Diagnostic Engineering Publications

1410/7010

001

DSD - POUGHKEEPSIE
December 31, 1964

Subject: Diagnostic Program DUO1A
Sequence #390
Replaces N/A

I. This is a new file program for use on either a 1301 or 1302.

II. This program is compatible with TC50.

III. This program requires system and channel control cards.

Enclosures: 048 Pages
____ Card Deck for Card only Systems
8 Cards - Card Loaded and Core Clear
178 Cards No. 001-178 Data Cards
1 Card - Execute

Distribution: 1410
7010
Other - 1410 or 7010 with 1301 or 1302

6.50.00.0 1302/1301 Surface Re-Initialize and Flag Log Utility Program

00.1 Description

This program performs two utility functions on the 1302 or 1301 attached to a 1410/7010.

A. Restores all HA1 and flag addresses on any two surfaces effected by a drawer replacement.
B. Produces a log of all flagged tracks in the selected module.

The program will be operating in the area of the file that contains customer data and it takes the following steps to protect that data.

A. No format tracks are altered.
B. Selection of the module, access, and surfaces to be written must be manually verified.
C. Write operations are used only on the selected surfaces.
D. Error conditions in the file or 7631 will cause the program to terminate its operation.

All data that may have been on the selected surfaces will be destroyed. The HA1's are re-written on the surfaces and any tracks that were flagged will have the flags restored automatically. (In the case of surface 0, the CE must enter all flags to be restored.)

01.0 Operating Procedures

01.1 Loading Procedure

Use standard 1410/7010 Diagnostic Loading Procedures

01.2 Switch Settings Previous to Running Program

A. All Format Switches OFF.
B. All 7631 CE Switches OFF.
C. HAO Switch OFF.
D. All 1302/1301 files not to be tested should be set Inoperative.

6.50.01.3 Program Messages and Requests in their Order of Occurrence

A. "Enter 1 for 1301, 2 for 1302"

CE enters a 1 if the file is a 1301; he enters a 2 for a 1302.

B. "Enter 1 for Flag Log Only, 2 for Restore ADDR"

CE enters a 1 if no surfaces are to be restored only if the flag log is desired; he enters a 2 if surfaces are to be restored-the flag log will also be generated.

C. "Enter CHL, MOD, and ACC in that order"

CE enters channel number, module number, and access number that will be used.

D. "Enter 2 Digit Lower Head Number"

See chart on page 9 for number to be entered.

E. "Enter Number of Alter Heads Avail"

CE enters the number of available alternate heads on the selected access (2, 4, or 6).

F. "Selected access and Module are not Ready, Press Start" and Program will be Restarted'

If access and module that the CE selected are not ready, the program stops and may be restarted by pressing start.

G. "ACC X, MOD X, HEADS XX & XX, ON CHL X, where SLTD, enter 1 if this is correct, 2 if it is not"

The CE verifies that the correct life address has been entered and excepted by the program. If 2 is entered, the program restarts.

H. "Visually Check That the ACC, MOD, and Lower Head are SLTD and that all other ACC are INOP. If so, enter 1, if not enter 2"

The CE visually checks the 7631 and the file to insure the proper module, access, and head have been selected. He then enters 1 if the selection is verified, 2 if not. The program restarts if 2 is entered.

I. "Turn on the HAO, CE-HAO Switches, Press Start!

CE turns on switches.

J. "Turn on CE-WRT SW"

CE turns on the 7631 CE-WRT Switch and presses Start to continue. Issued only for 1302.

K. "Turn Off CE-WRT SW"

CE turns off the 7631 CE-WRT switch and presses Start to continue. Issued only for 1302.

L. "Enter HA1 & Flag for first track on Surface 0 to be Flagged"

If surface 0 is being restored, the CE must enter the track address to be flagged and the flag character to be used. Enter bbbbb if no tracks to flag.

M. "Enter HA1 & Flag Char for next TRK on Surf 0 to be Flagged"

CE enters the next sequential track address to flagged on surface 0 and the flag character to be used. Enter bbbbb if no more tracks to be flag.

6.50.02.0 Error Procedures and Messages

The program constantly monitors the status of the 7631/1302 for error conditions which may endanger the customer data on the file if the program continues. When an error is encountered the file operation is re-tried 10 times; if the error is still encountered, the program operation is terminated by the abort routine.

Before beginning the normal operation, the program performs a quick test at the CE-cyl to insure that the required file ops are functioning. Failure during this routine also results in the termination of the program run.

Once the program has been terminated, it cannot be restarted until it has been reloaded. This is done to impress the CE with the need to use the standard diagnostics to restore the 7631/1302 to an operational status, and to insure that the customer's data is protected.

02.1 Error Message Format

"ROUTINE NOO" Ident of routine in which error occurred
"*ERROR 00000 (1) M%FS"10000W (2) 1248AB" (3)

1. Starting address of failing routine.
2. Failing file instruction.
3. Status condition that was encountered.

02.2 ABORT Message

"The error indicated occurred 10 times consecutively and the program run is being terminated. Press start to call next diag."

6.50.03.0 Program Generated Locs & Tables

The program generates 2 logs, first is a log of all flagging errors that exist on the file; second is a log of all properly flagged tracks. The next two pages show examples of both types of logs.

FLAGGING ERROR LOG EXAMPLE

FLAGGING ERROR LOG

ALTER TRK	HA1	DATA TRK HA1	FLG	ERR TYPE
2	0001	0001	1	1
3	0002	0003	3	2
4	0005	0005	8	3
		0006		4

1 Multiple Alternates with = HA1's

2 Multiple Data Surfaces with = Flags/or Data Surface Flagged to Alternate that has no HA1

3 Alternate with HA1 = to a Data Surface which is not Flagged

4 Data Surface with an Illegal Flag

FLAG LOG EXAMPLE

FLAG LOG

TRACK ADDR (HA1)	FLAG CHAR.	
Cyl 000		
0001	2	
0004	4	*
Cyl 010		
0426	1	
0428	2	**
Cyl 101		
4067	4	
8632		
Cyl 249		
9971	5	
9985	6	

* Flags Restored On Affected Data Surfaces

** Addresses Restored On Affected Alternate Surfaces

All HA1's and flags are those read from data surfaces and checked against the addresses on the alternate surfaces.

Selecting Lower Surface Number; Use this chart to determine number

Drawer Replaced	Enter 2 Digit Number For 1301-ACC0	1302-ACC0	1302-ACC1
24	38	A6	N/A
23	36	00	38
22	34	02	36
21	32	04	34
20	30	06	32
19	28	08	30
18	26	10	28
17	24	12	26
16	22	14	24
15	20	16	22
14	18	18	20
13	16	A4	A1
12	14	A1	A4
11	12	20	18
10	10	22	16
09	08	24	14
08	16	26	12
07	04	28	10
06	02	30	08
05	00	32	06
04	A1	34	04
03	A4	36	02
02	A6	38	00
01	N/A	N/A	A6

N/A = Not Applicable

I/O DICOST DEFINE TADS

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

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PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1023                   *** I/O DICOST PROGRAM ***
1024                *** CHANNEL ALTER ROUTINE ***
1025          THIS ROUTINE ALTERS ALL I/O INSTRUCTIONS,BRANCH-ON-STATUS-
1026        INDICATOR-ON INSTRUCTIONS,AND BRANCH ON CHANNEL OVERLAP IN PRO-
1027        CESS INSTRUCTIONS ACCORDING TO THE CHANNEL INDICATED.THIS IS DONE
1028        BY SCANNING A DEFINED AREA OF MEMORY AND ALTERING THESE INSTRUC-
1029        TIONS.
1030
1031      CHALTR    SBR    X5              STORE ADDR                7  01013  G 00049 B
1032                MLCA   9&X5,X7         LOAD IX6 & IX7           12  01020  D 00*.9 00059 Y
1033      SCAN      SCNLA  0&X6,0&X6       SCAN FOR WM              12  01032  D 00*.0 00*.0 S
1034                SAR    X6              STORE ADDR OF OPER        7  01044  G 00054 A
1035                C      X6,X7           HAS ALL OF FLD BEEN      11  01051  C 00054 00059
1036                BH     13&X5           SEARCHED IF SO BRCH       7  01062  J 00*/3 U
1037                MLCS   1&X6,*&12       STORE OP CODE            12  01069  D 00*.1 01092 3
1038                BCE    MLORU,CODES,    IS OP CODE M             12  01081  B 01117 02563
1039                BCE                    IS OP CODE L              1  01093  B
1040                BCE                    IS OP CODE U              1  01094  B
1041                BCE    RX3OR1          IS OP CODE R              6  01095  B 01136
1042                BCE                    IS OP CODE X              1  01101  B
1043                BCE                    IS OP CODE 3              1  01102  B
1044                BCE                    IS OP CODE 1              1  01103  B
1045                BCE    JAY             IS OP CODE J              6  01104  B 01155
1046                B      SCAN            GO FIND NEXT OPER         7  01110  J 01032
1047      MLORU     MLCS   10&X5,2&X6      CHEANGE CH-MODE CHAR     12  01117  D 00*/0 00*.2 3
1048                B      SCAN            GO FIND NEXT OPER         7  01129  J 01032
1049      RX3OR1    MLCS   11&X5,1&X6      CHANGE B-I-S-I-O OP      12  01136  D 00*/1 00*.1 3
1050                B      SCAN            GO FIND NEXT OPER         7  01148  J 01032
1051      JAY       MLCS   7&X6,*&12       STORE MODIFIER           12  01155  D 00*.7 01178 3
1052                BCE    ONE234,MODS,    IS MODIFIER A 1          12  01167  B 01189 02567
1053                BCE                    IS MODIFIER A 2           1  01179  B
1054                BCE                    IS MODIFIER A 3           1  01180  B
1055                BCE                    IS MODIFIER A 4           1  01181  B
1056                B      SCAN            GO FIND NEXT OPER         7  01182  J 01032
1057      ONE234    MLCS   12&X5,7&X6      CHANGE BOL MODIFIER      12  01189  D 00*/2 00*.7 3
1058                B      SCAN            GO FIND NEXT OPER         7  01201  J 01032
1059                H                                                1  01208  .
10
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```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1061
1062                DEFINE SYSTEM & CHANNEL CONTROL CARDS
1063
1064                ORG    1221                                         01221
1065                DCW    @FN2FP6FJRFMLFJZFMTFJIFMC390/0@          29  01249
1066                ORG    1245                                         01245
1067      SYSCRD    DC     @ @              THIS CONTAINS  IF          1  01245
1068                                      SYSTEM CARD IS USED
1069      CH1CRD    DC     @ @                THESE CONTAIN   IF       1  01246
1070      CH2CRD    DC     @ @                THE CHANNEL CARD         1  01247
1071      CH3CRD    DC     @ @                IS USED                  1  01248
1072      CH4CRD    DC     @ @                                         1  01249
1073                                                **
1074                DEFINE PROGRAM TITLE
1075                                                **
1076                ORG    1250                                         01250
1077      TITLE     DCW    @DU01A@,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                    COMMENTS                          CT  ADDRS  INSTRUCTION
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&S                   STORE RETURN ADDR                  7  01517  G 01591 B
1108    TYPE     WCP    201                        TYPE MESSAGE                      10  01524  M %TO 00201 W
1109             BEXI   TYPE,M S                   BRCH ANY BUT WLR                   7  01534  R 01524 SMGM
1110             BAI    *&1                                                           7  01541  R 01548 SMGM
1111    SWI1     NOPWM                                                                1  01548  N
1112    LAB60    RCP    0                          READ CONSOLE PRINTER              10  01549  M %TO 00000 R
1113             BEXI   *-16,M S                   BRCH ON ANY BUT WLR                7  01559  R 01549 SMGM
1114             BAI    *&1                                                           7  01566  R 01573 SMGM
1115             CW     SWI1&1                     TURN OFF SWITCH I1                 6  01573  = 01549
1116             CS     330                        CLEAR PRINT AREA                   6  01579  / 00330
1117             CS                                                                   1  01585  /
1118    TYPXIT   B      0                          RETURN TO DICOST                   7  01586  J 00000
1119    TYP1     SBR    X1                         STORE ADDR OF MESG                 7  01593  G 00029 B
1120             B      *&14                                                          7  01600  J 01620
1121    TYP2     SBR    X1                         STORE ADDR OF MESG                 7  01607  G 00029 B
1122             SW     REPLY&1                    TURN ON REPLY SW                   6  01614  , 01652
1123             WCP    0&X1                       TYPE MESSAGE                      10  01620  M %TO 000#0 W
1124             SBR    X5                         SAVE ADDR                          7  01630  G 00049 B
1125             BEXI   *-23,M S                   BRCH ANY BUT WLR                   7  01637  R 01620 SMGM
1126             BAI    *&1                                                           7  01644  R 01651 SMGM
1127    REPLY    NOPWM                             BRCH                               1  01651  N
1128             B      RDCON                      IF REPLY REQUIRED                  7  01652  J 01666
1129             B      0&X5                       RETURN                             7  01659  J 00##0
1130    RDCON    RCP    0&X5                       REPLY                             10  01666  M %TO 00##0 R
1131             SBR    X1                         STORE RETURN ADDR                  7  01676  G 00029 B
1132             BEXI   *-23,M S                   BRCH ON ANY BUT WLR                7  01683  R 01666 SMGM
1133             BAI    *&1                                                           7  01690  R 01697 SMGM
1134             CW     REPLY&1                                                       6  01697  = 01652
1135             B      0&X1                       RETURN                             7  01703  J 000#0
```

