        MANUAL INTERVENTION.THE ROUTINE WILL TYPE A MESSAGE FROM A COMMON
1110        DATA FIELD,OR THE MESSAGE MAY BE LOCATED IMMEDIATELY AFTER THE
1111        BRANCH INSTRUCTION TO THIS ROUTINE.IF A REPLY IS REQUIRED A READ
1112        CONSOLE PRINTER OPERATION IS ISSUED.THIS ROUTINE IS USED TO TYPE
1113        ALL MESSAGES IN THIS PROGRAM.
1114
1115    TYMES   SBR     TYPXIT&5          STORE RETURN ADDR          7  01517  G 01591 B
1116    TYPE    WCP     201               TYPE MESSAGE              10  01524  M %TO 00201 W
1117            BEX1    TYPE,M S          BRCH ON ANY BUT WLR        7  01534  R 01524 SMG
1118            BA1     *&1                                          7  01541  R 01548 M
1119    SW11    NOPWM                                                1  01548  N
1120    LA860   RCP     0                 READ CONSOLE PRINTER      10  01549  M %TO 00000 R
1121            BEX1    *-16,M S          BRCH ON ANY BUT WLR        7  01559  R 01549 SMG
1122            BA1     *&1                                          7  01566  R 01573 M
1123            CW      SW11&1            TURN OFF SWITCH 11         6  01573  ¤ 01549
1124            CS      330               CLEAR PRINT AREA           6  01579  / 00330
1125            CS                                                   1  01585  /
1126    TYPXIT  B       0                 RETURN TO DICOST           7  01586  J 00000
1127    TYP1    SBR     X1                STORE ADDR OF MESG         7  01593  G 00029 B
1128            B       *&14                                         7  01600  J 01620
1129    TYP2    SBR     X1                STORE ADDR OF MESG         7  01607  G 00029 B
1130            SW      REPLY&1           TURN ON REPLY SW           6  01614  , 01652
1131            WCP     0&X1              TYPE MESSAGE              10  01620  M %TO 000#0 W
1132            SBR     X5                SAVE ADDR                  7  01630  G 00049 BSMG
1133            BEX1    *-23,M S          BRCH ON ANY BUT WLR        7  01637  R 01620 SMG
1134            BA1     *&1                                          7  01644  R 01651 M
1135    REPLY   NOPWM                     BRCH                       1  01651  N
1136            B       RDCON             IF REPLY REQUIRED          7  01652  J 01666
1137            B       0&X5              RETURN                     7  01659  J 00##0
1138    RDCON   RCP     0&X5              REPLY TO MESSAGE          10  01666  M %TO 00##0 R
1139            SBR     X1                SAVE ADDR                  7  01676  G 00029 BSMG
1140            BEX1    *-23,M S          BRCH ON ANY BUT WLR        7  01683  R 01666 SMG
1141            BA1     *&1                                          7  01690  R 01697 M
1142            CW      REPLY&1                                      6  01697  ¤ 01652
```

