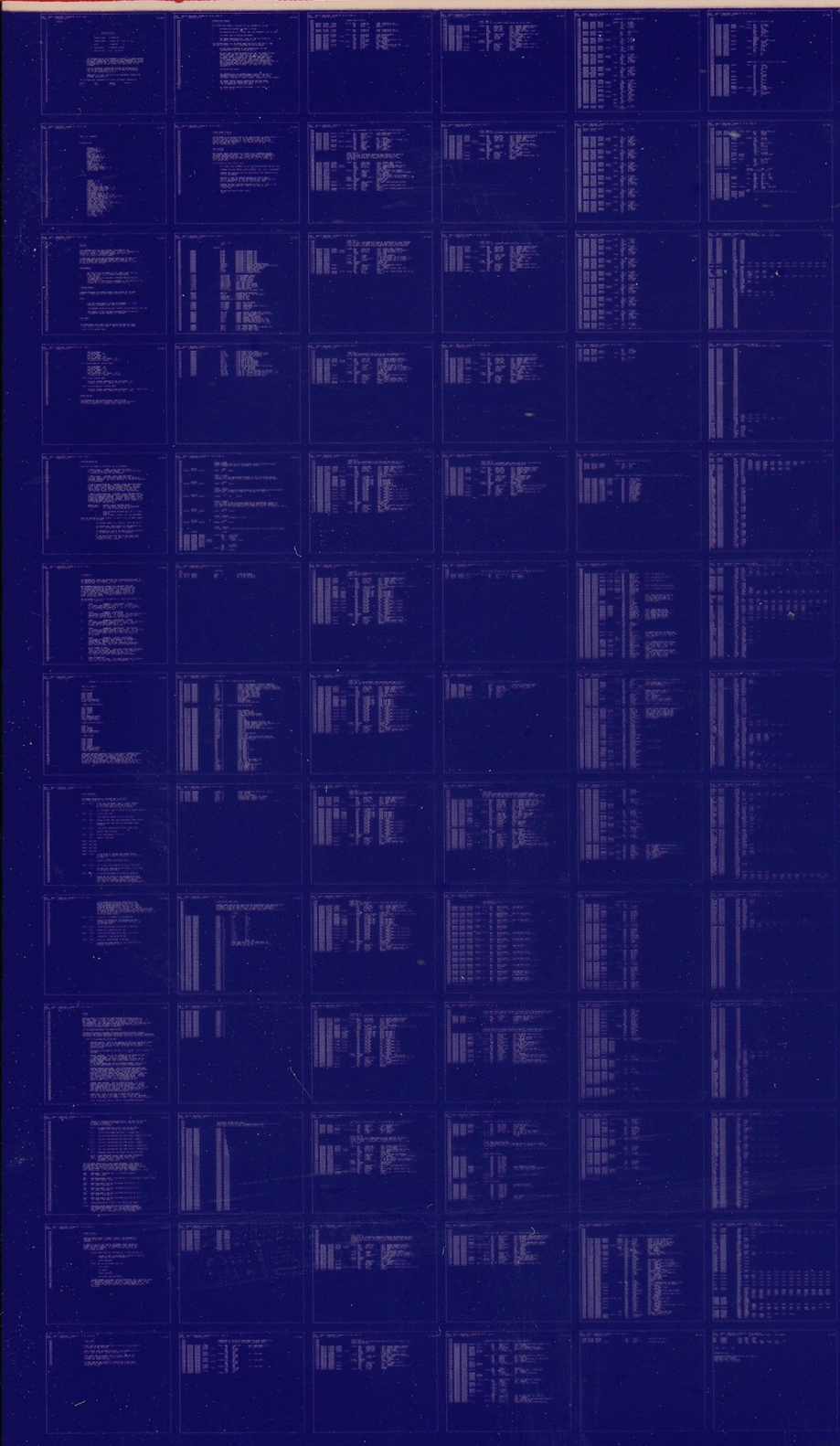
# CB11

LOGIC TEST
CZCBAC0

AH-8395C-MC

FICHE 1 OF 1

JUL 1978
digital
MADE IN USA



```
000000                          .REPT 0
```

## IDENTIFICATION

PRODUCT CODE:  AC-8394C-MC

PRODUCT NAME:  CZCBAC0 CB11 LOGIC TEST

DATE:  15-MAR-78

MAINTAINER:  DIAGNOSTIC GROUP

MODIFIED BY:  BILL SCHLITZKUS

```
52
53
54
55                              TABLE  OF  CONTENTS
56                              ------------------
57
58
59                              DOCUMENTATION
60
61
62                                      ABSTRACT --- 3
63                                      REQUIREMENTS --- 3
64                                      LOADING-STORAGE --- 3
65                                      NOTES --- 3
66                                      RUN TIMES --- 3
67                                      POWER FAILURE --- 3
68                                      STARTING-OPERATION --- 4
69                                      TTY QUERIES --- 5
70                                      SWITCH REGISTER --- 6
71                                      ERRORS --- 7
72                                      ERROR OPTIONS --- 8
73                                      SCOPE LOOP --- 9
74                                      INTERMITTANT ERRORS --- 10
75                                      FORCED ERROR TYPEOUT --- 11
76                                      TRAP CATCHER --- 11
77
78
79                              LISTING
80
81
82                                      EQUATES --- 12
83                                      STARTS --- 13
84                                      CONSTANTS --- 14
85                                      VARIABLES --- 15
86                                      SCAN CONTROL WORD TABLE --- 16
87                                      DIST. CONTROL WORD TABLE --- 17
88                                      MAINT. MODE SIMULATION --- 18
89                                      TIME DELAYS --- 19
90                                      SCAN BOARD TESTS --- 20
91                                      DISTRIBUTE BOARD TESTS --- 30
92                                      DISTRIBUTE JUMPERED TO SCAN (DJS) TESTS --- 37
93                                      ACCEPT/EXERCISE CONTROL --- 40
94                                      SCOPE TRAP SERVICE --- 41
95                                      CONTROL TRAP SERVICE --- 41
96                                      TRACE TRAP & POWER FAIL TRAP SERVICE --- 42
97                                      ERROR TRAP SERVICE --- 43
98                                      INTERMITTANT CONTROL --- 44
99                                      ERROR MESSAGE CONTROL --- 45
100                                     INITIALIZATION --- 48
101                                     TTY QUERY CONTROL --- 49
102                                     TTY INPUT --- 50
103                                     TTY OUTPUT --- 51
104                                     PASS CONTROL --- 52
105
```