```
PGLIN  LABEL   OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
1136   DATA    MLCWS  @N@,PASS1          RESET FIRST PASS INST        12  01710  D 09733 01944 7
1137           BCE    *&13,1264,1        BRCH IF PRIORITY AVAILABLE   12  01722  B 01746 01264 1
1138           MLCWS  @N@,MONITR&7       ALTER PRIORITY INST TO NO-OP 12  01734  D 09733 02061 7
1139           B      PASS1&7            RETURN TO NORMAL INITIALIZE   7  01746  J 01951
1140           H                                                       1  01753  .
1141
1142           *** ERROR TABLES THESE ARE USED FOR ERROR ***
1143           *** SUMMARIES AND ERROR INDENTIFICATION ***
1144
1145           ORG    *&X00                                               01800
1146           ORG    *&1                                                 01801
1147   STPTAB  DCW    @L@                                              1  01801
1148   E1      DC     @ @                                              1  01802
1149   E2      DC     @ @                                              1  01803
1150   E3      DC     @ @                                              1  01804
1151   E4      DC     @ @                                              1  01805
1152   E5      DC     @ @                                              1  01806
1153   E6      DC     @ @                                              1  01807
1154   E7      DC     @ @                                              1  01808
1155   E8      DC     @ @                                              1  01809
1156   E9      DC     @ @                                              1  01810
1157   E10     DC     @ @                                              1  01811
1158   E11     DC     @ @                                              1  01812
1159   E12     DC     @ @                                              1  01813
1160   E13     DC     @ @                                              1  01814
1161   E14     DC     @ @                                              1  01815
1162   E15     DC     @ @                                              1  01816
1163   E16            @ @                                              1  01817
1164   E17            @ @                                              1  01818
1165   E18            @ @                                              1  01819
1166   E19            @ @                                              1  01820
1167   E20            @ @                                              1  01821
1168   E21            @ @                                              1  01822
1169   E22            @ @                                              1  01823
1170   E23            @ @                                              1  01824
1171   E24            @ @                                              1  01825
1172   E25     DC     @ @                                              1  01826
```

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
1173	E26	DC	a a	1	01827	
1174	E27		a a	1	01828	
1175	E28		a a	1	01829	
1176	E29		a a	1	01830	
1177	E30		a a	1	01831	
1178	E31		a a	1	01832	
1179	E32		a a	1	01833	
1180	E33		a a	1	01834	
1181	E34		a a	1	01835	
1182	E35		a a	1	01836	
1183	E36		a a	1	01837	
1184	E37		a a	1	01838	
1185	E38		a a	1	01839	
1186	E39		a a	1	01840	
1187	E40		a a	1	01841	
1188	E41		a a	1	01842	
1189	E42		a a	1	01843	
1190	E43		a a	1	01844	
1191	E44		a a	1	01845	
1192	E45		a a	1	01846	
1193	E46		a a	1	01847	
1194	E47		a a	1	01848	
1195	E48		a a	1	01849	
1196	E49		a a	1	01850	
1197	E50		a a	1	01851	
1198	E51	DC	a a	1	01852	
1199	E52		a a	1	01853	
1200	E53		a a	1	01854	
1201	E54		a a	1	01855	
1202	E55		a a	1	01856	
1203	E56		a a	1	01857	
1204	ERRTAB	DC	a*a	1	01858	
1205		DC	a a	1	01859	
1206						

```
PGLIN  LABEL   OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1208           *** INITIALIZE ROUTINE FOR THE DICOST PROGRAM ***
1209   INITLE  WCP    1250                 PRINT TITLE          10  01860  M %TO 01250 W
1210           BCB1   *-16                                       7  01870  R 01860 2G
1211           BA1    *&1                                        7  01877  R 01884 M
1212           CS     99                   RESET IND REG S      6  01884  / 00099
1213           SW     25                   SET WM IN IND REG 1  6  01890  , 00025
1214           MLCS   @+@,100              PREPARE TO LOAD 2-15 12  01896  D 09734 00100 3
1215           MRWR   25,30                LOAD IND REG 2-15    12  01908  D 00025 00030 %D
1216           MRCWG  RESUME,1             MOVE RESET PROCEDURE 12  01920  D 02015 00001 LD
1217           MRCWG  INTR,101             MOVE INTERUPT PROC   12  01932  D 02007 00101 L
1218   PASS1   B      DATA                 GO DO  MORE INITIALIZING 7  01944  J 01710
1219           CW     LPRT,SW11&1                               11  01951  ¤ 02575 01549
1220           CS     E56D                 CLEAR AND RESET      6  01962  / 01857
1221           MLCWS  @L@,STPTAB           ERROR TABLE          12  01968  D 09735 01801 7
1222           B      START                GO TO ROUTINE INIT.  7  01980  J 03303
1223           H                                                1  01987  .
1224           ORG    2000                                          02000
1225           B      INITLE                                    7  02000  J 01860
1226           *** RESET & INTERUPT ROUTINES,THESE ROUTINES ***
1227           *** ARE MOVED TO LOCATIONS 1 & 101
1228   INTR    BNQ    PRGCTLG              RETURN TO PROG CNTRL 7  02007  J 02226 Q
1229           DCW    @M@                                       1  02014
1230   RESUME  B      CKLUPG                                    7  02015  J 02023
1231           DCW    @M@                                       1  02022
1232   CKLUP   BW     MONITR,LPRT          CHECK FOR LOOP ROUT  12  02023  V 02054 02575 1
1233           MLNA   X3,X2                LOAD IX 2            12  02035  D 00039 00034 /
1234           B      MONITR&7             GO TO MONITR         7  02047  J 02061
1235
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1237                       *** I/O DICOST PROGRAM ***
1238                   ***       MONITOR ROUTINE       ***
1239          A STATUS ERROR HAS BEEN DETECTED AND INDICATED.IN THE CASE OF A
1240          STATUS ERROR MONITOR SIMPLY BRANCHES BACK TO THE POINT AT WHICH
1241          THE STATUS ERROR WAS DETECTED.WHEN ENTERED FROM THE END OF A
1242          TEST ROUTINE MONITOR CHECKS TO SEE IF THE CE PRESSED INQUIRY,THE
1243          ROUTINE IS BEING LOOPED,ANY ERRORS OCCURED ALTER ROUTINE SEQUENCE
1244          IS SELECYED,OR THE NEXT SEQUENCIAL ROUTINE SHOULD BE RUN.
1245
1246      MONITR    SBR    X2          STORE ADDR                    7  02054  G 00034 B
1247                BXPA   *&1         EXIT ALERT MODE               7  02061  Y 02068 X
1248                BNQ    PRGCTL      WAS THERE AN INQ              7  02068  J 02226 Q
1249      MONIT1    BW     O&X3,LPRT   RETURN IF LOOPING RT         12  02075  V 000M0 02575 L
1250      MONIT2    MLCWS  @M@,224     SET WMGM SHORT MESG          12  02087  D 09736 00224 7
1251                B      ERRCTL                                    7  02099  J 02635
1252      MONIT3    NOP                                              1  02106  N
1253                MLCWA  X2,X3       LOAD IX3                     12  02107  D 00034 00039 X
1254                MLCWS  @ @,224     CLEAR WMGM                   12  02119  D 09737 00224 7
1255                B      O&X2        GO TO NEXT ROUTINE            7  02131  J 000.0
1256      WHERE2    MLCWS  *-12,224    CLEAR WMGM                   12  02138  D 02137 00224 7
1257                BCE    *&8,O&X2,N  BRCH IF ROUT COMP            12  02150  B 02169 000.0 N
1258                B      O&X2        RETURN TO ROUTINE             7  02162  J 000.0
1259                BZN    *&8,1&X2,2  BRCH IF CHAR IS NUMR         12  02169  V 02188 000.1 2
1260                B      O&X2        RETURN TO ROUTINE             7  02181  J 000.0
1261                BZN    *&8,2&X2,2  BRCH IF CHAR IS NUMR         12  02188  V 02207 000.2 2
1262                B      O&X2        RETURN TO ROUTINE             7  02200  J 000.0
1263                BW     MONIT3,3&X2 BRCH IF CHAR HAS WM          12  02207  V 02106 000.3 1
1264                B      O&X2        RETURN TO ROUTINE             7  02219  J 000.0
1265
```

```
PGLIN   LABEL    OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1267                    *** I/O DICOST PROGRAM ***
1268                *** PROGRAM CONTROL ***
1269          WHEN THE CE PRESSES INQUIRY TO SELECT A STANDARD PROGRAM OPTION
1270        THIS ROUTINE IS ENTERED.THE CE ENTERS ON THE TYPEWRITER THE
1271        OPTION CODE DESIRED,ALONG WITH THE DATA NEEDED BY THE OPTION.THE
1272        ROUTINE DETERMINES WHICH OPTION HAS BEEN SELECTED AND INITIATES
1273        THE OPTION.
1274
1275   PRGCTL   RCPW   CTLFLD          READ THE CONSOLE PRT                10  02226  L %TO 00201 R
1276            SBR    X1                                                   7  02236  G 00029 BS
1277            BEXI   PRGCTL,M        BRCH ON ANY BUT WLR                  7  02243  R 02226 SM
1278            SW     CTLFLD&1                                             6  02250  , 00202
1279            BAI    *&1                                                  7  02256  R 02263 GM
1280            CW     LPRT,LPINST     TURN OFF LOOP SWS                   11  02263  ¤ 02575 02576
1281            MLWS   *,E1            CLEAR WM IN ERROR                   12  02274  D 02285 01802 4
1282            MRWR   E1,E2             TABLE                             12  02286  D 01802 01803 %
1283            MLCS   CTLFLD,*&12     MOVE CTL CODE ENTERD                12  02298  D 00201 02321 3
1284            BCE    ENDTST,CTLCOD,  IS CTL CODE BLANK                   12  02310  B 08687 02574
1285            BCE    ALTADS          IS CTL CODE 1                        6  02322  B 02365
1286            BCE    ALTMEM          IS CTL CODE 2                        6  02328  B 02388
1287            BCE    LUPRT           IS CTL CODE 4                        6  02334  B 02435
1288            BCE    ONELUP          IS CTL CODE 5                        6  02340  B 02464
1289            BCE    RSTART          IS CTL CODE 6                        6  02346  B 02522
1290            BCE    CONT            IS CTL CODE 7                        6  02352  B 02545
1291            B      PRGCTL                                               7  02358  J 02226
1292   ALTADS   MLCA   CTLFLD&4,1003   MOVE IN NEW TADS                    12  02365  D 00205 01003 T
1293            CS     MONIT1,299      CLEAR OUT CTL FLD                   11  02377  / 02075 00299
1294   ALTMEM   MLCA   CTLFLD&5,*&9    MOVE ADDR TO BE ALTR                12  02388  D 00206 02408 T
1295            RCPW   0               ALTER MEMORY                        10  02400  L %TO 00000 R
1296            BEXI   *-16,M          CHECK ALL BUT WQR                    7  02410  R 02400 SM
1297            BAI    *&1                                                  7  02417  R 02424 GM
1298            CS     MONIT1,299      CLEAR THE CNTRL FLD                 11  02424  / 02075 00299
1299   LUPRT    SW     LPRT            TURN ON LOOP SWITCH                  6  02435  , 02575
1300            MLNA   CTLFLD&5,X2     LOAD IND REG2                       12  02441  D 00206 00034 /
1301            CS     MONIT2,299      CLEAR CNTRL FLD                     11  02453  / 02087 00299
1302   ONELUP   SW     LPINST          TURN ON LOOP INST SW                 6  02464  , 02576
1303   LUPINT   B      TYP1                                                 7  02470  J 01593
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1304                DCW    @THIS OPTION NOT AVAILABLE,TRY ANOTHER@,G 37  02513
1305                B      PRGCTL                                    7  02515  J 02226
1306      RSTART    MLNA   CTLFLD&5,X2          LOAD IND REG2      12  02522  D 00206 00034 /
1307                CS     MONIT2,299           CLEAR CNTRL FLD    11  02534  / 02087 00299
1308      CONT      CS     WHERE2,299           CLR CNTL FLD       11  02545  / 02138 00299
1309
1310                I/O DICOST CONSTANTS
1311      CODES     DCW    @J13XRULM@                               8  02563
1312      MODS      DCW    @4321@                                   4  02567
1313                DCW    @7@                                      1  02568
1314                DC     @6@                                      1  02569
1315                       @5@                                      1  02570
1316                       @4@                                      1  02571
1317                       @2@                                      1  02572
1318                       @1@                                      1  02573
1319      CTLCOD           @ @                                      1  02574
1320      LPRT      DC     @ @                                      1  02575
1321      LPINST    DC     @ @                                      1  02576
1322      ADDR02    DCW    ERRTAB               ADDR OF ERR TABLE    5  02581  01858
1323      ERR       DCW    @*ERROR@                                 6  02587
1324       ACTION   DC     @REQ ERROR ACTION@,G                    16  02588
1325      ERCODE    DCW    @547P@                                   4  02608
1326       SAVIND   DCW    @1 2 4 8 A B@,G                         11  02609
1327       STIND    DC     @1 2 4 8 A B@,G                         11  02621
1328       NOERSW   DC     @ @                                      2  02633
1329
```