```
PGLIN  LABEL  OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1143          B      0&X1      RETURN                         7  01703  J 00040
1144   DATA   MLCWS  &N&.PASS1  RESET FIRST PASS INST        12  01710  D 08712 01944 7
1145          BCE    *&13,1264,1 BRCH IF PRIORITY AVAILABLE  12  01722  B 01746 01264 1
1146          MLCWS  &N&,MONITR67 ALTER PRIORITY INST TO NO-OP 12 01734  D 08712 02108 7
1147          MRCWG  *&9,1230  RESTORE CHANNEL ALTER ROUTINE 12  01746  D 01766 01230 0
1148          B      PASS1&7                                 7  01758  J 01951
1149          H                                              1  01765  .
1150          DC     &.73&                                   3  01768
1151          DCW    &J&                                     1  01769
1152          DC     SCAN                                    5  01774  01064
1153          DC     & &                                     1  01775
1154          DCW    &.&,G                                   1  01776
1155          DS     12                                         01789
1156
1157          *** ERROR TABLES THESE ARE USED FOR ERROR ***
1158          *** SUMMARIES AND ERROR INDENTIFICATION ***
1159
1160          ORG    *&X00                                      01800
1161          ORG    *&1                                        01801
1162   STPTAB DCW    &L&                                     1  01801
1163    E1    DC     & &                                     1  01802
1164    E2          & &                                     1  01803
1165    E3          & &                                     1  01804
1166    E4          & &                                     1  01805
1167    E5          & &                                     1  01806
1168    E6          & &                                     1  01807
1169    E7          & &                                     1  01808
1170    E8          & &                                     1  01809
1171    E9          & &                                     1  01810
1172    E10         & &                                     1  01811
1173    E11         & &                                     1  01812
1174    E12         & &                                     1  01813
1175    E13         & &                                     1  01814
1176    E14         & &                                     1  01815
1177    E15   DC    & &                                     1  01816
1178    E16         & &                                     1  01817
1179    E17         & &                                     1  01818
1180    E18         & &                                     1  01819
```

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
1181	E19		a a	1	01820	
1182	E20		a a	1	01821	
1183	E21		a a	1	01822	
1184	E22		a a	1	01823	
1185	E23		a a	1	01824	
1186	E24		a a	1	01825	
1187	E25	DC	a a	1	01826	
1188	E26	DC	a a	1	01827	
1189	E27		a a	1	01828	
1190	E28		a a	1	01829	
1191	E29		a a	1	01830	
1192	E30		a a	1	01831	
1193	E31		a a	1	01832	
1194	E32		a a	1	01833	
1195	E33		a a	1	01834	
1196	E34		a a	1	01835	
1197	E35		a a	1	01836	
1198	E36		a a	1	01837	
1199	E37		a a	1	01838	
12C0	E38		a a	1	01839	
12C1	E39		a a	1	01840	
12C2	E40		a a	1	01841	
12C3	E41		a a	1	01842	
12C4	E42		a a	1	01843	
12C5	E43		a a	1	01844	
12C6	E44		a a	1	01845	
12C7	E45		a a	1	01846	
12C8	E46		a a	1	01847	
12C9	E47		a a	1	01848	
1210	E48		a a	1	01849	
1211	E49		a a	1	01850	
1212	E50		a a	1	01851	
1213	E51	DC	a a	1	01852	
1214	E52		a a	1	01853	
1215	E53		a a	1	01854	
1216	E54		a a	1	01855	
1217	E55		a a	1	01856	
1218	E56		a a	1	01857	

PGLIN	LABBL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
1219	ERRTAB	DC	8@&	1	01858	
1220		DC	& &	1	01859	
1221						

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1223                ***  INITIALIZE RCUTINE FOR THE DICOST PROGRAM ***
1224      INITLE    MCP    1250                PRINT TITLE          10  01860  M %TO 01250 W
1225                BCB1   *-16                                      7  01870  R 01860 2
1226                BA1    *&1                                       7  01877  R 01884 M
1227                CS     99                  RESET IND REG S      6  01884  / 00099
1228                SW     25                  SET WM IN IND REG 1  6  01890  , 00025
1229                MLCS   @*@,100             PREPARE TO LOAD 2-15 12  01896  D 08713 00100 3
1230                MRWR   25,30               LOAD IND REG 2-15    12  01908  D 00025 00030 %
1231                MRCWG  RESUME,1            MOVE RESET PROCEDURE 12  01920  D 02015 00001 D
1232                MRCWG  INTR,101            MOVE INTERUPT PROC   12  01932  D 02007 00101 L
1233      PASS1     B      DATA                GO DO  MORE INITIALIZING  7  01944  J 01710
1234                CW     LPRT,SW11&1                              11  01951  ¤ 02617 01549
1235                CS     E5D6                CLEAR AND RESET      6  01962  / 01857
1236                MLCWS  @L@,STPTAB           ERROR TABLE         12  01968  D 08714 01801 7
1237                B      START               GO TO ROUTINE INIT.  7  01980  J 03419
1238
1239                H                                               1  01987  .
1240                ORG    2000                                        02000
1241                B      INITLE                                   7  02000  J 01860
1242                ***  RESET & INTERUPT ROUTINES,THESE ROUTINES ***
1243                ***  ARE MOVED TO LOCATIONS 1 & 101
1244      INTR      BNQ    PRGCTL              RETURN TO PROG CNTRL     7  02007  J 02273 Q
1245                DCW    @MG@                                         1  02014
1246      RESUME    B      CKLUP                                        7  02015  J 02023
1247                DCW    @MG@                                         1  02022
1248      CKLUP     BW     MONITR,LPRT         CHECK FOR LOOP ROUT     12  02023  V 02101 02617 1
1249                BW     LOOP,LPINST         CHECK INST LOOP SW      12  02035  V 01013 02618 1
1250                CW     SW11&1,REPLY&1      CLEAR TYPE SWITCHES     11  02047  ¤ 01549 01652
1251                CW     EXTRA&1                                      6  02058  ¤ 03024
1252                CS     E5D6                CLEAR ERROR TABLE        6  02064  / 01857
1253                MLCWS  @L@,STPTAB                                  12  02070  D 08714 01801 7
1254                MLNA   X3,X2               LOAD IX 2               12  02082  D 00039 00034 /
1255                B      MONITR&7            GO TO MONITR             7  02094  J 02108
1256
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1258                   *** I/O DICOST PROGRAM ***
1259                ***       MONITOR ROUTINE       ***
1260          THE MONITOR IS ENTERED AFTER EVERY TEST ROUTINE IS COMPLETED,OR
1261        A STATUS ERROR HAS BEEN DETECTED AND INDICATED.IN THE CASE OF A
1262        STATUS ERROR MONITOR SIMPLY BRANCHES BACK TO THE POINT AT WHICH
1263        THE STATUS ERROR WAS DETECTED.WHEN ENTERED FROM THE END OF A
1264        TEST ROUTINE MONITOR CHECKS TO SEE IF THE CE PRESSED INQUIRY,THE
1265        ROUTINE IS BEING LOOPED,ANY ERRORS OCCURED,ALTER ROUTINE SEQUENCE
1266        IS SELECTED,OR THE NEXT SEQUENCIAL ROUTINE SHOULD BE RUN.
1267
1268     MONITR    SBR    X2                 STORE ADDR                       7  02101  G 00034 B
1269               BXPA   *-1                EXIT ALERT MODE                  7  02108  Y 02115 X
1270               BNQ    PRGCTL             WAS THERE AN INQ                 7  02115  J 02273 Q
1271     MONIT1    BW     0-X3,LPRT          RETURN IF LOOPING RT             12 02122  V 00000 02617 1
1272     MONIT2    MLCWS  @M@,224            SET WMGM SHORT MESG              12 02134  D 08715 00224 7
1273               B      ERRCTL                                              7  02146  J 02677
1274     MONIT3    NOP                                                        1  02153  N
1275               MLCWA  X2,X3              LOAD IX3                         12 02154  D 00034 00039 X
1276               MLCWS  @ @,224            CLEAR WMGM                       12 02166  D 08716 00224 7
1277               B      0-X2               GO TO NEXT ROUTINE               7  02178  J 000.0
1278     WHERE2    MLCWS  *-12,224           CLEAR WMGM                       12 02185  D 02184 00224 7
1279               BCE    *-8,0-X2,N         BRCH IF ROUT COMP                12 02197  B 02216 000.0 N
1280               B      0-X2               RETURN TO ROUTINE                7  02209  J 000.0
1281               BZN    *-8,1-X2,2         BRCH IF CHAR IS NUMR             12 02216  V 02235 000.1 2
1282               B      0-X2               RETURN TO ROUTINE                7  02228  J 000.0
1283               BZN    *-8,2-X2,2         BRCH IF CHAR IS NUMR             12 02235  V 02254 000.2 2
1284               B      0-X2               RETURN TO ROUTINE                7  02247  J 000.0
1285               BW     MONIT3,3-X2        BRCH IF CHAR HAS WM              12 02254  V 02153 000.3 1
1286               B      0-X2               RETURN TO ROUTINE                7  02266  J 000.0
1287
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1289                   *** I/O DICOST PROGRAM ***
1290                ***      PROGRAM CONTROL      ***
1291          WHEN THE CE PRESSES INQUIRY TO SELECT A STANDARD PROGRAM OPTION
1292        THIS ROUTINE IS ENTERED.THE CE ENTERS ON THE TYPEWRITER THE
1293        OPTION CODE DESIRED,ALONG WITH THE DATA NEEDED BY THE OPTION.THE
1294        ROUTINE DETERMINES WHICH OPTION HAS BEEN SELECTED AND INITIATES
1295        THE OPTION.
1296
1297      PRGCTL    RCPW   CTLFLD           READ THE CONSOLE PRT             10  02273  L %TO 00201 R
1298                SBR    X1                                               7  02283  G 00029 B
1299                BEXI   PRGCTL,M S      BRCH ON ANY BUT WLR              7  02290  R 02273 S M
1300                SW     CTLFLD&1                                         6  02297  . 00202
1301                BAI    *&1                                              7  02303  R 02310 G M
1302                CW     LPRT,LPINST     TURN OFF LOOP SWS                11  02310  ¤ 02617 02618
1303                MLWS   *,E1            CLEAR WM IN ERRCR                12  02321  D 02332 01802 4
1304                MRWR   E1,E2             TABLE                          12  02333  D 01802 01803 %
1305                MLCS   CTLFLD,*&12     MOVE CTL CODE ENTERD             12  02345  D 00201 02368 3
1306                BCE    ENDTST,CTLCOD,  IS CTL CODE BLANK                12  02357  B 08028 02616
1307                BCE    ALTADS          IS CTL CODE 1                     6  02369  B 02418
1308                BCE    ALTMEM          IS CTL CODE 2                     6  02375  B 02441
1309                BCE    LUPRT           IS CTL CODE 4                     6  02381  B 02500
1310                BCE    ONELUP          IS CTL CODE 5                     6  02387  B 02529
1311                BCE    RSTART          IS CTL CODE 6                     6  02393  B 02563
1312                BCE    CONT            IS CTL CODE 7                     6  02399  B 02586
1313                BCE    N15             IS CTL CODE 8                     6  02405  B 08059
1314                B      PRGCTL                                           7  02411  J 02273
1315      ALTADS    MLCA   CTLFLD&4,1C03    MOVE IN NEW TADS                 12  02418  D 00205 01003 T
1316                CS     MONIT1,299      CLEAR OUT CTL FLD                11  02430  / 02122 00299
1317      ALTMEM    MLCA   CTLFLD&5,*&9     MOVE ADDR TO BE ALTR             12  02441  D 00206 02461 T
1318                RCPW   0               ALTER MEMORY                     10  02453  L %TO 00000 R