```
106
107
108                             ABSTRACT
109                             --------
110
111                             THIS PROGRAM TESTS THE CB11 SYSTEM.  SCAN MODULES ARE
112                             EXPLICITLY TESTED VIA MAINTENANCE MODE, (WHICH IS THEREFORE ALSO
113                             EXPLICITLY TESTED.)  DISTRIBUTE MODULES ARE EXPLICITLY
114                             TESTED IN A DIRECT READ/WRITE MANNER.
115
116                             IN ADDITION, BOTH SCAN AND DISTRIBUTE BOARDS MAY BE IMPLICITY
117                             TESTED WHENEVER TWO DISTRIBUTE BOARDS ARE JUMPED IN SUCH A
118                             WAY AS TO DRIVE ONE SCAN BOARD AND WHEN THE PROGRAM IS CALLED
119                             TO RUN THIS TYPE OF TESTING.
120
121
122                             REQUIREMENTS
123                             ------------
124
125                             1.      ANY PDP-11 WITH 4K MEMORY, A TTY, AND A LINE CLOCK OR A
126                                     REAL TIME CLOCK, ALL IN PROPER WORKING ORDER.
127                             2.      A CB11 DEVICE.
128                             3.      THE USER INPUTS TO SCAN AND DISTRIBUTE MODULES MUST BE
129                                     DISCONNECTED.***
130                                     ***IF ITEM 3 IS NOT STRICTLY ADHERED TO, THE RESULTS TO THE
131                                     PROGRAM OR TO THE HARDWARE IS UNSPECIFIED.***
132
133
134                             LOADING-STORAGE
135                             ---------------
136
137                             LOADING PROCEDURE FOR NORMAL BINARY TAPES SHOULD BE FOLLOWED.
138                             MEMORY IS STORED AND UTILIZED FROM LOCATIONS 0 THRU 17776.
139
140
141                             NOTES
142                             -----
143
144                             1.      WITH THE EXCEPTION OF LISTING PAGE NUMBERS, ALL OTHER
145                                     NUMERICAL REFERENCES ARE STRICLY IN OCTAL.
146
147                             2.      THE PROGRAM CAN BE HALTED AND  STARTED, OR RESTARTED AT ANY TIME.
148
149                             3.      USER INPUTS TO THE SCAN AND DISTRIBUTE MODULES MUST BE
150                                     DISCONNECTED BEFORE RUNNING THIS PROGRAM.
151
152
153                             RUN TIMES
154                             ---------
155
156
157                             THE APPROXIMATE RUN TIMES GIVEN BELOW ARE FOR ONE PASS (BELL
158                             TO BELL) WITH ALL SWITCHES DOWN.  TIMES GIVEN ARE IN SECONDS.
159
160                             S & OR D DIAG (SA0200) MODE:
161
```

```
                        ONE SCAN BOARD   2
                        N SCAN BOARDS   N(2)
                        ONE DIST. BOARD   2
                        M DIST. BOARDS   M(2)
                        ONE SCAN & ONE DIST. BOARD   2+2
                        N SCAN & M DIST. BOARDS   N(2)+M(2)

                S & D ACCEPT/EXERCISE (SA1010) MODE:

                        ONE SCAN BOARD   10
                        N SCAN BOARDS   N(10)
                        ONE DIST. BOARD   17
                        M DIST. BOARDS   M(17)
                        ONE SCAN & ONE DIST. BOARD   10+17
                        N SCAN & M DIST. BOARDS   N(10)+M(17)

                D JMPR S DIAG (SA1000) MODE:

                        TWO DIST. BOARDS JUMPERED TO ONE SCAN BOARD   55
                        N GROUPS OF TWO DIST. JUMPED TO ONE SCAN   N(55)

                D JMPR S ACCEPT/EXERCISE (SA1020) MODE:

                        TWO DIST. BOARDS JUMPERED TO ONE SCAN BOARD   225   (3MIN 45SECS)
                        N GROUPS OF TWO DIST. JUMPED TO ONE SCAN   N(225)


                POWER FAILURE
                -------------

                THIS PROGRAM MAY NOT RECOVER FROM A POWER FAILURE.
                THEREFORE,THIS DIAGNOSTIC SHOULD NOT BE USED WHEN VERIFYING
                THE SYSTEM CAPABILITY TO RECOVER FROM A POWER FAILURE.
```

```
                        STARTING-OPERATION
                        ------------------

                        THERE ARE FIVE MODES OF OPERATION IN THIS PROGRAM:

                        1.      S &/OR D DIAG.   (SA200 - W/ALL SWITCHES RESET.)
                                TEST SCAN AND/OR DISTRIBUTE BOARDS.  THE SWITCH REGISTER
                                IS CONTROLLED ENTIRELY BY THE OPERATOR.

                        2.      D JMPR S DIAG.   (SA1000 - W/ALL SWITCHES RESET.)
                                TEST ONE SCAN & TWO DISTRIBUTE BOARDS THAT ARE SPECIALLY
                                JUMPERED TOGETHER.  THE SWITCH REGISTER IS CONTROLLED ENTIRELY
                                BY THE OPERATOR.

                        3.      S &/OR D ACCEPT/EXERCISE   (SA1010 - W/ALL SWITCHES RESET.)
                                ACCEPT/EXERCISE SCAN AND/OR DISTRIBUTE BOARDS.  SWITCHES
                                SWR12, SWR11, SWR2 & SWR1 ARE CONTROLLED BY THE PROGRAM.
                                TWELVE PASSES OF THE PROGRAM ARE MADE, EACH WITH THE
                                FOUR SWITCHES (ABOVE) SET TO A DIFFERENT CONFIGURATION.

                        4.      D JMPR S ACCEPT/EXERCISE   (SA1020 - W/ALL SWITCHES RESET.)
                                ACCEPT/EXERCISE ONE SCAN AND TWO DISTRIBUTE BOARDS THAT ARE
                                SPECIALLY JUMPERED TOGETHER.  SWITCHES SWR12, SWR11, SWR2
                                & SWR1 ARE CONTROLLED BY THE PROGRAM.  TWELVE PASSES OF THE
                                PROGRAM ARE MADE, EACH WITH THE FOUR SWITCHES (ABOVE) SET
                                TO A DIFFERENT CONFIGURATION.