```
PGLIN  LABEL    OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1331                 *** I/O DICOST PROGRAM ***
1332               ***      ERROR CONTROL      ***
1333          THIS ROUTINE DETERMINES IF ANY STATUS ERRORS OR PROGRAM DETECT-
1334        ED ERRORS HAVE TO BE INDICATED,IF THERE ARE THIS ROUTINE BUILDS
1335        THE ERROR MESSAGE AND HAS IF TYPED OUT.THIS ROUTINE ALSO CHECKS
1336        TAD 1 TO SEE IF A REQUEST FOR ERROR ACTION SHOULD BE MADE.
1337
1338               LOCATE FAILING INST
1339
1340  ERRCTL    MLCA   X2,X5            LOAD IND REG 5          12  02635  D 00034 00049 T
1341            S      @1@,X5                                   11  02647  S 09738 00049
1342            SCNLA  0&X5,0&X5        SCAN THE ROUTINE        12  02658  D 00##0 00##0 S B
1343            SAR    X5               STORE CHAR ADDR          7  02670  G 00049 A
1344            BCE    LODFLD,1&X5,M    BRCH IF MOVE OP         12  02677  B 02714 00##1 M
1345            C      X3,X5            HAS ROUTINE BEEN        11  02689  C 00039 00049
1346            BL     LODFLD&12         SEARCHED               7  02700  J 02726 T
1347            B      ERRCTL&12        GO CONTINUE THE SRCH     7  02707  J 02647
1348  LODFLD    MLCA   10&X5,243        MOVE FAILING OPER       12  02714  D 00#/0 00243 T
1349            MLNA   X3,223           MOVE ADDR OF ROUT       12  02726  D 00039 00223 /
1350            ZA     ADDR02,X1        LOAD ND REG 1           11  02738  Q 02581 00029 M Q
1351            ZA     @00209@,X5       LOAD IND REG 5          11  02749  M 09743 00049
1352                 SCAN ERROR TABLE & UPDATA ERROR COUNT
1353  ERSCAN    SCNLA  0&X1,0&X1        SCAN THE ERROR TABLE    12  02760  D 000#0 000#0 S B
1354            SAR    X1               STORE ADDR               7  02772  G 00029 A
1355            BCE    AFTSRH,1&X1,L D  HAS TABLE BEEN COMP.    12  02779  B 02838 000#1 D L
1356            SW     X1-1            DEFINE ERROR             6  02791  , 00028
1357            MLNWA  X1,0&X5          MOVE ERROR CODE NO.     12  02797  D 00029 00##0 V
1358            A      @3@,X5           UPDATE IND REG 5        11  02809  A 09744 00049
1359                                 NINE TIMES
1360            CW     1&X1,X1-1         CLEAR WM S             11  02820  ¤ 000#1 00028
1361            B      ERSCAN                                    7  02831  J 02760
1362                 LOAD PRINT FIELD WITH ERROR MESG
1363  AFTSRH    BCE    WHERE2,1000,1    BRCH,NO MESG. IND       12  02838  B 02138 01000 1
1364  ERROSW    NOP                                            1  02850  N
1365            BCE    WHERE2,209       BRCH IF NO ERRORS       12  02851  B 02138 00209
1366            SW     ERROSW&1         RESET ERROR SW          6  02863  , 02851
1367            MLCA   ERR,206          MOVE ERROR              12  02869  D 02587 00206 T
1368            MLCA   2&X3,ROUTID      MOVE ROUTINE IDENT      12  02881  D 000M2 Q 02910 T
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1369                B      TYP1              GO TYPE ROUTINE ID      7  02893  J 01593
1370                DCW    @ROUTINE @                                8  02907
1371      ROUTID    DC     @   @,G                                   3  02910
1372                B      TYMES                                     7  02912  J 01517
1373                     TYPE ADDITIONAL  ERROR INFORMATION
1374      EXTRA     NOPWM                                            1  02919  N
1375                WCP    DATA              PRINT EXTRA DATA       10  02920  M %TO 01710 W
1376                BCB1   *-16                                      7  02930  R 02920 2
1377                BA1    *&1                                       7  02937  R 02944 GM
1378                CW     EXTRA&1                                   6  02944  ¤ 02920
1379      ACT       BCE    *&8,1001,1        LOOP ACTION REQUIRED   12  02950  B 02969 01001 1
1380                B      WHERE2                                    7  02962  J 02138
1381                SW     LUPINT&1          TURN ON SWITCH          6  02969  , 02471
1382                MRCWG  ACTION,201        MOVE ACTION MESG       12  02975  D 02588 00201 DL
1383                B      TYMES                                     7  02987  J 01517
1384                B      PRGCTL                                    7  02994  J 02226
1385
1386                   *** I/O DICOST PROGRAM ***
1387              *** DETERMINE WHICH STATUS INDICATORS ARE ON ***
1388         THIS ROUTINE DETERMINES WHICH STATUS INDICATORS ARE ON,ON THE
1389          CHANNEL BEING USED.THE INDICATORS FOUND  ON ARE STORED IN THE
1390          PRINT FIELD AND THE PROGRAM BRANCHES TO ERROR CONTROL.
1391      STACHK    SBR    X5                STORE ADDR IN IND 5      7  03001  G 00049 B
1392                SBR    X2                                         7  03008  G 00034 B
1393                BW     0&X2,LPRT                                 12  03015  V 000.0 02575 1
1394                S      @7@,X5            REDUCE ADDR BY 7        11  03027  S 09745 00049
1395                MRCWG  STIND,237         MOVE STATUS CODES       12  03038  D 02621 00237 DL
1396                MLCS   0&X5,NUOPCO       STORE CHNL CODE         12  03050  D 00**0 03080 3
1397                B      CHALTR                                     7  03062  J 01013
1398                DCW    CNTERR            HIGH LIMIT              5  03073  03235
1399                DC     NOTRDY            LOW LIMIT               5  03078  03093
1400                DCW    @ @                                       1  03079
1401      NUOPCO    DC     @ @                                       1  03080
1402                DC     @ @                                       1  03081
1403                ZA     @00237@,X5        LOAD IX 5              11  03082  QM 09750 00049
1404      NOTRDY    NOP                                              1  03093  N
1405                BNR1   CNTERR            CHECK FOR NOT READY     7  03094  R 03235 1
1406                B      UPIX              GO UPDATE IND REG       7  03101  J 03266
```

```
PGLIN  LABEL   OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1407   BUSY    NOP                                      1  03108  N
1408           BCB1   CNTERR          CHECK FOR BUSY    7  03109  R 03235 2
1409           B      UPIX          GO UPDATE IND REG   7  03116  J 03266
1410   DATACK  NOP                                      1  03123  N
1411           BER1   CNTERR          CHECK DATA CNK    7  03124  R 03235 4
1412           B      UPIX          GO UPDATE IND REG   7  03131  J 03266
1413   EXTCND  NOP                                      1  03138  N
1414           BEF1   CNTERR          CHECK FOR EXT COND 7  03139  R 03235 8
1415           B      UPIX          GO UPDATE IND REG   7  03146  J 03266
1416   NOTRNS  NOP                                      1  03153  N
1417           BNT1   CNTERR          CHECK FOR NO TRANS 7  03154  R 03235 $
1418           B      UPIX          GO UPDATE IND REG   7  03161  J 03266
1419   WLR     NOP                                      1  03168  N
1420           BWL1   CNTERR          CHECK FOR WLR     7  03169  R 03235 -
1421           B      UPIX          GO UPDATE IND REG   7  03176  J 03266
1422           SW     NOTRDY&1,BUSY&1  RESET INSTRUCTIONS 11 03183  , 03094 03109
1423           SW     DATACK&1,EXTCND&1                 11  03194  , 03124 03139
1424           SW     NOTRNS&1,WLR&1                    11  03205  , 03154 03169
1425           MRCG   237,SAVIND       SAVE IND          12  03216  D 00237 02609 $
1426           B      ERRCTL           RETURN           7  03228  J 02635
1427   CNTERR  SBR    X6               STORE RETURN ADDR 7  03235  G 00054 B
1428           A      @7@,X6           UPDATE RETURN ADDR 11 03242  A 09745 00054
1429           CW     ERROSW&1         TURN OFF ERROR SW  6  03253  ¤ 02851
1430           B      UPIX&19                            7  03259  J 03285
1431   UPIX    SBR    X6               STORE RETURN ADDR 7  03266  G 00054 B
1432           MLCS   @ @,0&X5         REMOVE STATUS CHAR 12 03273  D 09737 00‡‡0 3
1433           A      @2@,X5           UPDATE IND REG 5  11  03285  A 09751 00049
1434           B      0&X6             RETURN TO PROGRAM 7  03296  J 00‡.0
1435
1436   CTLFLD  EQU    201
1437           PST
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1439            THIS ROUTINE ALLOWS THE CE TO SELECT THE MODE OF OPERATION,THE
1440          MODULE,ACCESS,&CHANNEL TO BE USED AND VERIFIES THE SELECTION
1441          MADE.IT ALSO SETS ALL OTHER ACCESSES INOP AND INITIALIZE THE
1442          PROGRAM.
1443      START     MRCWG  INTADR,LHADDR      RESET LOW HEAD ADDR      12  03303  D 09965 09825 D
1444                MRCWG  INTADR,UHADDR      RESET UP  HEAD ADDR      12  03315  D 09965 09840 D
1445                MRCWG  INTADR,VERADD      RESET VER HEAD ADDR      12  03327  D 09965 09855 D
1446                MRCWG  INTADR,TSTADD      RESET TST HEAD ADDR      12  03339  D 09965 09870 D
1447                MRCWG  INTADR,RDADDR      RESET RD  HEAD ADDR      12  03351  D 09965 09885 D
1448                MRCWG  INTFLD,LHADDR&9     RESET DATA FLD          12  03363  D 09974 09834 D
1449                MRCWG  INTFLD,UHADDR&9                             12  03375  D 09974 09849 D
1450                MRCWG  INTFLD,VERADD&9                             12  03387  D 09974 09864 D
1451                MRCWG  INTFLD,TSTADD&9                             12  03399  D 09974 09879 D
1452                MRCWG  INTFLD,RDADDR&9                             12  03411  D 09974 09894 D
1453                MLCWA  @00@,LOWHD         RESET HEAD SELECTION     12  03423  D 09753 03631 X
1454                CW     SURF0                                       6  03435  ¤ 10040
1455                B      TYP2                                        7  03441  J 01607
1456                DCW    @ENTER 1 FOR 1301,2 FOR 1302@,G             27  03474
1457      ONE2      DC     @ @,G                                       1  03476
1458                B      TYP2                                        7  03478  J 01607
1459                DCW    @ENTER 1 FOR FLAG LOG ONLY,2 FOR RESTORE ADDR@,G  44  03528
1460      FUNCTN    DC     @ @,G                                       1  03530
1461                B      TYP2                                        7  03532  J 01607
1462                DCW    @ENTER CHL,MOD,& ACC IN THAT ORDER@,G       33  03571
1463      CMA       DCW    @  @,G                                      3  03575
1464                BCE    RAA,FUNCTN,1       BRCH IF FLAG LOG ONLY    12  03577  B 03633 03530 1
1465                B      TYP2                                        7  03589  J 01607
1466                DCW    @ENTER TWO DIGIT LOWER HEAD NUMBER@,G       33  03628
1467      LOWHD     DCW    @00@,G                                      2  03631
1468      RAA       B      TYP2                                        7  03633  J 01607
1469                DCW    @ENTER NUMBER OF ALTER HEADS AVAIL@,G       33  03672
1470      AVALTR    DCW    @ @,G                                       1  03674
1471                MLCS   CMA-1,LHADDR&1     SET MODULE ADDR          12  03676  D 03574 09826 3
1472                MLCS   CMA,LHADDR         SET ACCESS ADDR          12  03688  D 03575 09825 3
1473                BCE    INTALT,LOWHD-1,A   BRCH IF RESTORING ALTERNATES  12  03700  B 03743 03630 A
1474                MLCA   LOWHD,LHADDR&5     SET HEAD ADDR            12  03712  D 03631 09830 T
1475                MLCA   @00@,LHADDR&3      SET TRACK ADDR           12  03724  D 09753 09828 T
1476                B      *&25                                        7  03736  J 03767
```