1319                BEXI   *-16,M S        CHECK ALL BUT WLR                 7  02463  R 02453 S M
1320                BAI    *&1                                              7  02470  R 02477 G M
1321                CS     MONIT1,299      CLEAR THE CNTRL FLD              11  02477  / 02122 00299
1322      ALTSEQ    MLCWS  &M&,0&X1 G      SET WMGM AT END                  12  02488  D 08715 00040 7
1323      LUPRT     SW     LPRT            TURN ON LOOP SWITCH               6  02500  . 02617
1324                MLNA   CTLFLD&5,X2      LOAD IND REG2                    12  02506  D 00206 00034 /
1325                CS     MONIT2,299      CLEAR CNTRL FLD                  11  02518  / 02134 00299
```

```
PGLIN   LABEL    OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1326    CNELUP   SW     LPINST          TURN ON LOOP INST SW   6  02529  , 02618
1327    LUPINT   NOPNM                   THIS SW IS TURNED ON  1  02535  N
1328             B      @68                 BY ERRCTL         7  02536  J 02550
1329             B      PREP             GO TO PREPARE ROUT   7  02543  J 08413
1330             CW     LUPINT&1         TURN OFF SW          6  02550  = 02536
1331             B      LOOP                                  7  02556  J 01013
1332    RSTART   MLNA   CTLFLD65,X2      LOAD IND REG2        12  02563  D 00206 00034 /
1333             CS     MONIT2,299       CLEAR CNTRL FLD      11  02575  / 02134 00299
1334    CONT     CS     WHERE2,299       CLR CNTL FLD         11  02586  / 02185 00299
1335
1336             I/O DICOST CONSTANTS
1337    CODES    DCW    @J13XRULM@                             8  02604
1338    MODS     DCW    @4321@                                 4  02608
1339             DCW    @8@                                    1  02609
1340             DC     @7@                                    1  02610
1341             DC     @6@                                    1  02611
1342                    @5@                                    1  02612
1343                    @4@                                    1  02613
1344                    @2@                                    1  02614
1345                    @1@                                    1  02615
1346    CTLCOD          @ @                                    1  02616
1347    LPRT     DC     @ @                                    1  02617
1348    LPINST   DC     @ @                                    1  02618
1349    ADDRC2   DCW    ERRTAB           ADDR OF ERR TABLE     5  02623  01858
1350    ERR      DCW    @*ERROR@                               6  02629
1351     ACTION  DC     @REQ ERROR ACTION@,G                  16  02630
1352    ERCODE   DCW    @547P@                                 4  02650
1353     SAVIND  DCW    @1 2 4 8 A B@,G                       11  02651
1354     STIND   DC     @1 2 4 8 A B@,G                       11  02663
1355     NCERSW  DC     @ @                                    2  02675
1356
```

```
PGLIN    LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION

1358                  *** I/O DICOST PROGRAM ***
1359                ***      ERROR CONTROL      ***
1360          THIS ROUTINE DETERMINES IF ANY STATUS ERRORS OR PROGRAM DETECT-
1361        ED ERRORS HAVE TO BE INDICATED,IF THERE ARE THIS ROUTINE BUILDS
1362        THE ERROR MESSAGE AND HAS IF TYPED OUT.THIS ROUTINE ALSO CHECKS
1363        TAB 1 TO SEE IF A REQUEST FOR ERROR ACTION SHOULD BE MADE.
1364
1365              LOCATE FAILING INST
1366
1367     ERRCTL   MLCA   X2,X5              LOAD IND REG 5             12  02677  D 00034 00049 T
1368              S      @12,X5                                        11  02689  S 08717 00049
1369              SCNLA  0&X5,0&X5          SCAN THE ROUTINE           12  02700  D 00**0 00**0 S B
1370              SAR    X5                 STORE CHAR ADDR             7  02712  G 00049 A
1371              MLCS   1&X5,**&12         MOVE CHAR TO BE CHKD       12  02719  D 00**1 02742 3
1372              BCE    GOTONE,CCODES,     IS OP CODE M               12  02731  B 02775 02604
1373              BCE                       IS OP CODE L                1  02743  B
1374              BCE    SHORT1             IS OP CODE U                6  02744  B 02794
1375              C      X3,X5              HAS ROUTINE BEEN           11  02750  C 00039 00049
1376              BL     LOOFLD              SEARCHED                   7  02761  J 02818 T
1377              B      ERRCTL&12          GO CONTINUE THE SRCH        7  02768  J 02689
1378     GOTONE   MLCWA  10&X5,LOOP&9       LOAD THE LOOP INST         12  02775  D 00*/0 01022 X
1379              B      LOOFLD                                         7  02787  J 02818
1380     SHORT1   MLCWA  5&X5,LOOP&9        LOAD THE LOOP INST         12  02794  D 00**5 01022 X
1381              MLCS   @N@,LOOP           SET NO-OP FOR SHORT        12  02806  D 08712 01013 3
1382                                      INSTRUCTION
1383     LOOFLD   MLCA   LOOP&9,234           MOVE FAILING OPER        12  02818  D 01022 00234 T
1384              MLNA   X3,223               MOVE ADDR OF ROUT        12  02830  D 00039 00223 /
1385              ZA     ADDR02,X1            LOAD ND REG 1            11  02842  D 02623 00029 Q M Q
1386              ZA     @0C209@,X5           LOAD IND REG 5           11  02853  D 08722 00049 M
1387                   SCAN ERROR TABLE & UPDATA ERROR COUNT
1388     ERSCAN   SCNLA  0&X1,0&X1          SCAN THE FRROR TABLE       12  02864  D 000*0 000*0 S B
1389              SAR    X1                 STORE ADDR                  7  02876  G 00029 A
1390              BCE    AFTSRH,1&X1,L C    HAS TABLE BEEN COMP.       12  02883  B 02942 000*1 D L
1391              SW     X1-1              DEFINE ERROR                6  02895  , 00028
1392              MLNWA  X1,0&X5             MOVE ERROR CODE NO.        12  02901  D 00029 00**0 V
1393              A      @3@,X5              UPDATE IND REG 5          11  02913  A 08723 00049
1394                                    NINE TIMES
```

```
PGLIN   LABEL    OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1395             CW     16X1,X1-1          CLEAR WM S            11  02924  W 000*1 00028
1396             B      ERSCAN                                    7  02935  J 02864
1397                 LOAD PRINT FIELD WITH ERROR MESG
1398    AFTSRH   BCE    WHERE2,100C,1      BRCH IF BYPASSING ERRORS 12  02942  B 02185 01000 1
1399    ERROSW   NOP                                              1  02954  N
1400             BCE    WHERE2,209         BRCH IF NO ERRORS     12  02955  B 02185 00209
1401             SW     ERROSW&1           RESET ERROR SW         6  02967  . 02955
1402             MLCA   ERR,206            MOVE ERROR            12  02973  D 02629 00206 T
1403             MLCA   2&X3,ROUTID        MOVE ROUTINE IDENT    12  02985  D 000M2 03014 T
1404             B      TYP1               GO TYPE ROUTINE ID     7  02997  J 01593
1405             DCW    &ROUTINE &
1406    ROUTID   DC     &   &,G                                   3  03014
1407             B      TYPES                                     7  03016  J 01517
1408                 TYPE ADDITIONAL  ERROR INFORMATION
1409    EXTRA    NOPWM                                             1  03023  N
1410             MCP    DATA               PRINT EXTRA DATA      10  03024  M &TO 01710 W
1411             BCB1   *-16                                      7  03034  R 03024 2
1412             BA1    *&1                                       7  03041  R 03048 M
1413             CW     EXTRA&1                                   6  03048  . 03024
1414    ACT      BCE    *&8,1001,1         LOOP ACTION REQUIRED  12  03054  B 03073 01001 1
1415             B      WHERE2                                    7  03066  J 02185
1416             SW     LUPINT&1           TURN ON SWITCH         6  03073  . 02536
1417             MRCWG  ACTION,201         MOVE ACTION MESG      12  03079  D 02630 00201 L
1418             B      TYPES                                     7  03091  J 01517
1419             B      PRGCTL                                    7  03098  J 02273
1420
1421                 *** I/O DICOST PROGRAM ***
1422             *** DETERMINE WHICH STATUS INDICATORS ARE ON ***
1423        THIS ROUTINE DETERMINES WHICH STATUS INDICATORS ARE ON,ON THE
1424         CHANNEL BEING USED.THE INDICATORS FOUND  ON ARE STORED IN THE
1425          PRINT FIELD AND THE PROGRAM BRANCHES TO ERROR CONTROL.
1426    STACHK   SBR    X5                 STORE ADDR IN IND 5    7  03105  G 00049 B
1427             SBR    X2                                        7  03112  G 00034 B
1428             BW     0&X2,LPRT                                12  03119  V 000.0 02617 1
1429             S      &7&,X5             REDUCE ADDR BY 7      11  03131  S 08724 00049
1430             MLCS   0&X5,LOOP&10                             12  03142  D 00**0 01023 3
1431             MRCWG  STIND,237          MOVE STATUS CODES     12  03154  D 02663 00237 L
```

```
PGLIN   LABEL    OPCOD  OPERAND                    CT  ADDRS  INSTRUCTION
1432             MLCS   0&X5,NUOPCC    STORE CHNL CODE  12  03166  D 00**0 03196 3
1433             B      CHALTR                           7  03178  J 01045
1434             DCW    CNTERR         HIGH LIMIT        5  03189  03351
1435             DC     NOTRDY         LOW LIMIT         5  03194  03209
1436             DCW    @ @                              1  03195
1437    NUOPCO   DC     @ @                              1  03196
1438             DC     @ @                              1  03197
1439             ZA     @0C237@,X5     LOAD IX 5        11  03198  M 08729 00049
1440    NOTRDY   NOP                                     1  03209  N
1441             BNR1   CNTERR         CHECK FOR NOT READY  7  03210  R 03351 1
1442             B      UPIX           GO UPDATE IND REG  7  03217  J 03382
1443    BUSY     NOP                                     1  03224  N
1444             BCB1   CNTERR         CHECK FOR BUSY     7  03225  R 03351 2
1445             B      UPIX           GO UPDATE IND REG  7  03232  J 03382
1446    DATACK   NOP                                     1  03239  N
1447             BER1   CNTERR         CHECK DATA CHK     7  03240  R 03351 4
1448             B      UPIX           GO UPDATE IND REG  7  03247  J 03382
1449    EXTCND   NOP                                     1  03254  N
1450             BEF1   CNTERR         CHECK FOR EXT COND  7  03255  R 03351 8
1451             B      UPIX           GO UPDATE IND REG  7  03262  J 03382
1452    NOTRNS   NOP                                     1  03269  N
1453             BNT1   CNTERR         CHECK FOR NO TRANS  7  03270  R 03351 $
1454             B      UPIX           GO UPDATE IND REG  7  03277  J 03382
1455    WLR      NOP                                     1  03284  N
1456             BWL1   CNTERR         CHECK FOR WLR      7  03285  R 03351 -
1457             B      UPIX           GO UPDATE IND REG  7  03292  J 03382
1458             SW     NOTRDY&1,BUSY&1  RESET INSTRUCTIONS  11  03299  , 03210 03225
1459             SW     DATACK&1,EXTCND&1                11  03310  , 03240 03255
1460             SW     NOTRNS&1,WLR&1                   11  03321  , 03270 03285
1461             MRCG   237,SAVIND     SAVE IND          12  03332  D 00237 02651 $
1462             B      ERRCTL         RETURN            7  03344  J 02677
1463    CNTERR   SBR    X6             STORE RETURN ADDR  7  03351  G 00054 B
1464             A      @7@,X6         UPDATE RETURN ADDR  11  03358  A 08724 00054
1465             CW     ERROSW&1       TURN OFF ERROR SW  6  03369  ¤ 02955
1466             B      UPIX&19                          7  03375  J 03401
1467    UPIX     SBR    X6             STORE RETURN ADDR  7  03382  G 00054 B
1468             MLCS   @ @,0&X5       REMOVE STATUS CHAR  12  03389  D 08716 00**0 3
```