                        5.      MODULE TEST.   (SA1030 - W/ALL SWITCHES RESET.)
                                REQUIREMENTS:   ONLY ONE MODULE CAN BE ON THE BACKBOARD
                                                AT A TIME (EITHER SCAN OR DIST.)

                                TESTS:
                                        A.      THAT THE BOARD RESPONDS ONLY TO ITS GIVEN
                                                ADDRESS.
                                        B.      SAME AS MODE 1 (ABOVE) FOR THIS ONE BOARD.

                        WHEN THE PROGRAM HAS BEEN STARTED, (IN ANY OF THE FIVE MODES ABOVE)
                        THE ACTION IS AS FOLLOWS:

                                1.      THE PROGRAM (MODE) WILL IDENTIFY ITSELF ON THE TTY.

                                2.      THE PROGRAM WILL MAKE QUERIES OF THE OPERATOR VIA
                                        THE TTY.  (OPTION AVAILABLE - SEE SWR03)

                                3.      THE PROGRAM WILL RUN IN THE MODE SELECTED ACCORDING
                                        TO THE REPLIES GIVEN TO THE TTY QUERIES.

                                4.      AT THE END OF EACH PASS THE TTY BELL WILL RING
                                        (OPTION AVAILABLE - SEE SWR05) AND ANOTHER PASS
                                        IS BEGUN (AT STEP 3 ABOVE).
```

```
                                TTY QUERIES
                                -----------

                THE PROGRAM WILL QUERY THE OPERATOR FOR INFORMATION NECESSARY TO
                THE OPERATION OF THE PROGRAM.  THE ONLY LEGAL CHARACTERS FOR ANY OF
                THE QUERIES ARE:  0 1 2 3 4 5 6 7 Y N

                ANY ERRONEOUS REPLIES WILL RESULT IN A RE-QUERY FOR THAT
                PARTICULAR INFORMATION OR IN SOME CASES OF ALL INFORMATION.
                THE PROGRAM CAN ALWAYS BE RESTARTED.  THE PROGRAM WILL NOT
                ALLOW ANY ERRORS IN ADDRESSES EXCEPT WHEN IT IS BEING TOLD
                IT HAS A SCAN (OR DIST.) BOARD AT AN ADDRESS WHICH IN FACT
                IS NOT PHYSICALLY THERE.  ALLOWABLE ADDRESSES ARE IN THE
                RANGE 164000 THRU 167776.

                THE FOLLOWING IS A LIST OF THE QUERIES (Q) AND DESCRIPTION OF THE
                REPLIES TO BE GIVEN (R).

                Q.      LOSA?           EXAMPLES:  LOSA?164000   LOSA?N
                R.      THE LOWEST SCAN ADDRESS TO BE TESTED.  THE LAST DIGIT
                        OF THIS ADDRESS MUST ALWAYS BE 0.  IF NO SCAN ADDRESSES
                        ARE TO BE TESTED, TYPE N (NO).

                Q.      HISA?           EXAMPLE:  HISA?164006
                R.      THE HIGHEST SCAN ADDRESS TO BE TESTED.  THE LAST DIGIT OF THIS
                        ADDRESS MUST ALWAYS BE 6.  IF THE REPLY TO LOSA (ABOVE)
                        WAS N (NO) THEN THIS QUERY WILL NOT BE MADE.

                Q.      LODA?           EXAMPLES:  LODA?164010   LODA?N
                R.      THE LOWEST DISTRIBUTE ADDRESS TO BE TESTED.  THE LAST DIGIT
                        OF THIS ADDRESS MUST ALWAYS BE 0.  IF NO DISTRIBUTE
                        ADDRESS ARE TO BE TESTED, TYPE N (NO).

                Q.      HIDA?           EXAMPLES:  HIDA?164012   HIDA?164016
                R.      THE HIGHEST DISTRIBUTE ADDRESS TO BE TESTED.  THE LAST DIGIT
                        OF THIS ADDRESS MUST ALWAYS BE EITHER 2 OR 6.  IF THE
                        REPLY TO LODA (ABOVE) WAS N (NO) THEN THIS QUERY WILL
                        NOT BE MADE.

                Q.      DATA?           EXAMPLES:  DATA?N   DATA?123456
                R.      THIS QUERY IS MADE ONLY WHEN RUNNING THE PROGRAM IN
                        DJMPRS MODES.  NORMALLY REPLY N (NO).  IF IT IS
                        DESIRED TO RUN THIS TEST ON ONE, OPERATOR CHOSEN DATA
                        WORD, AND NO OTHERS, THEN TYPE THE DATA WORD DESIRED.

                Q.      DISTS JUMPED TO SCAN?
                R.      REPLY Y (YES) OR N (NO).  THIS QUERY SERVES ONLY TO DOUBLE
                        CHECK THAT THE PROPER JUMPERS ARE IN.  THE PROGRAM WILL
                        NOT EVEN TRY TO CONTINUE UNTIL THE REPLY IS Y.
                        THIS QUERY IS ONLY MADE WHEN RUNNING DJMPRS MODES.

                Q.      USER DISCONNECTED?
                R.      REPLY Y (YES) OR N (NO).  THIS QUERY SERVES ONLY TO DOUBLE
                        CHECK THAT THE USER INPUTS ARE DISCONNECTED.  THE
```

```
                        PROGRAM WILL NOT EVEN TRY TO RUN UNTIL THE REPLY IS Y.


                        COMPLETE EXAMPLES:

                        S &/OR D DIAG

                        LOSA? 164000
                        HISA? 164006
                        LODA? 164010
                        HIDA? 164012
                        TEL CO DISCONNECTED? Y
                        THANKS! NOW TESTING

                        D JMPR S ACCEPT/EXERCISE

                        LOSA? 164000
                        HISA? 164006
                        LODA? 164010
                        HIDA? 164016
                        DATA? N
                        DIST JUMPED TO SCAN? Y
                        USER DISCONNECTED? Y
                        THANKS! NOW TESTING

                        S &/OR D ACCEPT/EXERCISE

                        LOSA? N
                        LODA? 164100
                        HIDA? 164206
                        USER DISCONNECTED? Y
                        THANKS! NOW TESTING

                        D JMPR S DIAG

                        LOSA? 164000
                        HISA? 164006
                        LODA? 164010
                        HIDA? 164016
                        DATA? 123456
                        DIST JUMPED TO SCAN? Y
                        USER DISCONNECTED? Y
                        THANKS! NOW TESTING

                        THERE ARE TOO MANY POSSIBILITIES TO GIVE USEFUL ERRONEOUS EXAMPLES.