```
PGLIN  LABEL   OPCOD  OPERAND                 COMMENTS                        CT  ADDRS  INSTRUCTION
1477   INTALT  MLCS   LOWHD,LHADDR&6          LOAD ALTER ADDR                 12  03743  D 03631 09831 3
1478           MLCA   @0001@,LHADDR&5         LOAD TRACK ADDR                 12  03755  D 09757 09830 T
1479           ZA     @0000@,X14                                               11  03767  M 09761 00094
1480           ZA     @1308@,X15                                               11  03778  M 09765 00099
1481   LOCHL   BCE    FILCHL,0&X15,F          1301 ON THIS CHL                12  03789  B 03854 00MMO F
1482           BCE    FILCHL,24&X15                                            12  03801  B 03854 00M04
1483   UPDX15  A      @57@,X15                                                 11  03813  A 09767 00099
1484           A      @3@,X14                                                  11  03824  A 09744 00094
1485           BCE    SETCHL,X15,I            BRCH AFTER ALL ACC SET INOP     12  03835  B 04056 00099 I
1486           B      LOCHL                                                    7  03847  J 03789
1487   FILCHL  MLCA   CODE3&X14,TSTCH         MOVE CHL CODES                  12  03854  D 10MK3 03885 T
1488           B      CHALTR                  GO INITIALIZE PROG               7  03866  J 01013
1489           DCW    TOP                                                      5  03877  03933
1490           DC     BOTTOM-1                                                 5  03882  03891
1491           DCW    @ @                                                      1  03883
1492           DC     @ @                                                      1  03884
1493   TSTCH   DC     @ @                                                      1  03885
1494           S      TSTADD                  RESET ADDR                       6  03886  S 09870
1495   BOTTOM  C      TSTADD&1,LHADDR&1       IS THIS THE TEST MODULE         11  03892  C 09871 09826
1496           BE     CHKCHL                  IF SO BRCH                       7  03903  J 04019 S
1497           MU     %F8,TSTADD,R            SET ACCESS INOP                 10  03910  M %F8 09870 R
1498           BA1    *&1                                                      7  03920  R 03927 M
1499   NXTMOD  SW     TSTADD&1                                                 6  03927  , 09871
1500   TOP     A      @1@,TSTADD&1            UPDATE MODULE ADDR              11  03933  A 09738 09871
1501           CW     TSTADD&1                                                 6  03944  ¤ 09871
1502           BZ     *&8                     BRCH AFTER 10 MODULES            7  03950  J 03964 V
1503           B      BOTTOM                                                   7  03957  J 03892
1504           BCE    *&8,ONE2,2              BRCH IF 1302                    12  03964  B 03983 03476 2
1505           B      UPDX15                                                   7  03976  J 03813
1506           A      @1@,TSTADD              ADD 1 TO  ACCESS ADDR           11  03983  A 09738 09870
1507           BCE    BOTTOM,TSTADD,1                                         12  03994  B 03892 09870 1
1508           S      TSTADD&1                RESET ACCESS AND MODULE ADDR     6  04006  S 09871
1509           B      UPDX15                                                   7  04012  J 03813
1510   CHKCHL  C      TSTCH,CMA-2             IS THIS THE CHL                 11  04019  C 03885 03573
1511           BU     NXTMOD                  IF NOT BRCH                      7  04030  J 03927 /
1512           MLCA   TSTCH,OPERCH            MOVE CHANNEL CODES              12  04037  D 03885 04087 T
1513           B      NXTMOD                                                   7  04049  J 03927
```

```
PGLIN  LABEL   OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
1514   SETCHL  BCE    STOP&31,OPERCH,    BRCH IF NO FILES ON THIS CHL  12  04056  B 04119 04087
1515           B      CHALTR                                           7  04068  J 01013
1516           DCW    NO4XIT                                           5  04079  08082
1517           DC     STOP-1                                           5  04084  04087
1518           DCW    @ @                                              1  04085
1519           DC     @ @                                              1  04086
1520   OPERCH  DC     @ @                                              1  04087
1521   STOP    SD     1,LHADDR           VERIFY SELECTED ACCESS IS RDY 10  04088  M %F0 09825 R
1522           BAI    *&1                                              7  04098  R 04105 M
1523           BNR1   *&8                BRCH IF NOT RDY               7  04105  R 04119 1
1524           B      GOON                                             7  04112  J 04213
1525           B      TYP1                                             7  04119  J 01593
1526           DCW    @SELECTED ACCESS & MODULE ARE NOT READY,PRESS START@  50  04175
1527           DC     @ AND PROGRAM WILL BE RESTARTED@,G                30  04205
1528           H      START                                            6  04207  . 03303
1529   GOON    MLCS   CMA,VERMSG&4       MOVE ACCESS ADDR              12  04213  D 03575 04307 3
1530           MLCS   CMA-1,VERMSG&10    MOVE MODULE ADDR              12  04225  D 03574 04313 3
1531           MLCS   CMA-2,VERMSG&32    MOVE CHL NUMBER               12  04237  D 03573 04335 3
1532           MLCA   LOWHD,VERMSG&19    MOVE HEAD ADDR                12  04249  D 03631 04322 T
1533           MLCA   LOWHD,VERMSG&23                                  12  04261  D 03631 04326 T
1534           A      @1@,VERMSG&23      CREATE UPPER HEAD ADDR        11  04273  A 09738 04326
1535           BCE    FLVER,FUNCTN,1     BRCH IF FLAG LOG ONLY         12  04284  B 04410 03530 1
1536           B      TYP2                                             7  04296  J 01607
1537    VERMSG DCW    @ACC  ,MOD  ,HEADS   & @                        22  04303
1538           DCW    @  ,ON CHL  ,WERE SLTD,ENTER 1 IF THIS IS CORRECT,@  49  04373
1539           DC     @2 IF IT IS NOT@,G                               14  04387
1540           DC     @ @,G                                            1  04389
1541           BCE    START,*-13,2       BRCH IF SELECTION IS INCORRECT  12  04391  B 03303 04389 2
1542           B      VISCHK                                           7  04403  J 04540
1543   FLVER   MLCS   CMA,FLVMSG&4       MOVE ACC ADDR                 12  04410  D 03575 04457 3
1544           MLCS   CMA-1,FLVMSG&10    MOVE MOD ADDR                 12  04422  D 03574 04463 3
1545           MLCS   CMA-2,FLVMSG&19    MOVE CHL                      12  04434  D 03573 04472 3
1546           B      TYP2                                             7  04446  J 01607
1547    FLVMSG DCW    @ACC  ,MOD  ,ON CHL  ,WERE SLTD,ENTER 1 IF THIS IS @  50  04453
1548           DC     @CORRECT,2 IF IT IS NOT@,G                       22  04524
1549           DCW    @ @,G                                            1  04526
1550           BCE    START,*-13,2       BRCH IF SELECTION INCORRECT   12  04528  B 03303 04526 2
1551   VISCHK  B      TYP2                                             7  04540  J 01607
```

```
PGLIN     LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION
1552                DCW    @VISUALLY CHECK THAT THE ACC,MOD,AND LOWER HEAD @   47  04593
1553                DC     @ARE SLTD AND THAT ALL OTHER ACC ARE INOP,IF SO ENT@ 50  04643
1554                DC     @ER 1,IF NOT ENTER 2@,G                     19  04662
1555                DC     @ @,G                                        1  04664
1556                BCE    START,*-13,2        BRCH IF ACC NOT PROPERLY SLTD 12  04666  B 03303 04664 2
1557                B      TYP1                                         7  04678  J 01593
1558                DCW    @TURN ON THE HAD,& CE-HAD SWITCHES,PRESS START@,G   45  04729
1559      WAIT      H                                                   1  04731  .
1560                ZA     &NOO,X3             LOAD IX 3               11  04732  M 09772 00039
```