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1469		A	328,X5	UPDATE IND REG 5	11	03401	A 08730 00049
1470		B	0016	RETURN TO PROGRAM	7	03412	J 0000

```
PGLIN     LABEL     OPCOD  OPERAND                    CT  ADDRS  INSTRUCTION
1472      CTLFUD    EQU    201
1473                PST
```

```
                    INITIALIZE FOR DC04                                                    DC04          PAGE 242
RGLIN     LABEL     OPCOD  OPERAND                                                  CT  ADDRS  INSTRUCTION

1475                     *** TEST ROUTINE DESCRIPTION ***
1476                *** INITIALIZE COUNTERS & DELAY CONSTANTS ***
1477      START     CW     COLDSW&1,NUCHL&1                                          11  03419  W 04155 03753
1478                SW     ADDROO&1                                                   6  03430  , 08483
1479                S      LNGCNT              INITIALIZE                             6  03436  S 08684
1480                S      WARMCT                 ALL                                 6  03442  S 08683
1481                S      TIMCNT                   COUNTERS                          6  03448  S 08673
1482                S      LOCPTI                     USED                            6  03454  S 08667
1483                S      CORR                         IN                            6  03460  S 08680
1484                S      COUNT                       THIS                           6  03466  S 08664
1485                S      RUTCNT                        PROG                         6  03472  S 08653
1486                S      ADDROO&1                                                   6  03478  S 08483
1487                S      ADDROO                                                     6  03484  S 08482
1488                ZA     @01332@,X10         LOAD IX 10                            11  03490  M 08735 00074
1489                ZA     @OCOOO@,X15         LOAD IX 15                            11  03501  M 08740 00099
1490                BCE    C1410,1256,0        BRCH IF USING A 1410                  12  03512  B 03598 01256 0
1491                BCE    C1410I,1256,I       BRCH IF A 1410I                       12  03524  B 03567 01256 I
1492      C7010     MLCA   LOCPX,LOOPTI        SET TIMING CONSTANTS                  12  03536  D 08699 08667 T
1493                MLCA   CORRX,CORR            FOR A 7010                          12  03548  D 08701 08680 T
1494                B      GETSET                                                     7  03560  J 03634
1495      C1410I    MLCA   CORRI,CORR          SET TIMING CONSTANTS                  12  03567  D 08706 08680 T
1496                MLCA   LOCPI,LOOPTI          FOR A 1410I                         12  03579  D 08704 08667 T
1497                B      GETSET                                                     7  03591  J 03634
1498      C1410     MLCA   CORRO,CORR          SET TIMING CONSTANTS                  12  03598  D 08711 08680 T
1499                MLCA   LOCPO,LOOPTI           FOR A 1410                        12  03610  D 08709 08667 T
1500                BCE    TIMEIT-17,SPTADO,1  BRCH IF IN MANUAL MODE                12  03622  B 03665 01004 1
1501      GETSET    B      TYP1                                                       7  03634  J 01593
1502                DCW    @AUTO MODE,HAO SWITCH ON@,G                               23  03663
1503                WCP    BLANK               MOVE TYPE CARRIAGE                    10  03665  M &TO 08657 W
1504                BAI    *&1                                                        7  03675  R 03682 GM
1505      TIMEIT    WCP    BLANK               TRY TO TYPE AGAIN                     10  03682  M &TO 08657 W
1506                BAI    *&1                                                        7  03692  R 03699 GM
1507                BCBI   *&8                 BRCH BUSY                              7  03699  R 03713 2
1508                B      GOTEST                                                     7  03706  J 03731
1509                A      @0315@,TOTIME       ADD CONSTANT TO TIME                  11  03713  A 08744 08662
1510                B      TIMEIT                                                     7  03724  J 03682
1511      GOTEST    ZA     N13,X3              LOAD IX 3                             11  03731  M 07734 00039 QM
```

INITIALIZE FOR DCC4

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
1512		8	N13&10	7	03742	J 07744

```
PGLIN  LABEL    OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1514                    *** TEST ROUTINE DESCRIPTION ***
1515                    *** WARM UP HYDRAULIC OIL ***
1516          THIS ROUTINE OPERATES ALL READY ACCESS FOR 5 MINUTES IN ORDER TO
1517          INSURE THAT THE OIL IS AT 105 DEGREES TEMPETURE SO THAT THE SEEK
1518          TIMINGS MAY BE MADE USING THE FAST OSCILATOR.A MESSAGE INDICATES
1519          THE BEGINING AND END OF THE WARMUP PERIOD.IF POWER HAS JUST BEEN
1520          BROUGHT UP ON THE 1302 AN ADDITIONAL 20 MINUTE WARMUP PERIOD
1521          SHOULD BE TAKEN.THIS ADDITIONAL WARM-UP MAY BE SELECTED BY ALTER-
1522          ING SPECIAL TAC 0,LOC 1004 TO A 1.USE OPTION CODE 2 TO ALTER
1523          THE TAC WHILE IN THE FIRST 5 MINUTE WARM-UP PERIOD.
1524          WHEN THE WARM UP IS COMPLETE ALL ACCESS ARE REZEROED TO KEEP THE
1525          OIL CIRCULATING AND WARM.
1526
1527    N14   NOP                                       1  03749  N
1528          DC      @14@              ROUTINE ID      2  03751
1529    NUCHL NOPWM                                     1  03752  N
1530          B       N14XIT                            7  03753  J 04358
1531          SW      NUCHL&1                           6  03760  , 03753
1532          B       TYP1                              7  03766  J 01593
1533          DCW     @BEGINING 5 MINUTE WARMUP@,G     24  03796
1534          S       WARMCT                            6  03798  S 08683
1535          S       LNGCNT                            6  03804  S 08684
1536    BOTTOM S      ADR249&1          RESET           6  03810  S 08527
1537          S       ADR125&1                ACCESS AND 6  03816  S 08549
1538          S       ADR000&1                           6  03822  S 08560
                                                              MODULE ADDRESSES
1539    STAR16 SD     1,ADR000          SEEK ACC TO CYL 000 10  03828  M %F0 08559 R
1540          BCB1    *-16                              7  03838  R 03828 2
1541          BA1     *&1                               7  03845  R 03852 M
                                                                      G
1542          A       @1@,ADR000        UPDATE ACCESS ADDR 11 03852  A 08717 08559
1543          BCE     *&8,ADR000,2      BRCH IF ACCESS ADDR IS 2 12 03863 B 03882 08559 2
1544          B       STAR16                            7  03875  J 03828
1545          S       ADR000                            6  03882  S 08559
1546          A       @1@,ADR000&1      UPDATE MODULE ADDR 11 03888  A 08717 08560
1547          BCE     *&8,ADR000&1,0    BRCH IF MODULE ADDR IS 0 12 03899 B 03918 08560 0
1548          B       STAR16                            7  03911  J 03828
1549    STAR17 SD     1,ADR125          SEEK ACCESS TO CYL 125 10 03918  M %F0 08548 R
1550          BCB1    *-16                              7  03928  R 03918 2
```

```
PGLIN     LABEL     OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1551                BAI    *&1                               7  03935  R 03942 GM
1552                A      &1a,ADR125                       11  03942  A 08717 08548
1553                BCE    *&8,ADR125,2                     12  03953  B 03972 08548 2
1554                B      STAR17                            7  03965  J 03918
1555                S      ADR125                           6  03972  S 08548
1556                A      &1a,ADR125&1                     11  03978  A 08717 08549
1557                BCE    *&8,ADR125&1,0                   12  03989  B 04008 08549 0
1558                B      STAR17                            7  04001  J 03918
1559      STAR18    SC     1,ADR249                         10  04008  M &F0 08526 R
1560                BCBI   *-16                              7  04018  R 04008 2G
1561                BAI    *&1                               7  04025  R 04032 M
1562                A      &1a,ADR249                       11  04032  A 08717 08526
1563                BCE    *&8,ADR249,2                     12  04043  B 04062 08526 2
1564                B      STAR18                            7  04055  J 04008
1565                S      ADR249                           6  04062  S 08526
1566                A      &1a,ADR249&1                     11  04068  A 08717 08527
1567                BCE    *&8,ADR249&1,0                   12  04079  B 04098 08527 0
1568                B      STAR18                            7  04091  J 04008
1569                A      &1a,WARMCT                       11  04098  A 08717 08683
1570                BCE    *&15,WARMCT-2,5                  12  04109  B 04135 08681 5
1571                B      MONITR                            7  04121  J 02101
1572                B      BOTTOM                            7  04128  J 03810
1573                BCE    *&8,SPTADO,1                     12  04135  B 04154 01004 1
1574                B      WARM                              7  04147  J 04231
1575      COLDSW    NOPWM                                    1  04154  N
1576                B      NOMSG                            7  04155  J 04189
1577                B      TYP1                             7  04162  J 01593
1578                DCW    @BEGIN 20 MIN WARMUP@,G          19  04187
1579      NOMSG     SW     COLDSW&1                         6  04189  , 04155
1580                S      WARMCT                           6  04195  S 08683
1581                A      &1a,LNGCNT                       11  04201  A 08717 08684
1582                BCE    WARM,LNGCNT,5                    12  04212  B 04231 08684 5
1583                B      STAR16                            7  04224  J 03828
1584      WARM      SD     1,REZADR                         10  04231  M &F0 08570 R
1585                BCBI   *-16                              7  04241  R 04231 2G
1586                BAI    *&1                               7  04248  R 04255 M
1587                A      &1a,REZADR                       11  04255  A 08717 08570
1588                BCE    *&8,REZADR,2                     12  04266  B 04285 08570 2
```

```
                    WARM UP HYDRAULIC OIL
PGLIN     LABEL     OPCOD  OPERAND
1588                B      WARM
1590                S      REZADR              RESET ACCESS ADDR
1591                A      818,REZADR61        UPDATE MODU
1592                BCE    *69,REZÄDR61,0      BRCH IF MODULE ADR
1593                B      WARM
1594                B      TYPL
1595                DCW    &WARMUP COMPLETE,TEST BEGINING&,6
1596      KLAXIT    B      MONITR
1597
```

```
                    DC04                PAGE 246
CT   ADDRS   INSTRUCTION
 7   04278   J 04231
 6   04285   S 08570
11   04291   A 08717 08571
12   04302   B 04321 08571 0
 7   04314   J 04231
 7   04321   J 01593
29   04356
 7   04358   J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
 .
1599                       *** TEST ROUTINE DESCRIPTION ***
1600                       *** TEST WORST CASE SEEK ***
1601          THIS ROUTINE CAUSES THE ACCESS TO TRAVEL THE MAXIMUM DISTANCE,
1602          ACTUATING EVERY PISTON & GLOB EXCEPT THE 10 PISTON AND CAUSING
1603          THE LARGEST AMOUNT OF OIL CIRCULATION.THE ARRIVAL OF THE ACCESS
1604          AT CYL 249 IS VERIFIED AND ERROR 14 IS INDICATED IF IT IS INCOR
1605          RECT.THE ROUTINE IS REPEATED 10 TIMES.
1606
1607      NO4         NOP                                                  1  04365  N
1608                  DC      @04@              ROUTINE ID                 2  04367
1609      START4      SD      1,ADDR00          RESET ACCESS              10  04368  M %F0 08482 R
1610                  BCB1    *-16                                         7  04378  R 04368 2
1611                  BA1     STACHK            BRCH ON ANY ERROR          7  04385  R 03105 M G
1612                  MLCB    ADDR00&1,ADR249&1                           12  04392  D 08483 08527 L
1613                  SD      1,ADR249          SEEK CYL 249 FRCM 0       10  04404  M %F0 08526 R
1614                  BCB1    *-16                                         7  04414  R 04404 2
1615                  BA1     STACHK            BRCH ON ANY ERROR          7  04421  R 03105 M G
1616                  MU      %F5,ADR249,R      CHECK ARRIVAL             10  04428  M %F5 08526 R
1617                  BCB1    *-16                                         7  04438  R 04428 2
1618                  BA1     *&1                                          7  04445  R 04452 M G
1619      TWO49       BEF1    *&8                                          7  04452  R 04466 8
1620                  B       NO4CNT                                       7  04459  J 04486
1621                  BNT1    ERCR14                                       7  04466  R 04480 S B
1622                  B       NO4CNT                                       7  04473  J 04486
1623                  *** SET ERRCR 14 CN ***
1624      ERCR14      SW      E14               TURN ON ERROR COUNT        6  04480  , 01815
1625          ACCESS DID NOT ARRIVE AT CYL 249,READ RESULTS IN NO RECORD FOUND
1626      NO4CNT      A       @1@,RUTCNT        UPDATE PASS COUNT         11  04486  A 08717 08653
1627                  BCE     NO4XIT,RUTCNT,0   BRCH IF COUNT IS 10        12  04497  B 04516 08653 0
1628                  B       START4                                       7  04509  J 04368
1629      NO4XIT      B       MONITR                                       7  04516  J 02101
1630
```

```
PGLIN     LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION

1632                ***  RANDOM SEEK TEST  ***
1633                  THE SPEED OF THE CARRIAGE RETURN IS USED TO DEVELOPE A RANDOM
1634                NUMBER WHICH IS USED TO DEVELOPE A RANDOM ADDRESS FOR THE FILE.
1635                ONE HUNDRED SEEKS USING RANDOM ADDRESSES ARE ISSUED,EACH SEEK IS
1636                CHECKED FOR CORRECT ACCESS POSITION WITH A READ OP.IF THE ACCESS
1637                HAS REZEROED ERROR 15 IS INDICATED,IF THE ACCESS HAS POSITIONED
1638                INCORRECTLY ERROR 16 IS INDICATED.IN THE CASE OF ERROR 16 IF THE
1639                PROGRAM IS IN MANUAL MODE,-SPECIAL TAD 0 IS 1-THE HA1 ON THE FILE
1640                WILL BE READ OFF AND DISPLAYED ON THE CONSOLE FOR ANALYSIS.
1641
1642      NO5       NCP                                                 1  04523  N
1643                DC        @05@          ROUTINE ID                  2  04525
1644      START5    MLNWA     TOTIME,VARIAD&5   MOVE IN RANDOM ADDR     12  04526  D 08662 08641 V
1645                MLC8      ADDR00&1,VARIAD&1                         12  04538  D 08483 08637 L
1646                SC        1,VARIAD      SEEK ACCESS                 10  04550  M %F0 08636 R
1647                BCB1      *-16                                      7  04560  R 04550 2
1648                BA1       STACHK        BRCH ON ANY ERROR           7  04567  R 03105 G M
1649                MU        %F5,VARIAD,R  CHECK ARRIVAL               10  04574  M %F5 08636 K
1650                BCB1      *-16                                      7  04584  R 04574 2
1651                BA1       *&1                                       7  04591  R 04598 G M
1652                BEF1      *&8                                       7  04598  R 04612 8
1653                B         RANDOM                                    7  04605  J 04619
1654                BNT1      ERCR16                                    7  04612  R 04672 S B
1655      RANDOM    A         @77777@,TOTIME  ALTER VARIABLE            11  04619  A 08748 08662
1656                SW        VARIAD&2        BY 300 AND ADD            6  04630  , 08638
1657                A         TOTIME,VARIAD&5   RESULT TO TKHD ADR      11  04636  A 08662 08641
1658                A         @1@,COUNT     ADD 1 TO PASS COUNT         11  04647  A 08717 08664
1659                BZ        NO5XIT        BRCH AFTER 100 PASS         7  04658  J 04816 V
1660                B         START5&24                                 7  04665  J 04550
1661              *** SET ERROR 16 ON ***
1662      ERCR16    SW        E16,EXTRA&1   TURN ON ERROR IND            11  04672  , 01817 03024
1663        ACCESS DID NOT POSITION CORRECTLY,READ RESULTS IN NO RECORD FOUND
1664                MRCWG     VARIAD,DATA   MOVE FAILING ADDR           12  04683  D 08636 01710 D L
1665                BA1       STACHK        GO TO STATUS CHECK          7  04695  R 03105 G M
1666                BCE       *&8,SPTAD0,1  BRCH IF IN MANUAL MD        12  04702  B 04721 01004 1
1667                B         RANDOM                                    7  04714  J 04619
1668                B         TYP1          GO REQUEST THAT             7  04721  J 01593
```