                        THE MORE OBVIOUS ERRORS ONLY CAUSE A RE-QUERY.  LESS OBVIOUS
                        ERRORS WILL CAUSE A SHORT EXPLANATORY TYPEOUT AS TO WHY THE
                        REPLY IS NOT ACCEPTABLE.  THE PROGRAM WILL NOT RUN UNTIL
                        ALL REPLIES ARE SATISFACTORY.  THE PROGRAM HAS NO WAY OF TELLING
                        DURING THE QUERIES WHETHER OR NOT A BOARD ACTUALLY EXISTS AS
                        INDICATED.  ERRORS OF THIS TYPE WILL CAUSE AN ERROR IN THE TESTS.
```

```
                        SWITCH REGISTER
                        ---------------

                        FOR NORMAL OPERATION ALL SWITCHES ARE TO BE RESET.
                        RESET MEANS DOWN OR A "0", SET MEANS UP OR A "1".

                        SWR15   RESET   DO NOT HALT ON ERROR.  MAKE A SINGLE TYPEOUT
                                        OF EACH ERROR THAT OCCURS AND GO ON TO THE
                                        NEXT TEST OR LOOP OF A TEST IN SEQUENCE.

                                SET     HALT ON ERROR.  MAKE A TYPEOUT OF THE ERROR THEN HALT.

                        SWR14   RESET   DO NOT SCOPE LOOP.

                                SET     SCOPE LOOP ON CURRENT TEST OR TEST LOOP.

                        SWR13   RESET   DURING A SCOPE LOOP, MAKE SUBSEQUENT ERROR TYPEOUTS.

                                SET     DURING A SCOPE LOOP, MAKE NO SUBSEQUENT ERROR
                                        TYPEOUTS.

                        SWR12   RESET   ALLOW TRACE TRAPPING AFTER EVERY INSTRUCTION.

                                SET     INHIBIT TRACE TRAPPING.

                        SWR11   RESET   ALLOW ITERATIONS OF THE TESTS.

                                SET     INHIBIT ITERATIONS.

                        SWR10   NOT USED.

                        SWR09   NOT USED.

                        SWR08   NOT USED.

                        SWR07   NOT USED.

                        SWR06   RESET   IN THE EVENT OF INTERMITTANT ERRORS DURING
                                        A SCOPE LOOP, A COUNT OF ERRORS AND OF "OK'S" WILL
                                        BE TYPED.

                                SET     INHIBIT THE ABOVE DESCRIBED TYPOUT.


                        SWR05   RESET   THE TTY BELL WILL RING AT THE END OF EACH PASS.

                                SET     THE BELL WILL RING AND A PASS COUNT WILL BE TYPED
                                        AT THE END OF EACH PASS.

                        SWR04   RESET   THE OPTION DESCRIBED AS FOLLOWS IS INHIBITED.

                                SET     REPORT ON THE STATUS OF THE PROGRAM AFTER EACH
                                        SUB-TEST OR TEST LOOP.  THIS TYPEOUT WILL OCCUR
                                        EACH TIME THE PSUEDO-OP CONTROL IS EXECUTED.
                                        THE TYPEOUT IS THE SAME ONE USED FOR ERROR REPORTS.
```

```
                                        THE OCCURANCE OF AN ACTUAL ERROR WHILE THIS
                                        OPTION IS BEING UTILIZED WILL NOT AFFECT THE
                                        ERROR REPORTING MECHINISM, NOR WILL THE ERROR
                                        REPORTING MECHANISM EFFECT THIS OPTION.  SWITCH
                                        SWR00 IS APPLICABLE TO THIS TYPEOUT.  THE OBVIOUS DETECTABLE
                                        DIFFERENCE BETWEEN THIS TYPEOUT AND AN ACTUAL ERROR TYPEOUT
                                        IS THAT BIT 0 OF FLAGS (SEE ERROR SECTION) WILL BE SET ONLY FOR
                                        AN ACTUAL ERROR TYPEOUT.

                    SWR03   RESET       ALLOW FULL TTY QUERIES OF THE OPERATOR.

                            SET         INHIBIT TTY QUERIES OF THE OPERATOR AND USE
                                        THE REPLIES GIVEN BY THE OPERATOR THE LAST TIME
                                        QUERIES WERE MADE.

                    SWR02   RESET       THE OPTION DESCRIBED AS FOLLOWS IN INHIBITED.

                            SET         SHORTEN ALL TIME DELAYS BY 10%.

                    SWR01   RESET       THE OPTION DESCRIBED AS FOLLOWS IS INHIBITED.

                            SET         LENGTHEN ALL TIME DELAYS BY 10%.

                    SWR00   RESET       ALLOW FULL ERROR REPORT TO BE MADE.

                            SET         SHORTEN THE ERROR REPORT TO THE CONTENTS OF THE
                                        PROGRAM COUNTER ONLY (PC/),
```