```
PGLIN   LABEL   OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1562            THIS ROUTINE MAKES A QUICK CHECK OF THE FILE OPERATIONS USED IN
1563          THIS PROGRAM,HAO READ&WRITE AND SEEK OP,THIS IS DONE AT THE CE-
1564          CYLINDER.FAILURES DURING THIS ROUTINE WILL CAUSE THE PROGRAM TO
1565          ABORT ITS OPERATION.
1566          NOO       DCW     @N00@                             3  04743
1567                    S       TENCNT                            6  04746  S 10020
1568                    MLCA    LHADDR&1,CETRK&1   SET ACC&MOD ADDR  12  04752  D 09826 09901 T
1569                    MLCA    LHADDR&1,CETRKW&1                 12  04764  D 09826 09916 T
1570                    SO      1,CETRK            POSITION ACCESS  10  04776  M %F0 09900 R
1571                    BCB1    *-16                                7  04786  R 04776 2
1572                    BA1     *&1                                 7  04793  R 04800 GM
1573                    BCE     X-18,ONE2,1        BRCH IF USING 1301  12  04800  B 04914 03476 1
1574                    MLNA    ADDR14,X13         LOAD IX 13       12  04812  D 10009 00089 /
1575    W               MU      %F5,CETRK,R        CHECK POSITION RT CE-CYL  10  04824  M %F5 09900 R
1576                    BCB1    *-16                                7  04834  R 04824 2
1577                    BA1     *&1                                 7  04841  R 04848 GM
1578                    SW      E5                 TURN ON ERROR    6  04848  , 01806
1579                    BNT1    *&8                CHECK NO TRANSFER  7  04854  R 04868 SB
1580                    B       ERRCNT                              7  04861  J 08965
1581                    BER1    *&8                CHECK DATA CHECK  7  04868  R 04882 4
1582                    B       ERRCNT                              7  04875  J 08965
1583                    CW      E5                                  6  04882  ¤ 01806
1584    CEWRT           B       TYP1                                7  04888  J 01593
1585                    DCW     @TURN ON CE-WRT SW@,G              17  04911
1586                    H                          WAIT FOR CE ACTION  1  04913  .
1587                    S       TENCNT                            6  04914  S 10020
1588                    MLNA    ADDR15,X13         LOAD IX 13       12  04920  D 10014 00089 /
1589    X               MU      %F5,CETRKW,W       WRITE HA1        10  04932  M %F5 09915 W
1590                    BCB1    *-16                                7  04942  R 04932 2
1591                    BEX1    BIT81,M S          BRCH ON ERROR    7  04949  R 04970 SMG
1592                    BA1     *&1                                 7  04956  R 04963 GM
1593                    B       Y-18                                7  04963  J 04994
1594    BIT81           LU      %F5,CETRKW,W       TRY 8 BIT MODE   10  04970  L %F5 09915 W
1595                    BA1     *&1                                 7  04980  R 04987 GM
1596                    BEX1    ERRCNT,M S         BRCH ON ERROR    7  04987  R 08965 SM
1597                    S       TENCNT                            6  04994  S 10020
1598                    MLNA    ADDR16,X13         LOAD IX 13       12  05000  D 10019 00089 /
1599    Y               MU      %F5,CETRK,R        READ HA1         10  05012  M %F5 09900 R
```

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PGLIN     LABEL    OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1600               BAI    *&1                               7  05022  R 05029 GMSM
1601               BEXI   BIT82,SM   BRCH ON ANY BUT WLR     7  05029  R 05043 SM
1602               B      BIT82&24                          7  05036  J 05067
1603     BIT82     LU     %F5,CETRK,R  TRY 8 BIT MODE      10  05043  L %F5 09900 R
1604               BAI    *&1                               7  05053  R 05060 GMSM
1605               BEX1   ERRCNT,SM  BRCH ON ERROR          7  05060  R 08965 SM
1606               SW     E6                                6  05067  , 01807
1607               C      CETRK&12,@9#20@  CHECK ADDR READ 11  05073  C 09912 09776
1608               BU     ERRCNT     BRCH IF UNEQUAL        7  05084  J 08965 /
1609               CW     E6                                6  05091  ¤ 01807
1610               BCE    *&28,ONE2,1  BRCH IF USING 1301  12  05097  B 05136 03476 1
1611               B      TYP1                              7  05109  J 01593
1612               DCW    @TURN OFF CE-WRT SW@,G           18  05133
1613               H                 WAIT FOR CE ACTION     1  05135  .
1614               MLNS   AVALTR,FINAL&11                  12  05136  D 03674 06339 1
1615               MRCWG  LHADDR,UHADDR  LOAD FILE ADDR     12  05148  D 09825 09840 L
1616               MRCWG  LHADDR,VERADD                     12  05160  D 09825 09855 L
1617               MRCWG  LHADDR,TSTADD                     12  05172  D 09825 09870 L
1618               MRCWG  LHADDR,RDADDR                     12  05184  D 09825 09885 L
1619               BCE    INITAL,LOWHD-1,A  BRCH IF RESTORING ALTERNATES 12  05196  B 05215 03630 A
1620               B      UPIT                              7  05208  J 05269
1621     INITAL    A      @1@,UHADDR&6  ADJUST ADDR        11  05215  A 09738 09846
1622               MLCS   @8@,VERADD&6  RESET FLAG          12  05226  D 09777 09861 3
1623               MLCS   @8@,TSTADD&6                      12  05238  D 09777 09876 3
1624               MLCS   @8@,RDADDR&6                      12  05250  D 09777 09891 3
1625               B      *&12                              7  05262  J 05280
1626     UPIT      A      @1@,UHADDR&5  UPDATE FLAG ADDR   11  05269  A 09738 09845
1627               SW     TSTSW2                            6  05280  , 10085
1628               CW     TSTSW1                            6  05286  ¤ 10039
1629               BCE    BEGIN,FUNCTN,1  BRCH IF FLAG LOG ONLY 12  05292  B 05452 03530 1
1630               BCE    BEGIN,LOWHD-1,A  BRCH IF RESTORING ALTR 12  05304  B 05452 03630 A
1631               C      LOWHD,@00@  CHECK FOR HEAD 0     11  05316  C 03631 09753
1632               BE     *&19                              7  05327  J 05352 S
1633               S      @1@,VERADD&5  SET VERIFY ADDR    11  05334  S 09738 09860
1634               B      BEGIN                             7  05345  J 05452
1635               SW     SURF0                             6  05352  , 10040
1636               A      @3@,VERADD&5                     11  05358  A 09744 09860
1637               B      TYP2                              7  05369  J 01607
```

GO-NO GO TEST ON CE CYL

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1638		DCW	@ENTER HA1&FLAG FOR FIRST TRACK ON SURFACE 0 TO BE @		50	05425	
1639		DC	@FLAGGED@,G		7	05432	
1640		DCW	@ @,G		5	05438	
1641		MLNA	*-13,FLGO	MOVE FLAG & ADDR	12	05440	D 05438 07480 /
1642	BEGIN	ZA	ADDR9,X11	LOAD TX 11	11	05452	OM 09984 00079
1643		CW	EQHI&1,EQHI&8		11	05463	¤ 06107 06114
1644		CW	EQLO&1,EQLO&8		11	05474	¤ 06195 06202
1645		CW	LOFLGE&1,LOFLGE&8		11	05485	¤ 06563 06570
1646		CW	HIFLGE&1,HIFLGE&8		11	05496	¤ 06650 06657
1647		CW	BYPMSG&1		6	05507	¤ 05710
1648		S	CYLCNT-1		6	05513	S 10044
1649		ZA	&NO1,X3	LOAD IX 3	11	05519	OM 09782 00039
1650		S	TRKCNT		6	05530	S 10084
1651		S	CYLMSG&6	RESET CYL MSG COUNT	6	05536	S 08486
1652		BCE	NO1,FUNCTN,2	BRCH IF RESTORING ADDR	12	05542	B 05584 03530 2
1653		B	TYP1		7	05554	J 01593
1654		DCW	@TURN ON WRITE INHIBIT@,G		21	05581	
1655		H			1	05583	.

```
PGLIN     LABEL     OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1657                       THIS ROUTINE POSITIONS THE ACCESS FROM ONE CYLINDER TO THE NEXT
1658                     AS THE PROGRAM PROGRESSES THROUGH THE FILE.IF THE CE-HAO SWITCH
1659                     IS OFF THE POSITIONING IS VERIFIED.FAILURES IN THIS ROUTINE WILL
1660                     CAUSE THE PROGRAM TO ABORT ITS OPERATION.
1661      NO1        DCW    @NO1@                             3  05584
1662                 S      TENCNT                            6  05587  S 10020
1663                 MLNA   ADDR1,X13        STORE RETURN ADDR 12  05593  D 09934 00089 /
1664      POSACC     SD     1,VERADD         POSITION ACC     10  05605  M %F0 09855 R
1665                 BCB1   *-16                               7  05615  R 05605 2
1666                 BA1    *&1                               7  05622  R 05629 GMS
1667                 BEX1   ERRCNT,SM        BRCH ON ERROR     7  05629  R 08965 M
1668      GO1        S      TENCNT                            6  05636  S 10020
1669                 MU     %F5,VERADD,R     VERIFY ACC POSITION 10 05642  M %F5 09855 R
1670                 BCB1   *-16                               7  05652  R 05642 2
1671                 BA1    *&1                               7  05659  R 05666 GMS
1672                 BNT1   *&8              CHECK FOR NO-RECORD-FOUND 7 05666  R 05680 B
1673                 B      *&8                               7  05673  J 05687
1674                 BEF1   ERRCNT                            7  05680  R 08965 8
1675      NO1XIT     B      MONITR                            7  05687  J 02054
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1677                THIS ROUTINE READS THE HA1 ADDRESSES OF ALL THE DATA TRACKS AND
1678              ALTERNATES LOGGING ALL LEGAL FLAGS AND REPORTING ALL ILLEGAL
1679              FLAG CONDITIONS.IF SURFACES ARE BEING RESTORED THIS ROUTINE
1680              DETERMINES IF THEY SHOULD BE FLAGGED.
1681       NO2    DCW    @NO2@                                     3  05694
1682              BW     NO2XIT,TSTSW1      BRCH IF TEST SW 1 IS ON 12  05697  V 07328 10039 1
1683       BYPMSG NOPWM                                            1  05709  N
1684              B      BYPASS                                    7  05710  J 05806
1685              B      TYP1                                      7  05717  J 01593
1686              DCW    @FLAGGING ERROR LOG@,G                   18  05741
1687              B      TYP1                                      7  05743  J 01593
1688              DCW    @ ALTER TRK   HA1   DATA TRK HA1   FLG   ERR TYPE@ 49  05798
1689              DCW    @M@                                       1  05799
1690              SW     BYPMSG&1                                  6  05800  , 05710
1691       BYPASS CW     EQHI&1,EQHI&8      CLEAR SWITCHES         11  05806  ¤ 06107 06114
1692              CW     EQLO&1,EQLO&8                             11  05817  ¤ 06195 06202
1693              CW     LOFLGE&1,LOFLGE&8                         11  05828  ¤ 06563 06570
1694              CW     HIFLGE&1,HIFLGE&8                         11  05839  ¤ 06650 06657
1695              MRCWG  VERADD,TSTADD      SET UP TEST ADDR       12  05850  D 09855 09870 DL
1696              ZA     ADDR4,X9                                  11  05862  M 09949 00069 QM
1697              ZA     @00000@,X10        LOAD IX 10             11  05873  M 09787 00074 QM
1698       SETFLG S      TENCNT                                    6  05884  S 10020
1699              MLNA   ADDR2,X13                                 12  05890  D 09939 00089 /
1700              MLNS   FLGTRK&X10,TSTADD&6  SET FLAG CHAR        12  05902  D 10L3 09876 1
1701              BCE    *&8,LOWHD-1,A      BRCH IF RESTORING ALTR SURF 12  05914  B 05933 03630 A
1702              B      RDALT                                     7  05926  J 06011
1703              SW     LOWHD,UHADDR&6                            11  05933  , 03631 09846
1704              BCE    RDALT,FUNCTN,1     BRCH IF FLAG LOG ONLY  12  05944  B 06011 03530 1
1705              C      TSTADD&6,LOWHD     IS THIS TEST SURFACE   11  05956  C 09876 03631
1706              BCE    *&8,LOWHD-1,A      BRCH IF RESTORING ALTERNATES 12  05967  B 05986 03630 A
1707              B      RDALT                                     7  05979  J 06011
1708              BE     NXTFLG&12                                 7  05986  J 06294 S
1709              C      TSTADD&6,UHADDR&6                         11  05993  C 09876 09846
1710              BE     NXTFLG&12                                 7  06004  J 06294 S
1711       RDALT  MU     %F5,TSTADD,R       READ HA1 FROM THE FILE 10  06011  M %F5 09870 R
1712              BAI    *&1                                       7  06021  R 06028 MG
1713       GO2    BCE    NXTFLG,FUNCTN,1    BRCH IF FLG LOG ONLY   12  06028  B 06282 03530 1
1714              BCE    NXT[illegible]G,LOW[illegible]-1,A  BRC[illegible]F A[illegible]R RE[illegible]CED 12  [illegible]040  062  036  A
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                    LOCATE AND LOG FLAGS
PGLIN     LABEL     OPCOD  OPERAND
1715                SW     TSTADD&9
1716                BW     CHKHI,SURF0          BRCH IF TESTING SURF 0
1717                C      LHADDR&5,TSTADD&12 CHECK ADDR ON ALTR TO LOW SURF
1718                BE     EQLO                 IF HAI EQUAL BRCH
1719      CHKHI     C      UHADDR&5,TSTADD&12 CHECK ADDR ON ALTER TO HI SURF
1720                BU     NXTFLG               IF HAI IS NOT EQUAL BRCH
1721      EQHI      NOPWM
1722                B      ALTERR
1723                DC     @J@
1724                DC     NXTFLG&24
1725                DC     @ @
1726                SW     EQHI&1,EQHI&8
1727                MLNS   TSTADD&6,UHADDR&13 MOVE FLAG TO ADDRESS
1728                MRCWG  TSTADD&9,0&X11       STORE ADDR IN LOG
1729                SBR    X11
1730                MLNS   TSTADD&6,99998&X11 STORE FLAG
1731                MLCA   @* @,0&X11           FLAG HAI
1732                B      NXTFLG&24
1733      EQLO      NOPWM
1734                B      ALTERR
1735                DC     @J@
1736                DC     NXTFLG&24
1737                DC     @ @
1738                SW     EQLO&1,EQLO&8
1739                MLNS   TSTADD&6,LHADDR&13 MOVE FLAG TO ADDR
1740                MRCWG  TSTADD&9,0&X11       STORE ADDR IN LOG
1741                SBR    X11
1742                MLNS   TSTADD&6,99998&X11 STORE FLAG IN LOG
1743                MLCS   @* @,0&X11           FLAG HAI
1744                B      NXTFLG&24
1745      NXTFLG    MLCWA  TSTADD&13,5&X9       SAVE ALTER ADDR
1746                MLCS   TSTADD&6,5&X9        SAVE ALTER ADDR
1747                A      @1@,X10              UPDATE IX 10
1748                A      @6@,X9               UPDATE IX 9
1749      FINAL     BCE    *&8,X10,G            BRCH IF ALL ALTER READ
1750                B      SETFLG
1751                MLCA   CYLCNT,TSTADD&6      RESET TEST ADDR
1752                MLNA   ADDR3,X13
```

```
CT  ADDRS  INSTRUCTION
 6  06052  , 09879
12  06058  V 06088 10040 1
11  06070  C 09830 09882
 7  06081  J 06194 S
11  06088  C 09845 09882
 7  06099  J 06282 /
 1  06106  N
 7  06107  J 09178
 1  06114
 5  06119  06306
 1  06120
11  06121  , 06107 06114
12  06132  D 09876 09853 1
12  06144  D 09879 00.MQ L
 7  06156  G 00079 B
12  06163  D 09876 99R18 1
12  06175  D 09789 00.MQ T
 7  06187  J 06306
 1  06194  N
 7  06195  J 09178
 1  06202
 5  06207  06306
 1  06208
11  06209  , 06195 06202
12  06220  D 09876 09838 1
12  06232  D 09879 00.MQ L
 7  06244  G 00079 B
12  06251  D 09876 99R18 1
12  06263  D 09789 00.MQ 3
 7  06275  J 06306
12  06282  D 09883 00.*5 X
12  06294  D 09876 00.*5 3
11  06306  A 09738 00074
11  06317  A 09790 00069
12  06328  B 06347 00074 G
 7  06340  J 05884
12  06347  D 10045 09876 T
12  06359  D 09944 00089 /
```