RANDOM SEEK TEST

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1669		DCW	@CE-HAO ON@,G	CE-HAO BE TURNED ON	9	04736	
1670		H		WAIT FOR ACTION	1	04738	.
1671		MU	%F5,VARIAD,R	READ FAILING ADDR	10	04739	M %F5 08636 R
1672		BCB1	*-16		7	04749	R 04739 2 G
1673		BA1	*&1		7	04756	R 04763 M
1674		MLCA	VARFLD&6,ACRMSG&15	MOVE FAILING ADDR	12	04763	D 08651 04797 T
1675		B	TYP1	GO TYPE FAILING ADDR	7	04775	J 01593
1676	ACRMSG	DCW	@ACDR READ	,CE-HAO OFF@,G	27	04782	
1677		H	RANDOM	WAIT FOR ACTION	6	04810	. 04619
1678	NO5XIT	B	MONITR		7	04816	J 02101

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1680          THIS ROUTINE CHECKS THE MAKE AND BREAK OF THE INNER CE SWITCH
1681        BY SEEKING FROM CYL 10 TO 249,A READ OP CHECKS ARRIVAL AT THE
1682        PROPER TRACK AND IF THE CE SWITCH WAS MADE ERROR 2 IS INDICATED
1683        THE ACCESS IS NOW MOVED FROM CYL 249 TO 250 AND THE ARRIVAL IS
1684        VERIFIED BY A READ,IF THE CE SWITCH DID NOT MAKE ERROR 3 IS
1685        INDICATED.THE ROUTINE IS REPEATED 10 TIMES.
1686
1687       NO1       NOP                                                    1  04823  N
1688                 DC     @01@              ROUTINE ID                   2  04825
1689                 MLCB   ADDR00&1,ADRXXX&1                             12  04826  D 08483 08604 L
1690                 MLCB   ADDR00&1,ADR249&1                             12  04838  D 08483 08527 L
1691                 MLCB   ADDR00&1,ADR250&1                             12  04850  D 08483 08615 L
1692       CYRSHT    SD     1,ADRXXX          POSITION ACCESS AT CRITICAL POINT  10  04862  M %F0 08603 R
1693                 BCB1   *-16                                           7  04872  R 04862 2
1694                 BAI    STACHK            REPORT ANY ERROR             7  04879  R 03105 M
1695                 SD     1,ADR249          SEEK ACC TO CYL 249          10  04886  M %F0 08526 R
1696                 BCB1   *-16                                           7  04896  R 04886 2
1697                 BAI    STACHK            REPORT ANY ERROR             7  04903  R 03105 M
1698                 MU     %F5,ADR249,R      VERIFY ARRIVAL & CHECK FOR CE  10  04910  M %F5 08526 R
1699                 BCB1   *-16                                           7  04920  R 04910 2
1700                 BAI    *&1                                           7  04927  R 04934 M
1701                 BEF1   *&8               BRCH ON NO RECORD FOUND      7  04934  R 04948 8
1702                 B      CESWON                                        7  04941  J 04962
1703                 BNT1   STACHK            GO REPORT ERROR              7  04948  R 03105 S
1704                 B      GOTOCE            NO  ERROR GO TO NEXT TEST    7  04955  J 04996
1705       CESWON    BER1   *&8               CHECK FOR CE SWITCH BEING MADE  7  04962  R 04976 4
1706                 B      GOTOCE                                        7  04969  J 04996
1707                 BNT1   *&8               BRCH IF CE SWITCH WAS ON     7  04976  R 04990 S
1708                 B      GOTOCE                                        7  04983  J 04996
1709                ***  SET ERROR 2 ON  ***
1710                 SW     E2                SET ERROR IND                6  04990  . 01803
1711          CE SWITCH MADE WHEN ACCESS WAS MOVED FROM CYL 10 TO CYL 249
1712       GOTOCE    SD     1,ADR250          SEEK ADDR CYL 250            10  04996  M %F0 08614 R
1713                 BCB1   *-16                                           7  05006  R 04996 2
1714                 BAI    STACHK            REPORT ABY ERROR             7  05013  R 03105 M
1715                 MU     %F5,ADR250,R      VERIFY ARRIVAL AT CE CYL     10  05020  M %F5 08614 R
1716                 BCB1   *-16                                           7  05030  R 05020 2
```

TEST INNER CE TRACK

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1717		BA1	*&1		7	05037	R 05044 G M
1718		BEF1	*&8	CHECK FOR NO RECORD FOUND	7	05044	R 05058 8
1719		B	SWCN		7	05051	J 05072
1720		BNT1	STACHK	GO REPORT ERROR	7	05058	R 03105 S B
1721		B	COUNT1	BRCH NO ERRORS	7	05065	J 05127
1722	SWCN	BER1	*&8	CHECK FOR CE SWITCH MADE	7	05072	R 05086 4
1723		B	COUNT1		7	05079	J 05127
1724		BNT1	*&8	BRCH IF CE SWITCH MADE	7	05086	R 05100 S B
1725		B	COUNT1		7	05093	J 05127
1726	SWCN1	BER1	*&8		7	05100	R 05114 4
1727		B	*&15		7	05107	J 05128
1728		BNT1	*&7	BRCH ON NO TRANSFER	7	05114	R 05127 S B
1729		***	SET ERROR 3 ON ***				
1730		SW	E3	TURN ON ERROR IND	6	05121	, 01804
1731		CE SWITCH DID NOT MAKE WHEN ACCESS WAS MOVED TO CYL 250 FROM 249					
1732	COUNT1	A	&1&,RUTCNT		11	05127	A 08717 08653
1733		BZ	*&8	BRCH AFTER 10 PASSES	7	05138	J 05152 V
1734		B	OVRSHT		7	05145	J 04862
1735	AO1XIT	B	MONITR		7	05152	J 02101

TEST OUTER CE SWITCH DC04 PAGE 252

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PGLIN   LABEL   OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1737          THIS ROUTINE TEST THE MAKE AND BREAK OF THE OUTER CE SWITCH AND
1738        THE TIME IT TAKES THE ACCESS TO GO FROM REZERO TO CYL 0.IF THE
1739        OUTER CE SWITCH DOES NOT MAKE WHEN THE ACCESS IS FORCED TO REZERO
1740        FROM CYL 0,ERRCR 4 IS INDICATED.IF THE OUTER CE SWITCH DOES NOT
1741        BREAK WHEN IT MOVES FROM REZERO TO CYL 0 ERROR 5 IS INDICATED.THE
1742        TIME REQUIRED FOR THE ACCESS TO MOVE FROM REZERO TO CYL 0 IS
1743        RECORDED AND AFTER 10 PASSES AN AVERAGE TIME IS TYPED OUT FOR THE
1744        ACCESS MOTION AND IF THE TIME IS EXCESSIVE IT CAN INDICATE  THAT
1745        THE DETENT IS BINDING.
1746
1747   A02      NOP                                                      1  05159  N
1748            DC      @02@            ROUTINE ID                       2  05161
1749            MLCB    ADDR00&1,ADRYYY&1                                12  05162  D 08483 08626 L
1750            S       TIMCNT          RESET                            6  05174  S 08673
1751            S       AVGTME          TIME AND PASS                    6  05180  S 08678
1752            S       RUTCNT          COUNTERS                         6  05186  S 08653
1753   OUTBR    SD      1,ADDR00        POSITION ACC AT CYL 0            10  05192  M %F0 08482 R
1754            BCB1    *-16                                             7  05202  R 05192 2
1755            BA1     STACHK          REPORT ANY EROR                  7  05209  R 03105 GM
1756            MU      %F5,ADDR00,R    VERIFY ARRIVAL                   10  05216  M %F5 08482 R
1757            BCB1    *-16                                             7  05226  R 05216 2
1758            BA1     *&1                                              7  05233  R 05240 GM
1759            BEF1    *&8             CHECK FOR NO RECORD FOUND        7  05240  R 05254 8
1760            B       REZRO                                            7  05247  J 05275
1761            BNT1    *&8             BRCH IF NO RECORD FOUND          7  05254  R 05268 S8
1762            B       REZRO                                            7  05261  J 05275
1763            BA1     STACHK          GO REPORT ERROR                  7  05268  R 03105 GM
1764   REZRO    SD      1,ADRYYY        SEEK ACCESS TO REZERO            10  05275  M %F0 08625 R
1765            BCB1    *-16                                             7  05285  R 05275 2
1766            BA1     STACHK          REPORT ANY ERROR                 7  05292  R 03105 GM
1767            MU      %F5,ADDR00,R    VERIFY ACC REZEROED              10  05299  M %F5 08482 R
1768            BCB1    *-16                                             7  05309  R 05299 2
1769            BA1     *&1                                              7  05316  R 05323 GM
1770            BER1    *&8             CHECK FOR NO RECORD FOUND        7  05323  R 05337 4
1771            B       *&8                                              7  05330  J 05344
1772            BNT1    BACTOO          BRCH IF NO FECORD FOUND          7  05337  R 05362 S8
1773          *** SET ERROR 4 ON ***
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1774                SW     E4                TURN ON ERROR IND      6  05344  , 01805
1775        OUTER CE SWITCH DIC NOT MAKE WHEN ACCESS REZEROED
1776                BW     MONITR,E4         BRCH IF CE SW WAS NOT  SET  12  05350  V 02101 01805 1
1777      BACTCO    SC     1,ADDR00          SEEK DISK TO 0         10  05362  M %F0 08482 R
1778                BCB1   *-16                                     7  05372  R 05362 2
1779                BA1    *&1                                      7  05379  R 05386 G
1780      REZ020    MU     %F5,ADDR00,R      TEST BUSY LINE         10  05386  M %F5 08482 R
1781                BCB1   *&15                                     7  05396  R 05417 2
1782                BA1    *&1                                      7  05403  R 05410 M
1783                B      REZTIM                                   7  05410  J 05435
1784                A      LOOPTI,TIMCNT     ADD LOOP TIME TO ACCUMULATOR  11  05417  A 08667 08673
1785                B      REZ020                                   7  05428  J 05386
1786      REZTIM    A      CORR,TIMCNT       ADD CORRECTION FACTOR  11  05435  A 08680 08673
1787                A      TIMCNT-3,AVGTME   ADD TIME TO AVERAGE TIME ACC  11  05446  A 08670 08678
1788                BER1   *&8               CHECK FOR NO RECORD FOUND  7  05457  R 05471 4
1789                B      *&21                                     7  05464  J 05491
1790                BNT1   *&8               BRCH IF NO RECORD FOUND  7  05471  R 05485 S
1791                B      *&7                                      7  05478  J 05491
1792                ***  SET ERROR 5 ON  ***
1793                SW     E5                TURN ON ERROR IND      6  05485  , 01806
1794        OUTER CE SWITCH DIC NOT BREAK WHEN ACCESS MOVED TO CYL 0
1795                A      @12,RUTCNT        COUNT 10 PASSES        11  05491  A 08717 08653
1796                BZ     *&8               BRCH AFTER 10 PASSES    7  05502  J 05516 V
1797                B      OUTER                                    7  05509  J 05192
1798                SW     AVGTME-3                                 6  05516  , 08675
1799                MLNA   AVGTME-1,REZMSG&36 MOVE AVERAGE TIME      12  05522  D 08677 05577 /
1800                B      TYP1                                     7  05534  J 01593
1801      REZMSG    DCW    @SEEK TIME FROM REZERO TO CYL 0 IS     MSEC.@,G  43  05541
1802                CW     AVGTME-3                                 6  05585  ¤ 08675
1803      NO2XIT    B      MONITR                                   7  05591  J 02101
```

```
PGLIN    LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
1805                       *** TEST ROUTINE DESCRIPTION ***
1806                       *** TIME 50 MILLIE SEC SEEKS,CYL 0 TO CYL 9 ***
1807          THE ACCESS IS POSITIONED AT CYL 0 AND THEN SEEKED TO CYL 9,THE
1808        ACCESS IS ISSUED ANOTHER SEEK AND THE BUSY LINE IS CHECKED.AS
1809        LONG AS THE BUSY LINE REMAINS UP THE PROGRAM STAYS IN A TIMING
1810        LOOP.WHEN BUSY DROPS THE PROGRAM STORES THE TIME THE BUSY LINE
1811        WAS UP AND REPEATS THE ROUTINE.AFTER 10 PASSES THE AVERAGE TIME
1812        IS STORED AND THE PROGRAM GOES TO THE NEXT ROUTINE.STATUS INDICAT
1813        ORS TURNED ON WILL BE INDICATED
1814
1815      NO6         NOP                                                    1  05598  N
1816                  DC          @06@              ROUTINE ID               2  05600
1817                  S           TIMCNT                                     6  05601  S 08673
1818                  S           AVGTME            RESET COUNTERS           6  05607  S 08678
1819                  S           RUTCNT                                     6  05613  S 08653
1820                  MLCB        ADDR00&1,ADDR9&1                          12  05619  D 08483 08494 L
1821      ZERO29      SC          1,ADDR00          RESET ACCESS             10  05631  M %F0 08482 R
1822                  BCB1        *-16                                       7  05641  R 05631 2
1823                  BA1         STACHK            BRCH ON ANY ERROR        7  05648  R 03105 M
1824                  SC          1,ADDR9           SEEK ACCESS TO CYL 9      10  05655  M %F0 08493 R
1825                  BCB1        *-16                                       7  05665  R 05655 2
1826                  BA1         STACHK            BRCH ON ANY ERROR        7  05672  R 03105 M
1827      SHORT       SC          1,ADDR9           TRY ANOTHER SEEK         10  05679  M %F0 08493 R
1828                  BCB1        *&15              BRCH BUSY                 7  05689  R 05710 2
1829                  BA1         STACHK            BRCH ON ANY ERROR        7  05696  R 03105 M
1830                  B           FIFTY                                      7  05703  J 05728
1831                  A           LOOPTI,TIMCNT     ADD LOOP TIME TO         11  05710  A 08667 08673
1832                  B           SHORT               TOTAL SEEK TIME         7  05721  J 05679
1833      FIFTY       A           CORR,TIMCNT                                11  05728  A 08680 08673
1834                  A           TIMCNT-3,AVGTME   ADD                      11  05739  A 08670 08678
1835                  S           TIMCNT            RESET TIME ACCUMULATOR    6  05750  S 08673
1836                  A           @1@,RUTCNT        ADD 1 TO PASS COUNT      11  05756  A 08717 08653
1837                  BZ          *&8               BRCH AFTER 10 PASSES      7  05767  J 05781 V
1838                  B           ZERO29                                     7  05774  J 05631
1839                  SW          AVGTME-3                                   6  05781  , 08675
1840                  MLNA        AVGTME-1,OUT10&20 MOVE AVERAGE TIME        12  05787  D 08677 07442 /
1841                  CW          AVGTME-3                                   6  05799  ¤ 08675
```

TIME 50 MILLI SEC SEEKS CYL 0 TO CYL 9

PGLIN	LABBL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
1842	NO6XIT	B	MONITR	7	05805	J 02101

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1844		THIS ROUTINE TIMES ACCESS MOTION BETWEEN CYL 0 AND CYL 10,WHICH					
1845		CAUSE THE 10 PISTON TO BE ACTUATED.THE SEEK TIMES ARE STORED FOR					
1846		10 PASSES AND AN AVERAGE SEEK TIME IS RECORDED.ANY STATUS ERRORS					
1847		WILL BE INDICATED.					
1848							
1849	NO3	NCP			1	05812	N
1850		DC	@03@	ROUTINE ID	2	05814	
1851		MLCB	ADDR00&1,ADDR10&1		12	05815	D 08483 08505 L
1852		S	TIMCNT	RESET	6	05827	S 08673
1853		S	AVGTME	TIME & PASS	6	05833	S 08678
1854		S	RUTCNT	COUNTERS	6	05839	S 08653
1855	TO10	SC	1,ADDR00	POSITION ACC AT CYL 0	10	05845	M %F0 08482 R
1856		BCB1	*-16		7	05855	R 05845 2 G M
1857		BA1	STACHK	REPORT ANY ERROR	7	05862	R 03105
1858		SC	1,ADDR10	SEEK ACC TO CYL 10	10	05869	M %F0 08504 R
1859		BCB1	*-16		7	05879	R 05869 2 G M
1860		BA1	STACHK	REPORT ANY ERROR	7	05886	R 03105
1861	ZERO10	SC	1,ADDR10	FORCE BUSY ON	10	05893	M %F0 08504 R
1862		BCB1	*&15	BRCH ON BUSY	7	05903	R 05924 2 G M
1863		BA1	STACHK	REPORT ANY ERROR	7	05910	R 03105
1864		B	INTEN		7	05917	J 05942
1865		A	LOCPTI,TIMCNT	ADD LOOP TIME TO ACCUMULATOR	11	05924	A 08667 08673
1866		B	ZERO10		7	05935	J 05893
1867	INTEN	A	CORR,TIMCNT	ADD CORRECTION FACTOR	11	05942	A 08680 08673
1868		A	TIMCNT-3,AVGTME	ADD	11	05953	A 08670 08678
1869		S	TIMCNT		6	05964	S 08673
1870		A	@1@,RUTCNT	ADD ONE TO PASS COUNT	11	05970	A 08717 08653
1871		BZ	*&8	BRCH AFTER 10 PASSES	7	05981	J 05995 V
1872		B	TO10		7	05988	J 05845
1873		SW	AVGTME-3		6	05995	, 08675
1874		MLNA	AVGTME-1,OUT11&20	MOVE AVERAGE TIME	12	06001	D 08677 07481 /
1875		CW	AVGTME-3		6	06013	¤ 08675
1876	NO3XIT	B	MONITR		7	06019	J 02101