```
436
437                                 ERRORS
438                                 ------
439
440                                 WHEN AN ERROR IS DETECTED THE ERROR MESSAGE DESCRIBED BELOW WILL
441                                 BE TYPED.  THEN, IF SWR15 IS RESET, TESTING WILL RESUME WITH THE
442                                 NEXT ITERATION, TEST LOOP, OR TEST IN SEQUENCE.  IF SWR15 IS SET
443                                 THE PROGRAM WILL HALT AND AWAIT OPERATOR INTERVENTION. (SEE ERROR OPTIONS.)
444                                 THE DECISION TO HALT ON ERROR CAN BE MADE AND SWR15 CAN BE SET AT ANY
445                                 TIME BEFORE THE ERROR TYPEOUT IS COMPLETED.
446
447                                 THE FOLLOWING REPRESENTS THE ERROR MESSAGE:
448
449                                 PC/XXXXXX PS/XXXXXX CA/XXXXXX CX/XXXXXX CW/XXXXXX BT/XXXX F/XXXXXX
450                                 GWD/XXXXXX GMF/XXXXXX GW0/XXXXXX GW2/XXXXXX GW4/XXXXXX GW6/XXXXXX SWR/XXXXXX
451                                 TWD/XXXXXX TMF/XXXXXX TW0/XXXXXX TW2/XXXXXX TW4/XXXXXX TW6/XXXXXX AXSWR/XXXXXX
452
453                                 - - AND IT IS INTERPRETED AS FOLLOWS:
454
455                                 PC/     PROGRAM COUNTER.  THIS IS THE ADDRESS OF THE CALL (PSUEDO-OP ERROR)
456                                         THAT CAUSED THE TRAP TO THE ERROR HANDLING ROUTINE AND WILL,
457                                         INDICATE IN THE PROGRAM LISTING, THE ERROR THAT OCCURRED.  THIS IS
458                                         ALWAYS RELEVANT.
459
460                                 PS/     PROCESSOR STATUS WORD AT THE TIME OF THE ERROR.  THIS IS ALWAYS
461                                         RELEVANT.
462
463                                 CA/     CONTROL ADDRESS.  THIS IS THE ADDRESS OF THE BOARD IN ERROR. IT
464                                         IS ALWAYS RELEVANT.  THIS IS THE CONTENTS OF R2.
465                                         IF THE BOARD UNDER TEST WAS A SCAN BOARD, THIS WILL BE THE
466                                         CONTROL ADDRESS (MAINT. MODE CONTROL-WORD 0 ADRS.) OF THE
467                                         BOARD IN ERROR.
468                                         IF THE BOARD UNDER TEST WAS A DISTRIBUTE BOARD, THIS WILL BE
469                                         THE ACTUAL WORD ADDRESS OF THE FAILING DISTRIBUTE WORD.
470
471                                 CX/     CONTROL ADDRESS AUXILIARY.  THIS IS RELEVANT ONLY WHEN BOTH
472                                         SCAN AND DISTRIBUTE BOARDS ARE BEING TESTED TOGETHER (DJMPRS).
473                                         AT ALL OTHER TIMES THIS WILL BE:  CX/NR (NOT RELEVANT).
474                                         WHEN BOTH TYPES OF BOARDS ARE BEING TESTED TOGETHER, THIS WILL
475                                         CONTAIN THE ADDRESS OF THE SCAN BOARD AND THE CA/  (ABOVE)
476                                         WILL CONTAIN THE ADDRESS OF THE DISTRIBUTE BOARD.  IN SHORT,
477                                         THE DIST. BOARD AT ADRS. (CA/) WAS DRIVING THE SCAN
478                                         BOARD AT ADRS. (CX/).  THIS IS THE CONTENTS OF R3.
479
480                                 CW/     CONTROL WORD POINTER.  THIS IS ALWAYS RELEVANT.  IT IS THE
481                                         ADDRESS OF THE SCAN CONTROL WORD OR THE DISTRIBUTE CONTROL
482                                         WORD, DEPENDING ON THE TYPE OF BOARD UNDER TEST.  THE WORD
483                                         THIS ADDRESS POINTS AT (FOR THIS IS THE CONTENTS OF R4) IS THE
484                                         WORD USED TO SET SET/CLEAR MAINT. FLOPS IN SCAN BOARDS OR
485                                         SET/CLEAR THE DISTRIBUTE BOARD WORD DIRECTLY.
486
487                                 BT/     BOARD TYPE.  THIS IS THE TYPE OF BOARD THAT WAS UNDER
488                                         TEST AT THE TIME OF THE ERROR.  IT WILL ALWAYS BE:  BT/SCAN;
489                                         BT/DIST; OR BT/DJS (DIST JMPRD TO SCAN).  THIS IS ALWAYS RELEVANT.
490
491                                 F/      FLAGS. THESE ARE FLAG BITS USED BY THE PROGRAM FOR VARIOUS
```

```
                        PURPOSES OF MAINTAINING PROGRAM STATUS.  BECAUSE THEY MAY
                        BE USEFUL IN GENERAL, THEY ARE TYPED OUT AND THEY MAY BE
                        INTERPRETED AS FOLLOWS:

                        BIT 0    AN ERROR CONDITION EXISTS THAT HAS NOT BEEN
                                 CLEARED (BY A RESTART OR A BYPASS ERROR)

                        BIT 1    THE EXISTING ERROR CONDITION IS INTERMITTANT.

                        BIT 2    THE LAST START/RESTART WAS FROM SA1030. (MODULE TEST MODE)

                        BIT 3    THE LAST START/RESTART WAS FROM SA200. (S&ORD)

                        BIT 4    THE LAST START/RESTART WAS FROM SA1000. (DJMPRS)

                        BIT 5    THE LAST START/RESTART WAS FROM SA1010. (S&ORD/AC/EX)

                        BIT 6    THE LAST START/RESTART WAS FROM SA1020. (DJMPRS/AC/EX)

                        BIT 7    OPERATOR GIVEN DATA WAS BEING USED ON A DJS PASS.

                        BIT 8    ERROR RELEVANCY FLAGS. (HOW THE PROG. DETERMINES
                        THRU     WHAT IS AND IS NOT RELEVANT TO BE TYPED IN
                        BIT 15   AN ERROR TYPEOUT.  THESE ARE SET AT THE
                                 BEGINNING OF EACH TEST.)

                THE FOLLOWING ERROR DATA IS NOT ALWAYS RELEVANT.  THAT WHICH IS
                NOT RELEVANT WILL BE GIVEN AS NR (NOT RELEVANT).  THAT WHICH IS
                RELEVANT WILL BE GIVEN A SIX DIGIT OCTAL VALUE.  IN THE DEFINITIONS
                GIVEN BELOW "GOOD" IS WHAT SHOULD HAVE BEEN AND "TEST" IS
                WHAT ACTUALLY WAS.  IF "TEST" DIFFERS FROM "GOOD", THEN "TEST" IS BAD.

                GWD/     GOOD WORD. - RELEVANT ONLY TO DISTRIBUTE BOARDS.
                TWD/     TEST (BAD?) WORD.

                GMF/     GOOD MAINTENANCE FLOPS. - RELEVANT ONLY TO SCAN BOARDS IN MAINT. MODE.
                TMF/     TEST (BAD?) MAINT. FLOPS.

                GW0/     GOOD SCAN WORD 0 (OF THE SCAN BOARD INDICATED BY CA/).