LOCATE AND LOG FLAGS

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1753	SETADR	S	TENCNT	RESET TEN COUNT	6	06371	S 10020
1754		SW	TSTADD&2		6	06377	, 09872
1755		CW	TSTADD&9		6	06383	¤ 09879
1756		BCE	RDDASF,FUNCTN,1	BRCH IF FLAG LOG ONLY	12	06389	B 06449 03530 1
1757		BCE	RDDASF,LOWHD-1,A	BRCH IF RESTORING ALTERNATES	12	06401	B 06449 03630 A
1758		C	UHADDR&5,TSTADD&5	IS THIS THE AFFECTED HEAD	11	06413	C 09845 09875
1759		BE	NXTDT	IF SO BRCH	7	06424	J 07074 S
1760		C	LHADDR&5,TSTADD&5	IS THIS THE AFFECTED HEAD	11	06431	C 09830 09875
1761		BE	NXTDT	IF SO BRCH	7	06442	J 07074 S
1762	RDDASF	MU	%F5,TSTADD,R	READ A HOME ADDR	10	06449	M %F5 09870 R
1763		BAL	*&1		7	06459	R 06466 M G
1764		SW	TSTADD&9		6	06466	, 09879
1765	GO3	BCE	NXTDT,TSTADD&13,8	BRCH IF NO FLG	12	06472	B 07074 09883 8
1766		BCE	CHKFLG,FUNCTN,1	BRCH IF FLAG LOG ONLY	12	06484	B 06736 03530 1
1767		BCE	*&8,LOWHD-1,A	BRCH IF ALTER REPLACED	12	06496	B 06515 03630 A
1768		B	CHKFLG		7	06508	J 06736
1769		SW	TSTADD&13,TSTADD&2		11	06515	, 09883 09872
1770		C	UHADDR&6,TSTADD&13	CHECK FOR EQUAL FLAGS	11	06526	C 09846 09883
1771		BE	HIFLGE		7	06537	J 06649 S
1772		C	LHADDR&6,TSTADD&13	CHECK FOR EQUAL FLAGS	11	06544	C 09831 09883
1773		BU	CHKFLG		7	06555	J 06736 /
1774	LOFLGE	NOPWM			1	06562	N
1775		B	FLGERR		7	06563	J 09301
1776		DC	@J@		1	06570	
1777		DC	NXTDT		5	06575	07074
1778		DC	@ @		1	06576	
1779		MLNA	TSTADD&5,LHADDR&12	MOVE ADDR TO WRITE FLD	12	06577	D 09875 09837 /
1780		MRCWG	TSTADD&9,0&X11	MOVE ADDR TO FLG LOG	12	06589	D 09879 00.MO Q D L
1781		SBR	X11		7	06601	G 00079 8
1782		A	@1@,X11	UPDATE X 11	11	06608	A 09738 00079
1783		MLCA	@** @,0&X11	FLAG HAL	12	06619	D 09793 00.MO Q T
1784		SW	LOFLGE&1,LOFLGE&8	TURN ON ERROR SWITCHES	11	06631	, 06563 06570
1785		B	NXTDT		7	06642	J 07074
1786	HIFLGE	NOPWM			1	06649	N
1787		B	FLGERR		7	06650	J 09301
1788		DC	@J@		1	06657	
1789		DC	NXTDT		5	06662	07074
1790		DC	@ @		1	06663	

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1791		MLNA	TSTADD&5,UHADDR&12	MOVE ADDR TO WRITE FLD	12	06664	D 09875 09852 /
1792		MRCWG	TSTADD&9,0&X11	MOVE ADDR TO FLG LOG	12	06676	D 09879 00.Q0 D .MO L
1793		SBR	X11		7	06688	G 00079 B
1794		A	@1@,X11	UPDATE X 11	11	06695	A 09738 00079
1795		MLCA	@** @,0&X11	FLAG HA1	12	06706	D 09793 00.Q .MO T
1796		SW	HIFLGE&1,HIFLGE&8		11	06718	, 06650 06657
1797		B	NXTDT		7	06729	J 07074
1798	CHKFLG	SW	TSTADD&9		6	06736	, 09879
1799		MLNS	TSTADD&13,*&12	MOVE FLAG CHAR	12	06742	D 09883 06765 1
1800		BCE	ALTR6,FLGTRK&5,	BRCH IF FLG 7	12	06754	B 06970 10038
1801		BCE	ALTR5	BRCH IF FLG 6	6	06766	B 06938
1802		BCE	ALTR4	BRCH IF FLG 5	6	06772	B 06906
1803		BCE	ALTR3	BRCH IF FLG 4	6	06778	B 06874
1804		BCE	ALTR2	BRCH IF FLG 2	6	06784	B 06842
1805		BCE	ALTR1	BRCH IF FLG 1	6	06790	B 06810
1806		B	ILLFLG		7	06796	J 09528
1807		B	NXTDT		7	06803	J 07074
1808	ALTR1	C	ALTLOG&4,TSTADD&12	COMPARE HA1S	11	06810	C 10051 09882
1809		BE	LOGIT	BRCH IF EQUAL	7	06821	J 07002 S
1810		B	HAFERR		7	06828	J 09424
1811		B	NXTDT		7	06835	J 07074
1812	ALTR2	C	ALTLOG&10,TSTADD&12	COMPARE HA1@S	11	06842	C 10057 09882
1813		BE	LOGIT	BRCH IF EQUAL	7	06853	J 07002 S
1814		B	HAFERR		7	06860	J 09424
1815		B	NXTDT		7	06867	J 07074
1816	ALTR3	C	ALTLOG&16,TSTADD&12	COMPARE HA1@S	11	06874	C 10063 09882
1817		BE	LOGIT	BRCH IF EQUAL	7	06885	J 07002 S
1818		B	HAFERR		7	06892	J 09424
1819		B	NXTDT		7	06899	J 07074
1820	ALTR4	C	ALTLOG&22,TSTADD&12	COMPARE HA1@S	11	06906	C 10069 09882
1821		BE	LOGIT	BRCH IF EQUAL	7	06917	J 07002 S
1822		B	HAFERR		7	06924	J 09424
1823		B	NXTDT		7	06931	J 07074
1824	ALTR5	C	ALTLOG&28,TSTADD&12	COMPARE HA1@S	11	06938	C 10075 09882
1825		BE	LOGIT	BRCH IF EQUAL	7	06949	J 07002 S
1826		B	HAFERR		7	06956	J 09424
1827		B	NXTDT		7	06963	J 07074

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PGLIN  LABEL   OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1828   ALTR6   C      ALTLOG&34,TSTADD&12  COMPARE HA1@S  11  06970  C 10081 09882
1829           BE     LOGIT                BRCH IF EQUAL   7  06981  J 07002 S
1830           B      HAFERR                               7  06988  J 09424
1831           B      NXTDT                                7  06995  J 07074
1832   LOGIT   SBR    X8                   STORE ADDR      7  07002  G 00064 B
1833           S      @13@,X8              ALTER ADDR     11  07009  S 09795 00064
1834           MLNB   0&X8,X8              MOVE ADDR OF ADDR IN ALT LOG  12  07020  D 00.00 00064 J
1835           MLCA   @XXXX@,0&X8          RESET ADDR     12  07032  D 09799 00.00 I
1836           MRCWG  TSTADD&9,0&X11       STORE ADDR IN FLAG LOG  12  07044  D 09879 00.MO L
1837           SBR    X11                                  7  07056  G 00079 B
1838           S      @1@,X11              CORRECT FLAG LOG ADDR  11  07063  S 09738 00079
1839   NXTDT   SW     TSTADD&2                             6  07074  , 09872
1840           A      @1@,TSTADD&5         UPDATE TRACK ADDR  11  07080  A 09738 09875
1841           A      @1@,TRKCNT           UPDATE TRACK COUNT  11  07091  A 09738 10084
1842           C      TRKCNT,@40@          HAVE 40 HEADS BEEN TRIED  11  07102  C 10084 09801
1843           BU     SETADR               IF NOT BRCH     7  07113  J 06371 /
1844           S      TRKCNT               RESET TRACK COUNT  6  07120  S 10084
1845           C      ALTLOG&4,@XXXX@      IS THERE AN ADDR  11  07126  C 10051 09799
1846           BU     POSERR               IF SO BRCH      7  07137  J 07241 /
1847           C      ALTLOG&10,@XXXX@     IS THERE AN ADDR  11  07144  C 10057 09799
1848           BU     POSERR                               7  07155  J 07241 /
1849           C      ALTLOG&16,@XXXX@     IS THERE AN ADDR  11  07162  C 10063 09799
1850           BU     POSERR                               7  07173  J 07241 /
1851           C      ALTLOG&22,@XXXX@                    11  07180  C 10069 09799
1852           BU     POSERR                               7  07191  J 07241 /
1853           C      ALTLOG&28,@XXXX@     IS THERE AN ADDR  11  07198  C 10075 09799
1854           BU     POSERR                               7  07209  J 07241 /
1855           C      ALTLOG&34,@XXXX@     IS THERE AN ADDR  11  07216  C 10081 09799
1856           BU     POSERR                               7  07227  J 07241 /
1857           B      NO2XIT                               7  07234  J 07328
1858   POSERR  SBR    X8                   SAVE ADDR       7  07241  G 00064 B
1859           SBR    X9                                   7  07248  G 00069 B
1860           S      @13@,X9              ADJUST ADDR    11  07255  S 09795 00069
1861           MLNB   0&X9,X10             MOVE ADDR OF ADDR IN ALT LOG  12  07266  D 00.*0 00074 J
1862           C      0&X10,CYLCNT-1       IS THIS A FREE SURFACE  11  07278  C 00.'0 10044
1863           BE     FLREST                               7  07289  J 07321 S
1864           BH     FLREST                               7  07296  J 07321 U
1865           C      0&X10,TSTADD&5       IS THIS A FREE SURFACE  11  07303  C 00.'0 09875
```

PGLIN	LABEL	LOCATE AND LOG FLAGS OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1866		BH	HAAERR	IF NOT BRCH	7	07314	J 09602 U
1867	FLREST	B	O&X8		7	07321	J 00.00
1868	NO2XIT	B	MONITR		7	07328	J 02054

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PGLIN  LABEL   OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1870           WHEN ADDRESSES ARE TO BE RESTORED ON TWO SURFACES EFFECTED BY
1871         THE REPLACEMENT OF A DRAWER THIS ROUTINE RE-WRITES AND VERIFIES
1872         THE ADDRESSES.FLAGGING DATA FROM THE LOG ROUTINE IS USED IF THE
1873         TRACK IS TO BE REFLAGGED.FAILURES WILL CAUSE THE PROGRAM TO ABORT
1874   NO3     DCW    @NO3@                                     3  07335
1875           S      TENCNT                                    6  07338  S 10020
1876           BCE    NO3XIT,FUNCTN,1    BRCH IF FLAG LOG ONLY 12  07344  B 07883 03530 1
1877           BW     NO3XIT,TSTSW1      BRCH IF TEST SW 2 IS ON 12  07356  V 07883 10039 1
1878           C      LOWHD,@00@         IS SURFACE 0 BEING RESTORED 11  07368  C 03631 09753
1879           BU     GO4                BRCH UNEQUAL              7  07379  J 07482 /
1880           C      LHADDR&5,FLGO-1    WILL THIS TRACK BE FLAGGED 11  07386  C 09830 07479
1881           BU     GO4                IF NOT BRCH               7  07397  J 07482 /
1882           MLNS   FLGO,LHADDR&13     MOVE FLAG CHAR            12  07404  D 07480 09838 1
1883           B      TYP2                                         7  07416  J 01607
1884           DCW    @ENTER HA1 & FLAG CHAR FOR NEXT ON SURF 00 TO BE @  48  07470
1885           DC     @FLGD@,G                                     4  07474
1886   FLGO    DCW    @      @,G                                   5  07480
1887   GO4     BCE    *&25,LOWHD-1,A     BRCH IF RESTORING ALTR TRKS 12  07482  B 07518 03630 A
1888           SW     LHADDR&2,UHADDR&2                           11  07494  , 09827 09842
1889           MLNA   LHADDR&5,LHADDR&12 LOAD ADDR TO BE WRITTEN  12  07505  D 09830 09837 /
1890           MLNA   UHADDR&5,UHADDR&12 LOAD ADDR TO BE WRITTEN  12  07517  D 09845 09852 /
1891           MLNB   LHADDR&13,SAVLOW   SAVE HA1 & FLAG           12  07529  D 09838 10090 J
1892           MLNB   UHADDR&13,SAVHI                             12  07541  D 09853 10095 J
1893           MLNA   ADDR12,X13                                  12  07553  D 09999 00089 /
1894   WRTLAD  MU     %F5,LHADDR,W       WRITE HA1 ON LOWER SURF  10  07565  M %F5 09825 W
1895           BA1    *&1                                         7  07575  R 07582 GM
1896           BEX1   BIT83,SM           BRCH ON ERROR             7  07582  R 07596 SM
1897           B      GO5                                         7  07589  J 07620
1898   BIT83   LU     %F5,LHADDR,W       TRY 8 BIT MODE           10  07596  L %F5 09825 W
1899           BA1    *&1                                         7  07606  R 07613 GM
1900           BEX1   ERRCNT,SM          BRCH ON ERROR             7  07613  R 08965 SM
1901   GO5     S      TENCNT                                      6  07620  S 10020
1902           MLNA   ADDR13,X13                                  12  07626  D 10004 00089 /
1903   WRTHI   MU     %F5,UHADDR,W       WRITE THE HA1 ON THE UPPER SURF  10  07638  M %F5 09840 W
1904           BA1    *&1                                         7  07648  R 07655 GM
1905           BEX1   BIT84,SM           BRCJ ON ERROR             7  07655  R 07669 SM
1906           B      GO6                                         7  07662  J 07693
```