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1878			*** TEST ROUTINE DESCRIPTION ***				
1879			*** TIME 110 MILLI SEC SEEKS,CYL 0 TO CYL 49 ***				
1880			WITH THE ACCESS POSITIONED AT CYL 0,A SEEK TO CYL 49 IS ISSUED				
1881			FOLLOWED BY A 2ND SEEK TO CYL 49.THE PROGRAM TIMES THE DURATION				
1882			OF THE BUSY FROM THE 1ST SEEK TO CYL 49,WHEN BUSY DROPS THE PROG-				
1883			RAM STORES THE TIME AND REPEATS THE ROUTINE.AFTER 10 PASSES THE				
1884			AVERAGE SEEK TIME IS STORED AND THE NEXT ROUTINE IS RUN.ANY				
1885			STATUS ERRORS WILL BE INDICATED.				
1886							
1887	NO7	NOP			1	06026	N
1888		DC	@07@	ROUTINE ID	2	06028	
1889		MLCB	ADDR00&1,ADDR49&1		12	06029	D 08483 08538 L
1890		S	TIMCNT	RESET TIME COUNT	6	06041	S 08673
1891		S	AVGTME	RESET COUNTERS	6	06047	S 08678
1892		S	RUTCNT	RESET COUNTERS	6	06053	S 08653
1893	ZERO40	SD	1,ADDR00	RESET ACCESS	10	06059	M %F0 08482 R
1894		BCB1	*-16		7	06069	R 06059 2
1895		BA1	STACHK	BRCH ON ANY ERROR	7	06076	R 03105 G M
1896		SD	1,ADDR49	SEEK TO CYL 49	10	06083	M %F0 08537 R
1897		BCB1	*-16		7	06093	R 06083 2
1898		BA1	STACHK	BRCH ON ANY ERROR	7	06100	R 03105 G M
1899	MEDIUM	SD	1,ADDR49		10	06107	M %F0 08537 R
1900		BCB1	*&15	BRCH BUSY	7	06117	R 06138 2
1901		BA1	STACHK	BRCH ON ANY ERROR	7	06124	R 03105 G M
1902		B	ONE1C		7	06131	J 06156
1903		A	LOOPTI,TIMCNT	ADD LOOP TIME TO	11	06138	A 08667 08673
1904		B	MEDIUM	TOTAL SEEK TIME	7	06149	J 06107
1905	ONE1C	A	CORR,TIMCNT	ADD CORRECTION	11	06156	A 08680 08673
1906		A	TIMCNT-3,AVGTME	ADD TIME TO AVERAGE ACC	11	06167	A 08670 08678
1907		S	TIMCNT		6	06178	S 08673
1908		A	@1@,RUTCNT	ADD 1 TO PASS COUNT	11	06184	A 08717 08653
1909		BZ	*&8	BRCH AFER 10 PASSES	7	06195	J 06209 V
1910		B	ZERO40		7	06202	J 06059
1911		SW	AVGTME-3		6	06209	, 08675
1912		MLNA	AVGTME-1,OUT50&20	MOVE AVERAGE TIME	12	06215	D 08677 07520 /
1913		CW	AVGTME-3		6	06227	¤ 08675
1914	NO7XIT	B	MONITR		7	06233	J 02101

TIME 110 MILLI SEC SEEKS CYL 0 TO CYL49

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION

```
PGLIN   LABEL    OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1916                    *** TEST ROUTINE DESCRIPTION ***
1917       THE ACCESS IS POSITIONED AT CYL 0,IT IS THEN SEEKED TO CYL 100,
1918       THIS IS FOLLOWED BY A SECOND SEEK TO CYL 100.THE BUSY LINE IS
1919       TIMED AND WHEN IT FALLS THE PROGRAM STORES THE TOTAL TIME BUSY
1920       WAS UP AND REPEATS THE ROUTINE.AFTER 10 PASSES THE AVERAGE TIME
1921       IS STORED AND THE PROGRAM PROGRESSES TO THE NEXT ROUTINE.ANY
1922       STATUS ERRORS WILL BE INDICATED.
1923
1924    A08     NOP                                               1  06240  N
1925            DC      @08@              ROUTINE ID              2  06242
1926            MLCB    ADDR00&1,ADR100&1                        12  06243  D 08483 08516 L
1927            S       TIMCNT            RESET TIME COUNT        6  06255  S 08673
1928            S       AVGTME            RESET COUNTERS          6  06261  S 08678
1929            S       RUTCNT            RESET COUNTERS          6  06267  S 08653
1930    TO10C   SC      1,ADDR00          RESET ACCESS           10  06273  M %F0 08482 R
1931            BCB1    *-16                                      7  06283  R 06273 2G
1932            BA1     STACHK            BRCH ON ANY ERROR       7  06290  R 03105 M
1933            SC      1,ADR100          SEEK ACC TO CYL 100    10  06297  M %F0 08515 R
1934            BCB1    *-16                                      7  06307  R 06297 2G
1935            BA1     STACHK            BRCH ON ANY ERROR       7  06314  R 03105 M
1936    LONG    SC      1,ADR1CO          TRY ANOTHER SEEK       10  06321  M %F0 08515 R
1937            BCB1    *&15                                      7  06331  R 06352 2G
1938            BA1     STACHK            BRCH ON ANY ERROR       7  06338  R 03105 M
1939            B       ONE85                                     7  06345  J 06370
1940            A       LOCPT1,TIMCNT     ADD LOOP TIME TO       11  06352  A 08667 08673
1941            B       LONG                TOTAL SEEK TIME       7  06363  J 06321
1942    ONE85   A       CORR,TIMCNT       ADD CORRECTION         11  06370  A 08680 08673
1943            A       TIMCNT-3,AVGTME   ADD TIME TO AVERAGE TIME ACC 11  06381  A 08670 08678
1944            S       TIMCNT                                    6  06392  S 08673
1945            A       @1@,RUTCNT        ADD 1 TO PASS COUNT    11  06398  A 08717 08653
1946            BZ      *&8               BRCH AFTER 10 PASSES    7  06409  J 06423 V
1947            B       TO100                                     7  06416  J 06273
1948            SW      AVGTME-3                                  6  06423  , 08675
1949            MLNA    AVGTME-1,OUT100&20 MOVE AVERAGE TIME     12  06429  D 08677 07559 /
1950            CW      AVGTME-3          P                       6  06441  ¤ 08675
1951    A08XIT  B       MONITR                                    7  06447  J 02101
1952
```

TIME 180 MILLI SEC SEEK CYL 0 TO 100

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1954          THIS ROUTINE AGAIN TIMES 50 MILLI SECOND SEEKS EXCEPT THAT THE
1955          ACCESS MOTION IS TIMED FROM CYL 9 OUTWARD TO CYL 0.AN AVERAGE OF
1956          10 SEEKS IS RECORDED.
1957
1958      NO9       NOP                                              1  06454  N
1959                DC     @09@              ROUTINE ID              2  06456
1960                MLCB   ADDR00&1,ADDR9&1                         12  06457  D 08483 08494 L
1961                S      TIMCNT            RESET TIME COUNT        6  06469  S 08673
1962                S      AVGTME            RESET COUNTERS          6  06475  S 08678
1963                S      RUTCNT                                    6  06481  S 08653
1964      NINE20    SD     1,ADDR9           POSITION ACCESS AT CYL 9 10  06487  M %F0 08493 R
1965                BCB1   *-16                                      7  06497  R 06487 2
1966                BA1    STACHK            BRCH ON ANY ERROR       7  06504  R 03105 G M
1967                SD     1,ADDR00          SEEK ACC TO CYL 0       10  06511  M %F0 08482 R
1968                BCB1   *-16                                      7  06521  R 06511 2
1969                BA1    STACHK            BRCH ON ANY ERROR       7  06528  R 03105 G M
1970      SMALL     SD     1,ADDR00          POSITION ACC AT CYL 0   10  06535  M %F0 08482 R
1971                BCB1   *&15                                      7  06545  R 06566 2
1972                BA1    STACHK            BRCH ON ANY ERROR       7  06552  R 03105 G M
1973                B      FIVE0                                     7  06559  J 06584
1974                A      LOOPTI,TIMCNT     ADD LOOP TIME TO        11  06566  A 08667 08673
1975                B      SMALL              TOTAL SEEK TIME        7  06577  J 06535
1976      FIVE0     A      CORR,TIMCNT       ADD CORRECTION          11  06584  A 08680 08673
1977                A      TIMCNT-3,AVGTME   ADD TIME TO AVERAGE     11  06595  A 08670 08678
1978                S      TIMCNT                                    6  06606  S 08673
1979                A      @1@,RUTCNT        ADD 1 TO PASS COUNT     11  06612  A 08717 08653
1980                BZ     *&8               BRCH AFTER 10 PASSES    7  06623  J 06637 V
1981                B      NINE20                                    7  06630  J 06487
1982                SW     AVGTME-3                                  6  06637  , 08675
1983                MLNA   AVGTME-1,OFF10&20 MOVE AVERAGE TIME        12  06643  D 08677 07598 /
1984                CW     AVGTME-3                                  6  06655  ¤ 08675
1985      NO9XIT    B      MONITR                                    7  06661  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1987          AGAIN 120 MILLISEC SEEKS ARE TIMED,EXCEPT THE ACCESS MOTION IS
1988           OUTWARD FROM CYL 10 TO CYL 0 IN THIS ROUTINE.AN AVERAGE OF 10
1989          SEEK TIMES IS RECORDED.
1990
1991      N16       NOP                                              1  06668  N
1992                CC      @16@                                     2  06670
1993                MLCB    ADDR00&1,ADDR10&1                       12  06671  D 08483 08505 L
1994                S       TIMCNT          RESET COUNTERS           6  06683  S 08673
1995                S       AVGTME          RESET COUNTERS           6  06689  S 08678
1996                S       RUTCNT          RESET COUNTERS           6  06695  S 08653
1997      FROM10    SD      1,ADDR10        POSITION ACC AT CYL 10  10  06701  M %F0 08504 R
1998                BCB1    *-16                                     7  06711  R 06701 2G
1999                BA1     STACHK          REPORT ERRORS            7  06718  R 03105 M
2000                SD      1,ADDR00        SEEK ACC TO CYL 0       10  06725  M %F0 08482 R
2001                BCB1    *-16                                     7  06735  R 06725 2G
2002                BA1     STACHK          REPORT ANY ERROR         7  06742  R 03105 M
2003      TEN20     SD      1,ADDR00        SEEK ACC TO CYL 0       10  06749  M %F0 08482 R
2004                BCB1    *&15            BRCH ON BUSY             7  06759  R 06780 2G
2005                BA1     STACHK          REPORT ANY ERRORS        7  06766  R 03105 M
2006                B       OUTTEN                                   7  06773  J 06798
2007                A       LOCPTI,TIMCNT   ADD LOOP TIME TO ACCUMULATOR 11  06780  A 08667 08673
2008                B       TEN20                                    7  06791  J 06749
2009      OUTTEN    A       CORR,TIMCNT     ADD CORRECTION FACTOR   11  06798  A 08680 08673
2010                A       TIMCNT-3,AVGTME ADD TIME TO AVERAGE TIME ACC 11  06809  A 08670 08678
2011                S       TIMCNT                                   6  06820  S 08673
2012                A       @1@,RUTCNT      ADD 1 TO PASS COUNTER   11  06826  A 08717 08653
2013                BZ      *&8             BRCH AFTER 10 PASSES     7  06837  J 06851 V
2014                B       FRCM10                                   7  06844  J 06701
2015                SW      AVGTME-3                                 6  06851  , 08675
2016                MLNA    AVGTME-1,OFF11&20                       12  06857  D 08677 07637 /
2017                CW      AVGTME-3                                 6  06869  ¤ 08675
2018      N16XIT    B       MONITR                                   7  06875  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