                TW0/     TEST (BAD?) SCAN WORD 0.

                GW2/     GOOD SCAN WORD 2 (OF THE SCAN BOARD INDICATED BY CA/).
                TW2/     TEST (BAD?) SCAN WORD 2.

                GW4/     GOOD SCAN WORD 4 (OF THE SCAN BOARD INDICATED BY CA/).
                TW4/     TEST (BAD?) SCAN WORD 4.

                GW6/     GOOD SCAN WORD 6 (OF THE SCAN BOARD INDICATED BY CA/).
                TW6/     TEST (BAD?) SCAN WORD 6.

                SWR/     SWITCH REGISTER AS IT WAS AT THE TIME OF THE ERROR.

                AXSWR/   SIMULATED SWITCH REGISTER FOR ACCEPT/EXERCISE MODES.
                         THE PROGRAM WAS RUNNING AS IF THE SWITCHES REPRESENTED
                         HERE WERE ACTUALLY SET.  SEE STARTING-OPERATION, MODES
                         3 AND 4.  (NR IS TYPED WHEN THIS IS NOT RELEVANT.)
```

```
548
549                             ERROR OPTIONS
550                             -------------
551
552                             WHEN AN ERROR OCCURS, IF SWR15 IS RESET, THE PROGRAM WILL
553                             CONTINUE TO THE NEXT ITERATION, SUB-TEST LOOP OR TEST IN
554                             SEQUENCE.
555
556                             IF SWR15 IS SET AT THE TIME OF THE ERROR (SWR15 CAN BE SET
557                             DURING THE ERROR TYPEOUT) THE PROGRAM WILL HALT AFTER THE
558                             ERROR TYPEOUT IS COMPLETE, AT WHICH TIME THE OPERATOR HAS
559                             THE FOLLOWING OPTIONS.
560
561                             1.      DO NOT SCOPE LOOP, BUT CONTINUE AS IF SWR15 WAS NOT SET
562
563                                     A.      DECIDE IF HALT IS DESIRED ON OCCURANCE OF ANOTHER
564                                             ERROR AND SET SWR15 ACCORDINGLY.
565
566                                     B.      PRESS CONTINUE.
567
568                             2.      SCOPE LOOP ON THIS ERROR CONDITION.
569
570                                     A.      RESET SWR15.
571
572                                     B.      SET SWR14.
573
574                                     C.      PRESS CONTINUE.
575
576                                     D.      SEE SCOPE LOOPS SECTION
577
578                             3.      EXAMINE MEMORY LOCATIONS, SPECIAL REGISTERS, ETC., WHICH IS USUALLY
579                             NOT NECESSARY BECAUSE OF THE DETAIL GIVEN IN THE ERROR TYPEOUT.
580                             IF HOWEVER THE OPERATOR CHOOSES TO EXAMINE MEMORY ET. AL. THEN
581                             ALL OTHER OPTIONS ARE INVALIDATED AND A PROGRAM RESTART IS
582                             NECESSARY.
583
```

```
                                SCOPE LOOPS
                                -----------

                                SCOPE LOOP ON AN ERROR CONDITION IS EFFECTED AS DESCRIBED IN
                                THE ERROR OPTIONS SECTION.

                                ONCE A SCOPE LOOP HAS BEEN EFFECTED IT WILL REMAIN IN EFFECT
                                FOR AS LONG AS SWR15 IS RESET AND SWR14 IS SET.

                                THIS SCOPE LOOP IS LOCKED, THAT IS IT WILL LOOP ON THE
                                FAILING TEST EVEN THOUGH IT IS NO LONGER FAILING.  SEE
                                INTERMITTANT ERRORS SECTION.

                                A SCOPE LOOP ON ANY GIVEN TEST CONSISTS OF A LOOP FROM
                                THE PSUEDO-OP "ERROR" BACK TO THE LOCATION FOLLOWING THE
                                PSUEDO-OP "SCOPE".
```

```
                        INTERMITTENT ERRORS
                        -------------------

AN INTERMITTENT ERROR IS DEFINED FOR THIS PROGRAM AS FOLLOWS:

1.      AN ERROR HAS OCCURRED AND MADE A TYPEOUT.

2.      THE OPERATOR HAS SET A SCOPE LOOP (THE PROGRAM'S, NOT HIS OWN)

3.      THE SCOPE LOOP IS LOOPING ON ERRORS.

4.      THE ERROR CONDITION FAILS, THAT IS, THE TEST PASSED OK,
        AND WANTS TO CONTINUE TO THE NEXT TEST.

THE PROGRAM KNOWS THAT AN ERROR CONDITION EXISTS AND THAT A SCOPE
LOOP WAS IN EFFECT.  IT WILL THEREFORE DO THE FOLLOWING:

1.      ON THE FIRST OCCURANCE OF THE INTERMITTENT THE WORD
        "INTERMITTENT" WILL BE TYPED ON THE TTY.

2.      ON EACH LOOP, EITHER AN ERROR OR AN "OK" THE COUNTS OF BOTH
        ERROR LOOPS AND "OK" LOOPS WILL BE TYPED.  THE VALUE
        OF THESE COUNTS IS TO GIVE THE OPERATOR SOME IDEA OF THE
        FREQUENCY OF THE INTERMITTENT, THAT IS, HOW MANY TIMES
        IS THE ERROR CONDITION LOST?  THESE COUNTS ARE IN EFFECT
        ONLY IN A SCOPE LOOP THAT HAS DETECTED AN INTERMITTENT AND THEY
        BEGIN COUNTING WHEN THE INTERMITTENT IS FIRST DETECTED.
        THE COUNTERS ARE WRAP AROUND.  THE FORMAT OF THESE COUNT
        TYPEOUTS IS:

        ERC/XXXXXX OKC/XXXXXX


        THE OPERATOR WILL BE UNCONDITIONALLY NOTIFIED ON THE TTY
        WHENEVER EITHER OF THESE COUNTERS OVERFLOW.  THE COUNT
        CONTINUES, STARTING AT COUNT 0 AGAIN.  NOTHING ELSE HAS CHANGED.

3.      THE ABOVE TYPEOUT CAN BE INHIBITED BY SETTING SWR06.
        THE COUNT GOES ON HOWEVER AND CAN BE OBTAINED AT ANY
        TIME BY MOMENTARILY RESETTING SWR06.