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1907	BIT84	LU	%F5,UHADDR,W	TRY 8 BIT MODE	10	07669	L %F5 09840 W
1908		BAL	*&1		7	07679	R 07686 GM
1909		BEX1	ERRCNT	BRCH ON ERROR	7	07686	R 08965
1910	GO6	S	TENCNT		6	07693	S 10020
1911		MLNA	ADDR5,X13		12	07699	D 09954 00089 /
1912		MRCWG	LHADDR,RDADDR	LOAD READ ADDR	12	07711	D 09825 09885 DL
1913	RDLOW	MU	%F5,RDADDR,R	READ THE ADDR WRITTEN ON LO SURF	10	07723	M %F5 09885 R
1914		BAL	*&1		7	07733	R 07740 GM
1915	GO7	S	TENCNT		6	07740	S 10020
1916		C	RDADDR&13,SAVLOW	CHECK ADDR READ BACK	11	07746	C 09898 10090
1917		SW	E2	TURN ON ERROR 2	6	07757	, 01803
1918		BU	ERRCNT	IF UNEQUAL BRCH	7	07763	J 08965 /
1919		CW	E2	TURN OFF E2	6	07770	¤ 01803
1920	GO8	S	TENCNT		6	07776	S 10020
1921		MLNA	ADDR6,X13		12	07782	D 09959 00089 /
1922		MRCWG	UHADDR,RDADDR	LOAD READ ADDR	12	07794	D 09840 09885 DL
1923	RDHI	MU	%F5,RDADDR,R	READ ADDR WRITTEN ON HI SURF	10	07806	M %F5 09885 R
1924		BAL	*&1		7	07816	R 07823 GM
1925	GO9	S	TENCNT		6	07823	S 10020
1926		C	RDADDR&13,SAVHI	CHECK ADDR READ	11	07829	C 09898 10095
1927		SW	E3	TURN ON ERROR 3	6	07840	, 01804
1928		BU	ERRCNT		7	07846	J 08965 /
1929		CW	E3	TURN OFF ERROR 3	6	07853	¤ 01804
1930	GO10	MLCA	@00008@,LHADDR&13	RESET ADDR	12	07859	D 09806 09838 T
1931		MLCA	@00008@,UHADDR&13		12	07871	D 09806 09853 T
1932	NO3XIT	B	MONITR		7	07883	J 02054

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1934			IF ADDRESSES HAVE BEEN RESTORED THE PROGRAM MAKES A SECOND PASS				
1935			THROUGH THE MODULE WITH THE CE-HAO SWITCH OFF.THIS ROUTINE REPORT				
1936			S ANY ADDRESS ERRORS-NO RECORD FOUNDS-DURING THE SECOND PASS.				
1937	NO4	DCW	@NO4@		3	07892	
1938		BW	NO4XIT,TSTSW2	BRCH IF TSTSW IS ON	12	07893	V 08082 10085 1
1939		BCE	NO4XIT,FUNCTN,1	BRCH IF FUNCTION IS FLAG LOG ONLY	12	07905	B 08082 03530 1
1940		S	TRKCNT		6	07917	S 10084
1941		S	TENCNT		6	07923	S 10020
1942		MLNA	CYLCNT,TSTADD&6	LOAD TEST ADDR	12	07929	D 10045 09876 /
1943		MLNA	ADDR7,X13	LOAD IX 13	12	07941	D 09964 00089 /
1944	VERADS	MU	%F5,TSTADD,R	VERIFY ADDR	10	07953	M %F5 09870 R
1945		BAI	*&1		7	07963	R 07970 G M
1946		SW	E4	TURN ON ERROR 4	6	07970	, 01805
1947	GO11	BNT1	*&8	CHECK FOR NO TRANSFER-NO-REC-FND	7	07976	R 07990 S B
1948		B	*&8		7	07983	J 07997
1949		BEF1	*&14	BRCH ON A NO RECORD FOUND	7	07990	R 08010 8
1950		CW	E4		6	07997	¤ 01805
1951		B	*&26		7	08003	J 08035
1952		SW	EXTRA&1		6	08010	, 02920
1953		MRCWG	TSTADD,DATA	LOAD DATA	12	08016	D 09870 01710 U L
1954		B	MONITR	GO REPORT ERROR	7	08028	J 02054
1955		A	@1@,TSTADD&5	UPDATE TEST ADDR	11	08035	A 09738 09875
1956		A	@1@,TRKCNT		11	08046	A 09738 10084
1957		C	TRKCNT,@40@	CHECK FRO END OF CYLINDER	11	08057	C 10084 09801
1958		BE	*&8		7	08068	J 08082 S
1959		B	VERADS		7	08075	J 07953
1960	NO4XIT	B	MONITR		7	08082	J 02054

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PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1962            THIS ROUTINE UPDATES THE FILE ADDRESS AND DETERMINES WHEN THE
1963          RUN IS COMPLETE.ITALSO FORMATS AND TYPES OUT THE FLAG LOG AT THE
1964           COMPLETION OF THE RUN.
1965      NO5         DCW    @NO5@                                     3  08091
1966                  SW     LHADDR&2,UHADDR&2                        11  08092  , 09827 09842
1967                  A      @40@,LHADDR&5      UPDATE AFFECTED SURFACE TRACK  11  08103  A 09801 09830
1968                  A      @40@,UHADDR&5        ADDRESSES FOR NEXT CYL      11  08114  A 09801 09845
1969                  SW     RDADDR&2,VERADD&2                        11  08125  , 09887 09857
1970                  A      @40@,RDADDR&5      UPDATE SUPPORT ADDRESSES      11  08136  A 09801 09890
1971                  MLCS   @+@,0&X11          SET CYL DELIMITER             12  08147  D 09734 00.Q0 3
1972                  A      @1@,X11                                  11  08159  A 09738 00079
1973                  A      @40@,VERADD&5                            11  08170  A 09801 09860
1974                  A      @40@,CYLCNT-1      UPDATE CYLINDER COUNT         11  08181  A 09801 10044
1975                  BZ     *&8                                       7  08192  J 08206 V
1976                  B      NO1                GO PROCESS NEXT CYLINDER       7  08199  J 05584
1977                  BW     PRTLOG,TSTSW1      BRCH IF TEST SW IS ON         12  08206  V 08288 10039 1
1978                  SW     TSTSW1                                    6  08218  , 10039
1979                  CW     TSTSW2                                    6  08224  ¤ 10085
1980                  B      TYP1                                      7  08230  J 01593
1981                  DCW    @TURN OFF CE-HAO SW,PRESS START@,G       30  08266
1982                  H                         WAIT FOR CE ACTION     1  08268  .
1983                  BCE    *&8,FUNCTN,1       BRCH IF FLAG LOG ONLY         12  08269  B 08288 03530 1
1984                  B      NO1                                       7  08281  J 05584
1985      PRTLOG      MLNS   CMA-2,HDRMSG&32    MOVE CHL NUMBER               12  08288  D 03573 08363 1
1986                  MLNS   CMA-1,HDRMSG&17    MOVE MOD NUMBER               12  08300  D 03574 08348 1
1987                  MLNS   CMA,HDRMSG&23      MOVE ACC NUMBER               12  08312  D 03575 08354 1
1988                  B      TYP1                                      7  08324  J 01593
1989       HDRMSG     DCW    @FLAG LOG FOR MOD  ,ACC  ,ON CHL  @,G       33  08331
1990                  B      TYP1                                      7  08365  J 01593
1991                  DCW    @       HA1    FLAG CHAR@,G               23  08394
1992                  ZA     ADDR9,X10          LOAD IX 10&9             11  08396  Q M 09984 00074
1993      LOCYL       BCE    *&8,0&X10,*        BRCH IF NO FLGS IN THIS CYL   12  08407  B 08426 00.00 *
1994                  B      PRTLNE                                    7  08419  J 08473
1995                  A      @1@,X10            UPDATE IX 10             11  08426  A 09738 00074
1996                  A      @1@,CYLMSG&6       UPDATE CYL MSG           11  08437  A 09738 08486
1997                  C      CYLMSG&6,@250@     HAVE 250 CYL BEEN LOGGED  11  08448  C 08486 09809
1998                  BE     ENDTST                                    7  08459  J 08687 S
1999                  B      LOCYL                                     7  08466  J 08407
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PGLIN  LABEL    OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
2000   PRTLNE   B      TYP1                                              7  08473  J 01593
2001    CYLMSG  DCW    @CYL @                                            4  08480
2002            DCW    @000@,G                                           3  08486
2003   PREPMG   MLNA   3&X10,FLGLNE&10     MOVE ADDR TO PRINT LINE        12  08488  D 00::3 08635 /
2004            A      @4@,X10            UPDATE X10                    11  08500  A 09810 00074
2005            MLNS   0&X10,FLGLNE&18    MOVE FLAG CHAR                12  08511  D 00::0 08643 1
2006            A      @1@,X10                                          11  08523  A 09738 00074
2007            BCE    *&8,0&X10,*        CHECK FOR AFFECTED TRACK FLAG  12  08534  B 08553 00::0 *
2008            B      LNERDY                                            7  08546  J 08618
2009            MLCS   0&X10,FLGLNE&21    MOVE *                        12  08553  D 00::0 08646 3
2010            A      @1@,X10                                          11  08565  A 09738 00074
2011            BCE    *&8,0&X10,*                                      12  08576  B 08595 00::0 *
2012            B      LNERDY                                            7  08588  J 08618
2013            MLCS   0&X10,FLGLNE&22    MOVE *                        12  08595  D 00::0 08647 3
2014            A      @1@,X10                                          11  08607  A 09738 00074
2015   LNERDY   B      TYP1                                              7  08618  J 01593
2016    FLGLNE  DCW    @                       @,G .                    23  08625
2017            MLCA   @  @,FLGLNE&22     RESET ** IN MSG               12  08649  D 09812 08647 T
2018            BCE    LOCYL,0&X10,*      IS THAT ALL FOR THIS CYL      12  08661  B 08407 00::0 *
2019            B      PREPMG                                            7  08673  J 08488
2020            B      PREPMG                                            7  08680  J 08488
2021   ENDTST   B      TYP1                                              7  08687  J 01593
2022            DCW    @ @,G                                             1  08694
2023            BCE    SWOFF,FUNCTN,1     BRCH IF FLAG LOG ONLY         12  08696  B 08840 03530 1
2024            B      TYP1                                              7  08708  J 01593
2025            DCW    @* FLAGS RESTORED ON THE AFFECTED DATA SURFACES@,G  46  08760
2026            B      TYP1                                              7  08762  J 01593
2027            DCW    @** HOME ADDRESSES RESTORED ON THE AFFECTED ALTER@  48  08816
2028            DC     @NATE SURFACES@,G                                 13  08829
2029            B      TYP1                                              7  08831  J 01593
2030            DCW    @ @,G                                             1  08838
2031   SWOFF    B      TYP1                                              7  08840  J 01593
2032            DCW    @INSURE HAO,CE-HAO,& CE-WRT SWS ARE OFF,PROG RUN IS@  50  08896
2033            DC     @ COMPLETED@                                      10  08906
2034            DC     @,PRESS START TO CALL NEXT PROGRAM@,G             33  08939
2035            CS     2099                                              6  08941  / 02099
2036            CS     3099                                              6  08947  / 03099
2037            CS     START&10                                          6  08953  / 03313
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PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
2038		H	400	WAIT FOR CE ACTION	6	08959	. 00400