2020            ACCESS MOTION IS TIMED FROM CYL 40 TO 0 IN THIS ROUTINE,AN AVER
2021              AGE OF 10 SEEKS IS RECORDED.
2022      N1C     NOP                                               1  06882  N
2023              DC      @1C@              ROUTINE ID              2  06884
2024              MLCB    ADDR00&1,ADDR49&1                        12  06885  D 08483 08538 L
2025              S       TIMCNT            RESET TIME COUNT        6  06897  S 08673
2026              S       AVGTME            RESET COUNTERS          6  06903  S 08678
2027              S       RUTCNT            RESET COUNTERS          6  06909  S 08653
2028      BACK40  SD      1,ADDR49          POSITION ACC AT CYL 40 10  06915  M %F0 08537 R
2029              BCB1    *-16                                      7  06925  R 06915 2
                                                                                 G
2030              BA1     STACHK            BRCH ON ANY ERROR       7  06932  R 03105 M
2031              SD      1,ADDR00          SEEK ACC TO CYL 0      10  06939  M %F0 08482 R
2032              BCB1    *-16                                      7  06949  R 06939 2
                                                                                 G
2033              BA1     STACHK            BRCH ON ANY ERROR       7  06956  R 03105 M
2034      BIG     SD      1,ADDR00          FORCE BUSY ON          10  06963  M %F0 08482 R
2035              BCB1    *&15              BRCH BUSY               7  06973  R 06994 2
                                                                                 G
2036              BA1     STACHK            BRCH ON ANY ERROR       7  06980  R 03105 M
2037              B       ONETEN                                    7  06987  J 07012
2038              A       LOCPTI,TIMCNT     ADD LOOP TIME TO       11  06994  A 08667 08673
2039              B       BIG                TOTAL SEEK TIME        7  07005  J 06963
2040      ONETEN  A       CORR,TIMCNT       ADD CORRECTION         11  07012  A 08680 08673
2041              A       TIMCNT-3,AVGTME   ADD TIME TO AVERAGE TIME ACC 11  07023  A 08670 08678
2042              S       TIMCNT                                    6  07034  S 08673
2043              A       @1@,RUTCNT        ADD 1 TO PASS COUNTER  11  07040  A 08717 08653
2044              BZ      *&8               BRCH AFTER 10 PASSES    7  07051  J 07065 V
2045              B       BACK40                                    7  07058  J 06915
2046              SW      AVGTME-3                                  6  07065  , 08675
2047              MLNA    AVGTME-1,OFF50&20                        12  07071  D 08677 07676 /
2048              CW      AVGTME-3                                  6  07083  ¤ 08675
2049      N1CXIT  B       MONITR                                    7  07089  J 02101
2050
```

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
2052			ACCESS MOTION IS TIMED FROM CYL 100 TO 0 IN THIS ROUTINE,AN AVER				
2053			AGE OF 10 SEEKS IS RECORDED.				
2054							
2055	N11	NOP			1	07096	N
2056		DC	@11@	ROUTINE ID	2	07098	
2057		MLCB	ADDR00&1,ADR100&1		12	07099	D 08483 08516 L
2058		S	TIMCNT	RESET TIME COUNT	6	07111	S 08673
2059		S	AVGTME	RESET COUNTERS	6	07117	S 08678
2060		S	RUTCNT	RESET COUNTERS	6	07123	S 08653
2061	BAC1C0	SD	1,ADR100	POSITION ACC AT CYL 100	10	07129	M %F0 08515 R
2062		BCB1	*-16		7	07139	R 07129 2
2063		BA1	STACHK	BRCH ON ANY ERROR	7	07146	R 03105 G M
2064		SC	1,ADDR00	SEEK TO CYL 000	10	07153	M %F0 08482 R
2065		BCB1	*-16		7	07163	R 07153 2
2066		BA1	STACHK	BRCH ON ANY ERROR	7	07170	R 03105 G M
2067	LARGE	SC	1,ADDR00	TRY AGAIN	10	07177	M %F0 08482 R
2068		BCB1	*&15	BRCH BUSY	7	07187	R 07208 2
2069		BA1	STACHK	BRCH ON ANY ERROR	7	07194	R 03105 G M
2070		B	ONE80		7	07201	J 07226
2071		A	LOOPTI,TIMCNT	ADD LOOP TIME TO	11	07208	A 08667 08673
2072		B	LARGE	TOTAL SEEK TIME	7	07219	J 07177
2073	ONE8C	A	CORR,TIMCNT	ADD CORRECTION	11	07226	A 08680 08673
2074		A	TIMCNT-3,AVGTME	ADD TIME TO AVERAGE	11	07237	A 08670 08678
2075		S	TIMCNT		6	07248	S 08673
2076		A	@1@,RUTCNT	ADD 1 TO PASS COUNTER	11	07254	A 08717 08653
2077		BZ	*&8	BRCH AFTER 10 PASSES	7	07265	J 07279 V
2078		B	BAC100		7	07272	J 07129
2079		SW	AVGTME-3		6	07279	, 08675
2080		MLNA	AVGTME-1,OFF100&20	ADD AVERAGE TIME TO TYPE OUT	12	07285	D 08677 07715 /
2081		CW	AVGTME-3		6	07297	¤ 08675
2082	N11XIT	B	MONITR		7	07303	J 02101
2083							

```
                    TYPE SEEK TIME RESULTS
PGLIN     LABEL     OPCOD  OPERAND                                                    DC04          PAGE 265
                                                                                   CT  ADDRS  INSTRUCTION

2085                   *** TEST ROUTINE DESCRIPTION ***
2086                *** TYPE SEEK TIME RESULTS ***
2087          USING THE RESULTS STORED BY THE SIX TIMING ROUTINES,A TABLE IS
2088          COMPILED AND TYPED OUT.
2089
2090      N12         NCP                                                             1  07310  N
2091                  DC      @12@                ROUTINE ID                          2  07312
2092                  B       TYP1                                                    7  07313  J 01593
2093                  DCW     @THE FOLLOWING ARE AVERAGE TIMES FOR TEN SEEKS@,G      45  07364
2094                  B       TYP1                                                    7  07366  J 01593
2095                  DCW     @SEEK FROM TC TIME WAS,SHOULD BE (L)BIN MSEC(R)@,G     41  07413
2096                  B       TYP1                                                    7  07415  J 01593
2097      OUT10       DCW     @       0000 0360           50@,G                      31  07422
2098                  B       TYP1                                                    7  07454  J 01593
2099      OUT11       DCW     @       0000 0400           120@,G                     31  07461
2100                  B       TYP1                                                    7  07493  J 01593
2101      OUT50       DCW     @       0000 1600           120@,G                     31  07500
2102                  B       TYP1                                                    7  07532  J 01593
2103      OUT100      DCW     @       0000 4000           180@,G                     31  07539
2104                  B       TYP1                                                    7  07571  J 01593
2105      OFF10       DCW     @       0360 0000           50@,G                      31  07578
2106                  B       TYP1                                                    7  07610  J 01593
2107      OFF11       DCW     @       0400 0000           120@,G                     31  07617
2108                  B       TYP1                                                    7  07649  J 01593
2109      OFF50       DCW     @       1600 0000           120@,G                     31  07656
2110                  B       TYP1                                                    7  07688  J 01593
2111      OFF100      DCW     @       4000 0000           180@,G                     31  07695
2112      N12XIT      B       MONITR                                                  7  07727  J 02101
2113
```

UPDATE CHANNEL & MODULE ROUTINE

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
2115			*** TEST ROUTINE DESCRIPTION ***				
2116			*** UPDATE CHANNEL & MODULE ROUTINE ***				
2117			THIS ROUTINE STARTS WITH MODULE 0 ON CHANNEL 1 AND TESTS FOR A				
2118			READY FILE,WHEN A READY FILE IS LOCATED THE PROGRAM IS ALTERED				
2119			ACCORDING TO THE CHANNEL THE FILE IS ON.THE ROUTINE TYPES OUT THE				
2120			MODULE AND CHANNEL NUMBER FOR EACH FILE FOUND READY.				
2121							
2122	N13	NOP					
2123		DC	@13@	ROUTINE ID	1	07734	N
2124		B	POP&7		2	07736	
2125		BCE	*&8,0&X1C,F	FILES ON THIS CHNL	7	07737	J 07826
2126		B	UPCHNL	GO UPDATE FOR NEXT	12	07744	B 07763 00..0 F
2127		MLCA	CODE3&X15,INCODE	MOVE CHANNEL CODES	7	07756	J 07893
2128		B	CHALTR	GO TO CHANNEL ALTER	12	07763	D 08FH7 07794 T
2129		DCW	TOP	HIGH LIMIT	7	07775	J 01045
2130		DC	BOTTOM	LOW LIMIT	5	07786	08330
2131		DCW	@ @		5	07791	03810
2132		DC	@ @		1	07792	
2133	INCODE	DC	@ @		1	07793	
2134	RDYFIL	SD	1,ADDR00	SEEK THE ACCESS	1	07794	
2135		BNR1	*&15	BRCH NOT READY	10	07795	M &F0 08482 R
2136		BA1	*&1		7	07805	R 07826 1
2137	POP	B	GOTIT		7	07812	R 07819 G M
2138		A	@1@,ADDR00		7	07819	J 07940
2139		BCE	*&8,ADDR00,2	BRCH IF ACCESS ADDRESS IS 0	11	07826	A 08717 08482
2140		B	RDYFIL		12	07837	B 07856 08482 2
2141		S	ADDR00	RESET ACC ADDR	7	07849	J 07795
2142		SW	ADDR00&1		6	07856	S 08482
2143		A	@1@,ADDR00&1	UPDATE MOD ADDR	6	07862	. 08483
2144		BZ	*&8	BRCH IF TEN MOD TRID	11	07868	A 08717 08483
2145		B	RDYFIL		7	07879	J 07893 V
2146	UPCHNL	A	&57@,X10	UPDATE	7	07886	J 07795
2147		A	@3@,X15	UPDATE IX 15	11	07893	A 08750 00074
2148		CW	NUCHL&1		11	07904	A 08723 00099
2149		BCE	ENDTST,X15-1,1	BRCH IF ALL CHANNELS TRIED	6	07915	¤ 03753
2150		B	N13&10	GO SEARCH FOR RDY MD	12	07921	B 08028 00098 1
2151	GOTIT	MLNS	ADDR00&1,RDYMSG&8	MOVE MOD ADDR	7	07933	J 07744
					12	07940	D 08483 07991 1

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2152                MLNS   INCODE,RDYMSG&12   MOVE CHANNEL NUMBER  12  07952  D 07794 07995 1
2153                MLNS   ADDR00,RDYMSG&18                         12  07964  D 08482 08001 1
2154                B      TYP1                                      7  07976  J 01593
2155      RDYMSG    DCW    @TST MOD  C4  ACC  @,G                   19  07983
2156                ZA     &N14,X3          LOAD IX 3                11  08003  M 08755 00039
2157                B      0&X3                                      7  08014  J 000M0
2158      N13XIT    B      MONITR                                    7  08021  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION

2160                *** END TEST ROUTINE
2161      ENDTST    B      TYP1                                        7  08028  J 01593
2162                DCW    @PASS@,G                                    4  08038
2163                BCE    20C0,TA03,1        BRCH IF REPEATING       12  08040  B 02000 01003 1
2164                B      40C                GO TO LOADER             7  08052  J 00400
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2166          THIS ROUTINE ALLOWS THE CE TO SEEK BETWEEN ANY 2 ADDRESSES ON
2167        ANY ACCESS AND MODULE HE SELECTS.THE ROUTINE IS ENTERED BY ENTER
2168        ING 8 ON THE CONSOLE.THE ROUTINE IS LEFT BY PRESSING INQUIRY AND
2169        SELECTING ANY CONTROL OPTION.WHILE THE ROUTINE IS RUNNING THE
2170        SEEK TIME FROM THE SELECTED ADDRESS TO THE SELECTED ADDRESS IS
2171        RECORDED AND THE AVERAGE TIME IS TYPED OUT EVERY 100 PASSES.THIS
2172        SHOULD ALLOW THE CE TO MAKE ADJUSTMENTS USING THE PROGRAM AS THE
2173        TIMING TOOL.
2174
2175      N15       NOP                                                      1  08059  N
2176                DC      @15@                ROUTINE ID                   2  08061
2177                B       TYP2                GO REQUEST ADDRESSES         7  08062  J 01607
2178                DCW     @ENTER 16 DIGITS,8 DIGIT FROM ADDR AND 8 DIGIT TO @  49  08117
2179                DC      @ADDR@,G                                         4  08121
2180      SLTED     DCW     @                   @,G                          16  08138  G
2181                ZA      &N15,X3             LOAD IX 3                    11  08140  M 08760 00039
2182                S       COUNT               RESET 100 COUNT              6  08151  S 08664
2183                S       AVGTME              RESET AVERAGE TIME COUMTER   6  08157  S 08678
2184      CNTEST    S       TIMCNT              RESET TIME ACCUMULATOR       6  08163  S 08673
2185                MLCA    SLTED-8,FRMADR&7    SET FROM ADDR SELECTED       12  08169  D 08130 08588 T
2186                MRCG    SLTED-7,TOADDR      SET TO ADDR SELECTED         12  08181  D 08131 08592 $
2187                SC      1,FRMADR            POSITION ACCESS AT FROM ADDR 10  08193  M %FO 08581 R
2188                BCB1    *-16                                             7  08203  R 08193 2G
2189                BAI     STACHK              REPORT ANY ERROR             7  08210  R 03105 M
2190                SC      1,TOADDR            SEEK ACCESS TO THE TO ADDR   10  08217  M %FO 08592 R
2191                BCB1    *-16                                             7  08227  R 08217 2G
2192                BAI     STACHK              REPORT ANY ERROR             7  08234  R 03105 M
2193      CTLDSK    SC      1,TOADDR            TEST ACCESS FOR BISY         10  08241  M %FO 08592 R
2194                BCB1    *&15                CHECK THE BUSY LINE          7  08251  R 08272 2G
2195                BAI     STACHK                                           7  08258  R 03105 M
2196                B       CTLTME                                           7  08265  J 08290
2197                A       LOOPTI,TIMCNT       ADD LOOP TIME TO TIME ACC    11  08272  A 08667 08673
2198                B       CTLDSK                                           7  08283  J 08241
2199      CTLTME    A       CORR,TIMCNT         ADD CORRECTION FACTOR        11  08290  A 08680 08673
2200                A       TIMCNT-3,AVGTME     ADD TIME TO AVERAGE TIME ACC 11  08301  A 08670 08678
2201                A       @1@,COUNT           COUNT 100 PASSESS            11  08312  A 08717 08664
2202                BZ      *&8                                              7  08323  J 08337 V
```

```
PGLIN   LABEL    OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION
22C3    TOP      B      CNTEST              GO TIME ANOTHER SEEK    7  08330  J 08163
22C4             MLNA   AVGTME-2,AVGMSG&25 MOVE AVERAGE SEEK TIME 12  08337  D 08676 08381 /
22C5             B      TYP1                                        7  08349  J 01593
22C6     AVGMSG  DCW    @AVERAGE TIME,100 SEEKS     MSEC@,G        31  08356
                                                                   Q
22C7     N15XIT  ZA     ENC4,X2                                    11  08388  M 08765 00034
22C8             BNQ    PRGCTL                                      7  08399  J 02273 Q
22C9             B      SLTED&2                                     7  08406  J 08140
```

```
PGLIN   LABEL   OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION
2211            *** PREPARE ONE INSTRUCTION LOOP ***
2212    PREP    B      TYP1                                        7  08413  J 01593
2213            DCW    @ONE INST. LOOP OPTION NOT AVAILABLE@      35  08454
2214            DC     @,TRY ANOTHER OPTION@,G                    19  08473
2215            B      ARGCTL                                      7  08475  J 02273
2216
```

RGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
2218		*** PROGRAM CONSTANTS ***					
2219	ADDR00	DCW	@000000088@,G	FILE	8	08482	
2220		DCW	@ @,G	ADDRESSES	1	08491	
2221	ADDR9	DCW	@000360888@,G	USED	8	08493	
2222		DCW	@ @,G	IN	1	08502	
2223	ADDR10	DCW	@000400888@,G		8	08504	
2224		DCW	@ @,G		1	08513	
2225	ADR100	DCW	@004000888@,G		8	08515	
2226		DCW	@ @,G		1	08524	
2227	ADR249	DCW	@009960888@,G		8	08526	
2228		DCW	@ @,G		1	08535	
2229	ADDR49	DCW	@001600888@,G		8	08537	
2230		DCW	@ @,G		1	08546	
2231	ADR125	DCW	@005000888@,G		8	08548	
2232		DCW	@ @,G		1	08557	
2233	ADR000	DCW	@000000008@,G		8	08559	
2234		DCW	@ @,G		1	08568	
2235	REZADR	DCW	@009@80888@,G		8	08570	
2236		DCW	@ @,G		1	08579	
2237	FRMADR	DCW	@000000008@,G		8	08581	
2238		DCW	@ @,G		1	08590	
2239	TOADDR	DCW	@000000008@,G		8	08592	
2240		DCW	@ @,G		1	08601	
2241	ADRXXX	DCW	@000400888@,G		8	08603	
2242		DCW	@ @,G		1	08612	
2243	ADR250	DCW	@009#20888@,G		8	08614	
2244		DCW	@ @,G		1	08623	
2245	ADRYYY	DCW	@009@80888@,G		8	08625	
2246		DCW	@ @,G		1	08634	
2247	VARIAD	DCW	@000000888@,G		8	08636	
2248	VARFLD	DCW	@00000000@,G		7	08645	
2249	RUTENT	DCW	@ @		1	08653	
2250	BLANK	DCW	@ @,G		4	08657	
2251	TOTIME	DCW	@ @		4	08662	
2252	COUNT	DCW	@ @		2	08664	
2253	LOOPTI	DCW	@00@		3	08667	
2254	TIMCNT	DCW	@0000000@		6	08673	

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
2255	AVGTPE	DCW	@0C0008	5	08678	
2256	CORR	DCW	@0C@	2	08680	
2257	MARKOT	DCW	@0008	3	08683	
2258	LNGCNT	DCW	@03	1	08684	
2259	CODE3	DCW	@%R1@	3	08687	
2260		DCW	@@X2@	3	08690	
2261		DCW	@M33@	3	08693	
2262		DCW	@.14@	3	08696	
2263	LOCPX	DCW	@2C1@	3	08699	
2264	CORRX	DCW	@24@	2	08701	
2265	LOCPI	DCW	@316@	3	08704	
2266	CORRI	DCW	@6E@	2	08706	
2267	LOCPC	DCW	@355@	3	08709	
2268	CORRC	DCW	@76@	2	08711	
2269		END	2000			J02000
2269			@N@	1	08712	
2269			@$@	1	08713	
2269			@C L@	1	08714	
2269			@G M@	1	08715	
2269			@ @	1	08716	
2269			@1@	1	08717	
2269			@0C209@	5	08722	
2269			@3@	1	08723	
2269			@7@	1	08724	
2269			@0C237@	5	08729	
2269			@2@	1	09730	
2269			@01332@	5	08735	
2269			@0C000@	5	08740	
2269			@0315@	4	08744	
2269			@7777@	4	08748	
2269			@57@	2	08750	
2269			N14	5	08755	03749
2269			N15	5	08760	08059
2269			N04	5	08765	04365

END OF ASSEMBLY

6.26.00 SUMMARY

26.01 System & Channel Cards

The System & Channel Cards are numbered
001 - System Card
002 thru 005 - Channel 1 thru Channel 4 in each of the DC series program decks.

26.02 Standard TADS 0-3

The Standard TADS for the "DC" Series are defined as follows:

Location		Not $\bar{1}$	$\bar{1}$
1000	TAD 0	Allow Error Typeout	Bypass Error Typeout
1001	TAD 1	Do Not Reg Action	Reg Action
1002	TAD 2	Not Used	Not Used
1003	TAD 3	One Prog. Pass	Repeat Prog.

The Standard TADS are set to $\bar{1}$ when the program is loaded.

26.03 Program Control Options

The following options are available in all the "DC" Series programs through the Console

Enter	To	Also Enter
0	Terminate Test	Nothing
1	Reset all Standard Tads	Four new Tads (1 or $\bar{1}$)
2	Alter Memory	Five Digit Memory Addr
3	Alter Routine Seq	Routine Numbers in order desired
4	Loop a Routine	Starting Address of Routine to be looped
5	Loop an instruction	See Package Write Up
6	Restart at desired loc.	Starting Memory Address
7	Continue from point of Inter.	Nothing

26.04 Auto Restart

If the Check Control Switch is set to Reset & Restart for any "DC" program it will automatically continue after a machine alarm.

26.05 Manual Restart

Press computer Reset & Start after any machine alarm or stop, the program will continue.

26.06 Loading Procedure

Reference Vol. 1 for Diagnostic Loading Procedures

26.07 Error Typeout Format

All error messages will be given on the typewriter in the following format.

A. "Routine N00" Defines failing routine number

B. "*Error 00 00000 M%F0 00000R 1248AB"

- "*Error" — Error Flag
- 00 — Error No.
- 00000 — Starting Addr of Rout
- M%F0 00000R — Failing Instr.
- 1248AB" — Status Ind.'s Found on

C. "Pertinent Data" Any valuable data

D. "Reg Error Action" Given if TAD 1 = 1
CE would now select any program control option desired.

26.08 DC01 Summary

A. Switch Settings Previous to Running
1. HAO On
2. All other 7631-1302 Switches Off

B. Special TAD 0 Loc 1004
1 Do not display failing Addr
1 Display failing Addr
Set to 1 when program is loaded.

C. Operating Requests
1. "Sel Mode"
CE selects mode and starting track Addr,
Enter " X 0000"

- X — Operating Mode
- 0000 — Starting Track *

Mode - Test Codes

Test	Mode			
	Entire Mod	One Cyl	One Track	One Surface
Write HA1's & Verify	1	A	J	/
Verify Addr	2	B	K	S
Analyze Surface	3	C	L	T
Wrt HA1, Analyze, & Verify	4	D	M	U
Analyze & Verify	5	E	N	V

* NOTE: Starting Track Addr for Entire Module or One Cyl Mode must be Bottom Track of Cyl., for one Surface Addr must be that of the outer most track. For one track, address may be for any track.

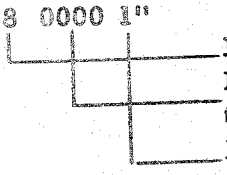
2. "Test Acc 0 Mod 0 Ch 1"

Enter A 1 if Correct, A $\bar{1}$ otherwise

D. Flag-A-Track Option

The program will Flag A Track only at the CE's request.
To flag a track

1. Press Inquiry
2. Enter "8 0000 1"



3. Press Release
4. Flagging is complete when "Trck Flgd OK" Message is Typed. CE must then select another option.

26.09 DC02 Summary

A. Switch Settings.

1. HA0 on (On all 7631 to be tested)
2. All other 7631-1302 switches off
3. All 1302's not to be tested are set in op.

B. Special TAD 0 Loc 1004
   $\bar{1}$ Do not run in Manual Mode
   1 Run in Manual Mode

C. Special Request (Manual Mode)
   1. "CYO Avail" Enter 1 if it is
      Enter $\bar{1}$ if it is not
   2. "CE-HAO ON"
      "Addr Read, 000000, CE-HAO OFF"
      Turn Switch On and then Off.
   3. "Comp Reset & Start"
      Press Computer Reset and Start.

D. Test Overlap - Files & Tapes
   To perform this test the program must be run in manual mode.

26.10 DC03 Summary

A. Switch Settings
   1. 1302 Mod 0, Acc 0 should be ready, all other access should be in op.
   2. HAO, CE-HAO, CE-TRK, and WRT FMT Switches on.
   3. Check control switch to reset and restart (1415)

B. Special Requests

   1. "Comp. Reset, Chk 7631"
      Press Computer reset and check condition of 7631, press start.
   2. "ACC 0 to CYL 000"
      "ACC 0 to CYL 110" Manual Mode
      "ACC 0 to CYL 194"
      Manually position access
   3. "# of Spare Heads"
      Enter number of heads available for alternate tracks
   4. "CE-HAO OFF"
      Turn off Switch press start

5. "CYO"
   Enter 1 if it is available
   Enter $\bar{1}$ if it is not

6. "Enter 1 if Mod 3 or 5 7631"
   Enter 1 is it is Mod 3 or 5
   Enter $\bar{1}$ if it is not

7. "HAO & WRT FMT SWS OFF"
   Turn off switches

8. "Write Inhibit and HAO Sws ON"
   Turn Switches ON

9. "Write Inhibit Off, HAO and CE HAO ON"
   Turn Switches Off and On Accordingly

10. "Pass, Sws Off"
    Test is complete, reset all switches
    and press start.

26.11 DC04 Summary

A. Switch Settings

1. HAO ON
2. Write Inhibit ON
3. All 1302 Access Set In op than are not to be tested

B. Special TAD 0, Loc 1004

$\bar{1}$ Do not display failing address
Do not take additional 20 min. warm up

1 Display failing address
Take additional 20 min. warm up

C. Select Seek Address

The CE may seek between any 2 addresses desired and get an average seek time for 100 seeks by

1. Press Inquiry
2. Enter "8"
3. Press Release

The program will request the CE to enter 8 Digit from and to Addresses. After these are entered the program seeks between the selected addresses.

This routine is left by

1. Pressing Inq
2. Enter 7
3. Press Release