4.      ALL OTHER SWITCH CONTROLS FOR ERRORS, SCOPE LOOPS, ETC.
        ARE STILL VALID.
```

```
643
644                             FORCED ERROR TYPEOUT
645                             --------------------
646
647                             IN THE EVENT OF AN ILLEGAL TRAP TO THE TRAP CATCHER, AN ERROR TYPEOUT
648                             THAT WILL REFLECT THE STATUS OF THE PROGRAM AT THE TIME OF THE
649                             ILLEGAL TRAP CAN BE OBTAINED BY STARTING THE PROGRAM AT SA1040.
650                             SWITCH SETTINGS ARE IMMATERIAL.  THE TYPEOUT WILL BE MADE, IN FULL,
651                             AND THE PROGRAM WILL HALT.
652
653
654                             TRAP CATCHER
655                             ------------
656
657                             ANY ILLEGAL TRAPS THAT OCCUR WILL CAUSE A HALT SOMEWHERE BETWEEN
658                             LOCATIONS 000000 AND 000776.  THE INITIALIZATION OF THE PROGRAM SET
659                             UP THESE LOCATIONS SUCH THAT ALL ILLEGAL TRAP VECTORS ("NEW" PC)
660                             POINT TO THE NEXT LOCATION ("NEW" PS) WHICH IS SET TO 000000, OR A
661                             HALT INSTRUCTION.
662
663                             IN THE EVENT OF THIS TYPE OF HALT:
664
665                             1.      AN ILLEGAL TRAP OCCURRED TO THE LOCATION PRECEDING THE HALT LOC.
666
667                             2.      EXAMINE LOCATION 177706 (STACK POINTER - R6). THIS IS AN ADDRESS.
668
669                             3.      EXAMINE THE LOCATION THAT WAS SPECIFIED BY THE CONTENTS OF R6.
670                                     THIS IS AN ADDRESS.
671
672                             4.      SUBTRACT 2 FROM THE ADDRESS OBTAINED BY STEP 3 ABOVE.
673                                     THIS IS THE ADDRESS OF THE INSTRUCTION THAT CAUSED, OR THAT
674                                     WAS IN PROGRESS AT THE TIME OF, THE ILLEGAL TRAP.
675
676                             5.      EXAMINE THE NEXT LOCATION (CONTENTS OF R6 + 2).  THIS IS THE
677                                     PROCESSOR STATUS WORD AS IT WAS AT THE TIME OF THE
678                                     ILLEGAL TRAP.
679
680                             6.      SEE SECTION FORCED ERROR TYPEOUT.
681                                     .ENDR
682
```

```
                                .TITLE  CB11
                                .ABS

                            ;EQUATES

000000                          R0=%0           ;REGISTER 0 GENERAL USE.
000001                          R1=%1           ;REGISTER 1 GENERAL USE.
000002                          R2=%2           ;REGISTER 2 SPECIAL USE.
000003                          R3=%3           ;REGISTER 3 SPECIAL USE.
000004                          R4=%4           ;REGISTER 4 SPECIAL USE.
000005                          R5=%5           ;REGISTER 5 SPECIAL USE.
000006                          R6=%6           ;REGISTER 6 SPECIAL USE.
000007                          R7=%7           ;REGISTER 7 SPECIAL USE.
000002                          CADR=R2         ;REGISTER 2 CONTROL ADDRESS POINTER.
000003                          CADRX=R3        ;REGISTER 3 AUXILIARY CONTROL ADDRESS POINTER.
000004                          CWP=R4          ;REGISTER 4 CONTROL WORD POINTER.
000005                          $=R5            ;REGISTER 5 SUBROUTINE POINTER.
000006                          STP=R6          ;REGISTER 6 STACK POINTER.
000007                          PC=R7           ;REGISTER 7 PROGRAM COUNTER.

177560                          TKS=177560      ;TTY KEY BOARD STATUS.
177562                          TKB=177562      ;TTY KEYBOARD BUFFER.
177564                          TPS=177564      ;TTY PRINTER STATUS.
177566                          TPB=177566      ;TTY PRINTER BUFFER.
177546                          KWLS=177546     ;LINE CLOCK STATUS.
172540                          KWPS=172540     ;REAL TIME CLOCK STATUS.
172542                          KWPB=172542     ;REAL TIME CLOCK BUFFER.
172544                          KWPC=172544     ;REAL TIME CLOCK COUNTER.
177776                          PS=177776       ;PROCESSOR STATUS
001143                          RFLGS=FLAGS+1   ;ERROR TYPEOUT RELEVANCY FLAGS..

000240                          NOP=240         ;PSUEDO-OP NO OPERATION.
000006                          RTT=6           ;RETURN FROM "T" TRAP INTERRUPT.
104400                          SCOPE=TRAP      ;PSUEDO-OP TRAP.
104000                          ERROR=EMT       ;PSUEDO-OP EMT.
104777                          CONTROL=104777  ;PSEUDO-OP TRAP.

100000                          HES=100000      ;SWR15  HALT ON ERROR.
040000                          SLS=40000       ;SWR14  SCOPE LOOP.
020000                          STS=20000       ;SWR13  SUBSEQUENT ERROR TYPEOUTS.
010000                          TTS=10000       ;SWR12  TRACE TRAP.
004000                          ITS=4000        ;SWR11  ITERATE.

000100                          IMS=100         ;SWR06  INHIBIT INTERMITTANT TYPEOUTS.
000040                          PCS=40          ;SWR05  TYPE PASS COUNT AT END OF PASSES.
000020                          TSS=20          ;SWR04  TYPE PROGRAM STATUS.
000010                          IQS=10          ;SWR03  INHIBIT TTY QUERIES.
000004                          SDS=4           ;SWR02  SHORTEN TIME DELAYS BY -10%
000002                          LDS=2           ;SWR01  LENGTHEN TIME DELAYS BY +10%
000001                          SES=1           ;SWR00  SHORT ERROR MESSAGES (PC ONLY).

000001                          ECF=1           ;FLAG  ERROR CONDITION.
000002                          IMF=2           ;FLAG   ERROR CONDITION IS INTERMITTANT.
000004                          MOD=4           ;FLAG  MODULE MODE START.
000010                          BF=10           ;FLAG S &OR D DIAG. START.
```

```
   739          000020                    JF=20          ;FLAG DJMPRS DIAG. START.