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PGLIN  LABEL   OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2040   ERRCNT  A      @1@,TENCNT          COUNT TEN PASSES     11  08965  A 09738 10020
2041           BZ     ABORT               BRCH AFTER TEN PASSES 7  08976  J 08990 V
2042           B      0&X13               RETURN TO I/O OP      7  08983  J 00M+0 Q
2043   ABORT   BAL    STACHK              GO REPORT ERRORS      7  08990  R 03001 G M
2044           B      MONITR                                    7  08997  J 02054
2045           B      TYP1                                      7  09004  J 01593
2046           DCW    @THE ERROR INDICATED OCCURRED 10 TIMES CONSEC@      44  09054
2047           DC     @UTIVELY AND THE PROGRAM RUN IS BEING TERMINATED. @ 49  09103
2048           DC     @PRESS START TO CALL IN THE NEXT DIAG.@,G           37  09140
2049           CS     2099                                      6  09142  / 02099
2050           CS     3099                                      6  09148  / 03099
2051           CS     START&10                                  6  09154  / 03313
2052           MLNA   @00400@,6           ALTER RESTART INST   12  09160  D 09817 00006 /
2053           H      400                 WAIT FOR CE ACTION    6  09172  . 00400
2054   ALTERR  SBR    GOBACK&5            SAVE RETURN ADDR      7  09178  G 09730 B
2055           MLNA   TSTADD&12,FLGMSG&16                       12  09185  D 09882 09692 /
2056           MLNS   TSTADD&6,FLGMSG&5   MOVE FLAG CHAR        12  09197  D 09876 09681 1
2057           MLCS   @5@,FLGMSG&44       MOVE ERROR TYPE      12  09209  D 09818 09720 3
2058           C      GOBACK&5,ADDR10     WAS IT THE UPPER SURF 11  09221  C 09730 09989
2059           BE     *&32                                      7  09232  J 09270 S
2060           MLNS   LHADDR&13,FLGMSG&37 MOVE FLAG OF DATA TRCK 12  09239  D 09838 09713 1
2061           MLNA   LHADDR&12,FLGMSG&29 MOVE ADDR OF DATA TRCK 12  09251  D 09837 09705 /
2062           B      PRTFM                                     7  09263  J 09669
2063           MLNS   UHADDR&13,FLGMSG&37 MOVE FLAG OF DATA TRCK 12  09270  D 09853 09713 1
2064           MLNA   UHADDR&12,FLGMSG&29 MOVE ADDR OF DATA TRCK 12  09282  D 09852 09705 /
2065           B      PRTFM                                     7  09294  J 09669
2066   FLGERR  SBR    GOBACK&5            SAVE RETURN ADDR      7  09301  G 09730 B
2067           MLCS   @2@,FLGMSG&44       MOVE ERROR TYPE      12  09308  D 09751 09720 3
2068           MLNA   TSTADD&12,FLGMSG&29 MOVE ADDR OF DATA TRCK 12  09320  D 09882 09705 /
2069           MLNA   TSTADD&13,FLGMSG&37 MOVE FLAG OF DATA TRCK 12  09332  D 09883 09713 /
2070           C      GOBACK&5,ADDR11     WAS IT LOW ALTER SURF 11  09344  C 09730 09994
2071           BE     *&32                                      7  09355  J 09393 S
2072           MLNS   UHADDR&6,FLGMSG&5   MOVE FLAG OF ALTER TRK 12  09362  D 09846 09681 1
2073           MLNA   UHADDR&12,FLGMSG&16 MOVE ADDR OF ALTR TRK 12  09374  D 09852 09692 /
2074           B      PRTFM                                     7  09386  J 09669
2075           MLNS   LHADDR&6,FLGMSG&5   MOVE FLAG OF ALTER TRK 12  09393  D 09831 09681 1
2076           MLNA   LHADDR&12,FLGMSG&16 MOVE ADDR OF ALTR TRK 12  09405  D 09837 09692 /
2077           B      PRTFM                                     7  09417  J 09669
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PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
2078	HAFERR	SBR	GOBACK&5	SAVE RETURN ADDR	7	09424	G 09730 B
2079		SBR	X8		7	09431	G 00064 B
2080		S	@20@,X8	ADJUST ADDR STORED	11	09438	S 09820 00064
2081		MLNB	0&X8,X8	STORE ADDR OF ADDR IN ALTR LOG	12	09449	D 00'.00 00064 J
2082		MLNS	1&X8,FLGMSG&5	MOVE FLAG OF ALTER TRK	12	09461	D 00'.01 09681 1
2083		MLCA	0&X8,FLGMSG&16	MOVE ADDR OF ALTR TRK	12	09473	D 00'.00 09692 T
2084		MLNS	TSTADD&13,FLGMSG&37	MOVE FLAG OF DATA TRK	12	09485	D 09883 09713 1
2085		MLNA	TSTADD&12,FLGMSG&29	MOVE ADDR OF DATA TRK	12	09497	D 09882 09705 /
2086		MLCS	@3@,FLGMSG&44	MOVE ERROR TYPE CODE	12	09509	D 09744 09720 3
2087		B	PRTFM		7	09521	J 09669
2088	ILLFLG	SBR	GOBACK&5	STORE ADDR FOR RETURN	7	09528	G 09730 B
2089		MLNS	@ @,FLGMSG&5	RESET FLAG POS	12	09535	D 09737 09681 1
2090		MLCA	@ @,FLGMSG&16	RESET HA1 ADDR POS	12	09547	D 09824 09692 T
2091		MLNS	TSTADD&13,FLGMSG&37	MOVE FLAG OF DATA TRK	12	09559	D 09883 09713 1
2092		MLNA	TSTADD&12,FLGMSG&29	MOVE ADDR OF DATA TRK	12	09571	D 09882 09705 /
2093		MLCS	@4@,FLGMSG&44	MOVE ERROR TYPE CODE	12	09583	D 09810 09720 3
2094		B	PRTFM		7	09595	J 09669
2095	HAAERR	SBR	GOBACK&5	SAVE RETURN ADDR	7	09602	G 09730 B
2096		MLNS	@ @,FLGMSG&37	RESET DATA TRK FLAG	12	09609	D 09737 09713 1
2097		MLNA	@ @,FLGMSG&29	RESET DATA TRK ADDR	12	09621	D 09824 09705 /
2098		MLNS	1&X10,FLGMSG&5	MOVE FLAG OF ALTER	12	09633	D 00''.1 09681 1
2099		MLCA	0&X10,FLGMSG&16	MOVE ADDR OF ALTR TRK	12	09645	D 00''.0 09692 T
2100		MLCS	@1@,FLGMSG&44	MOVE ERROR TYPE CODE	12	09657	D 09738 09720 3
2101	PRTFM	B	TYP1		7	09669	J 01593
2102	FLGMSG	DCW	@	@,G	48	09676	
2103	GOBACK	B	0		7	09725	J 00000
2104		H			1	09732	.

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
2106		LTORG			09733	
2106			@N@	1	09733	
2106			@≠@	1	09734	
2106			@L@ D	1	09735	
2106			@M@ G	1	09736	
2106			@ @	1	09737	
2106			@1@	1	09738	
2106			@00209@	5	09743	
2106			@3@	1	09744	
2106			@7@	1	09745	
2106			@00237@	5	09750	
2106			@2@	1	09751	
2106			@00@	2	09753	
2106			@0001@	4	09757	
2106			@0000@	4	09761	
2106			@1308@	4	09765	
2106			@57@	2	09767	
2106			N00	5	09772	04743
2106			@9#20@	4	09776	
2106			@8@	1	09777	
2106			N01	5	09782	05584
2106			@00000@	5	09787	
2106			@* @	2	09789	
2106			@6@	1	09790	
2106			@** @	3	09793	
2106			@13@	2	09795	
2106			@XXXX@	4	09799	
2106			@40@	2	09801	
2106			@00008@	5	09806	
2106			@250@	3	09809	
2106			@4@	1	09810	
2106			@ @	2	09812	
2106			@00400@	5	09817	
2106			@5@	1	09818	
2106			@20@	2	09820	
2106			@ @	4	09824	
2107	LHADDR	DCW	@000000088@,G	8	09825	
2108		DCW	@00008@,G	5	09838	

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
2109	UHADDR	DCW	@000000088@,G	8	09840	
2110		DCW	@00008@,G	5	09853	
2111	VERADD	DCW	@000000088@,G	8	09855	
2112		DCW	@00008@,G	5	09868	
2113	TSTADD	DCW	@000000088@,G	8	09870	
2114		DCW	@00008@,G	5	09883	
2115	RDADDR	DCW	@000000088@,G	8	09885	
2116		DCW	@00008@,G	5	09898	
2117	CETRK	DCW	@009#2088@,G	8	09900	
2118		DCW	@00008@,G	5	09913	
2119	CETRKW	DCW	@009#2088@,G	8	09915	
2120		DCW	@9#208@,G	5	09928	
2121	ADDR1	DCW	POSACC	5	09934	05605
2122	ADDR2		RDALT	5	09939	06011
2123	ADDR3		RDDASF	5	09944	06449
2124	ADDR4		ALTLOG	5	09949	10047
2125	ADDR5		RDLOW	5	09954	07723
2126	ADDR6		RDHI	5	09959	07806
2127	ADDR7		VERADS	5	09964	07953
2128	INTADR	DCW	@000000088@,G	8	09965	
2129	INTFLD	DCW	@00008@,G	5	09974	
2130	ADDR9		FLGLOG	5	09984	10097
2131	ADDR10		EQHI&7	5	09989	06113
2132	ADDR11		LOFLGE&7	5	09994	06569
2133	ADDR12		WRTLAD	5	09999	07565
2134	ADDR13		WRTHI	5	10004	07638
2135	ADDR14		W	5	10009	04824
2136	ADDR15		X	5	10014	04932
2137	ADDR16		Y	5	10019	05012
2138	TENCNT		@0@	1	10020	
2139	CODE3	DCW	@%R1@	3	10023	
2140			@¤X2@	3	10026	
2141			@M33@	3	10029	
2142		DCW	@.14@	3	10032	
2143	FLGTRK	DCW	@124567@	6	10033	
2144	TSTSW1	DC	@ @	1	10039	
2145	SURFO	DC	@ @	1	10040	

PROGRAM CONSTANTS

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
2146	CYLCNT	DCW	@00008@	5	10045	
2147	ALADSW	DC	@ @	1	10046	
2148	ALTLOG	DCW	@XXXXX @	6	10047	
2149		DCW	@XXXXX @	6	10058	
2150		DCW	@XXXXX @	6	10064	
2151		DCW	@XXXXX @	6	10070	
2152		DCW	@XXXXX @	6	10076	
2153		DCW	@XXXXX @	6	10082	
2154	TRKCNT	DCW	@00@	2	10084	
2155	TSTSW2	DC	@ @	1	10085	
2156	SAVLOW	DCW	@ @	5	10090	
2157	SAVHI	DCW	@ @	5	10095	
2158	TSTSW3	DC	@ @	1	10096	
2159	FLGLOG	DC	@*@	1	10097	
2160		LOAD				
2161		END	2000			J02000

END OF ASSEMBLY