   740          000040                    BXF=40         ;FLAG S &OR D ACCEPT/EXERCISE START.
   741          000100                    JXF=100        ;FLAG DJMPRS ACCEPT/EXERCISE START.
   742          000200                    DATF=200       ;FLAG DATA IN USE ON DJMPRS/
   743          000001                    AXF=1          ;FLAG CAX RELEVANT.
   744          000002                    CWF=2          ;FLAG CWORD RELEVANT.
   745          000004                    WDF=4          ;FLAG GWD & TWD RELEVANT.
   746          000010                    MFF=10         ;FLAG GMF & TMF RELEVANT.
   747          000020                    WOF=20         ;FLAG GWO & TWO RELEVANT.
   748          000040                    W26F=40        ;FLAG GW2,GW4,GW6,TW2,TW4 & TW6 RELEVANT
   749          000100                    SF=100         ;FLAG "SCAN" RELEVANT.
   750          000200                    DF=200         ;FLAG "DIST" RELEVANT.
   751          000172                    SRF=172        ;FLAGS ALL THAT IS RELEVANT TO SCAN BDS.
   752          000206                    DRF=206        ;FLAGS ALL TYPEOUTS ARE RELEVANT TO DIST. BDS.
   753          000327                    DSRF=327       ;FLAGS ALL THAT IS RELEVANT TO DJS.
   754          000377                    ALRF=377       ;FLAGS ALL TYPEOUTS ARE RELEVANT.
   755
```

```
                                        ;START - SA200
                                        ;NORMAL PROGRAM START TO TEST SCAN BOARDS AND/OR DISTRIBUTE BOARDS
                                        ;WHILE DISCONNECTED FROM ALL TELEPHONE CO. INPUTS.

        000200                                  .=200
000200  000137  007462          S.ORD:  JMP     @#INIT

                                        ;START - SA1000
                                        ;SPECIAL START FOR SUB-PROGRAM "DJMPRS" TO TEST "DISTRIBUTE BOARDS
                                        ;JUMPERED TO SCAN BOARD" WHILE DISCONNECTED FROM ALL TELEPHONE INPUTS.

        001000                          .=1000
001000  000167  006476          DJMPRS: JMP     INITA

                                        ;START - SA1010
                                        ;SPECIAL START TO RUN ACCEPTANCE/EXERCISE OF SCAN BOARDS AND/OR DISTRIBUTE
                                        ;BOARDS WHILE DISCONNECTED FROM ALL TELEPHONE CO. INPUTS.

        001010                          .=1010
001010  000167  006504          S.ORDAX:        JMP     INITA2

                                        ;START - SA1020
                                        ;SPECIAL START TO RUN ACCEPTANCE/EXERCISE OF SUB-PROGRAM "DJMPRS" TO
                                        ;TEST TWO CONTIGUOUS DISTRIBUTE BOARDS WHOSE OUTPUTS ARE JUMPERED TO
                                        ;THE INPUTS OF ONE SCAN BOARD WHILE DISCONNECTED FROM ALL TELEPHONE CO. INPUTS.

        001020                          .=1020
001020  000167  006504          DJSAX:  JMP     INITA3

                                        ;START - SA1030
                                        ;SPECIAL START FOR MODULE TEST MODE.

        001030                          .=1030
001030  000167  006436          MODMOD: JMP     INITA5

                                        ;START - SA1040
                                        ;SPECIAL START TO FORCE AN ERROR TYPEOUT AFTER AN ILLEGAL TRAP HAS OCCURRED.

        001040                          .=1040

001040  010667  000226          FORCER: MOV     STP,FESAV
001044  012706  001000                  MOV     #1000,STP
001050  004567  011120                  JSR     $,TYPEA
001054  043136  051117  042503          .ASCII  " FORCED TYPEOUT."
001062  020104  054524  042520
001070  052517  027124
001074  004567  005114                  JSR     $,TYPERR
001100  016706  000166                  MOV     FESAV,STP
001104  000000          FORCEA: HALT
001106  000776                  BR      FORCEA
```

```
  812                                   ;CONSTANTS.
  813
  814  001110  000010                   ITNO:   10          ;ITERATION NUMBER.
  815  001112  000001                   DMS1:   1           ;NO. OF MS FOR DELAY.
  816  001114  000007                   DMS2:   7           ;NO. OF MS FOR DELAY.
```

```
                        ;VARIABLES - NOT CLEARED ON START OR RESTART.

001116  000000          LOSA:   0               ;LOWEST SCAN ADDRESS (GIVEN BY OPERATOR).
001120  000000          HISA:   0               ;HIGHEST SCAN ADDRESS (GIVEN BY OPERATOR).
001122  000000          LODA:   0               ;LOWEST DISTRIBUTE ADDRESS (GIVEN BY OPERATOR).
001124  000000          HIDA:   0               ;HIGHEST DISTRIBUTE ADDRESS (GIVEN BY OPERATOR).
001126  000000          LOSAX:  0               ;LO SCAN ADRS. AUXILIARY.
001130  000000          HISAX:  0               ;HI SCAN ADRS. AUXILIARY.
001132  000000          LODAX:  0               ;LO DIST. ADRS. AUXILIARY.
001134  000000          HIDAX:  0               ;HI DIST. ADRS. AUXILIARY.
001136  000000          SWR:    0               ;SWITCH REGISTER POINTER.
001140  000000          DATAWD: 0               ;DATA WORD.
001142  000000          FLAGS:  0               ;PROGRAM FLAGS.
001144  000000          FX:     0               ;PROGRAM FLAGS AUXILIARY.

                        ;VARIABLES - CLEARED ON START OR RESTART.

001146  000000          BEGV:   0
001150  000000          PASCTR: 0               ;PASS COUNTER   0
001152  000000          ITCNT:  0               ;ITERATION COUNTER.
001154  000000          SCORTN: 0               ;SCOPE LOOP RETURN POINTER.
001156  000000          IMCNT:  0               ;INTERMITTANT ERROR COUNTER.
001160  000000          SAVPC:  0               ;SAVED PC.
001162  000000          SAVPS:  0               ;SAVED PS.
001164  000000          SAVSWR: 0               ;SAVED SWR.
001166  000000          SAVCAD: 0               ;SAVED CONTROL ADDRESS POINTER. (R2)
001170  000000          SAVCAX: 0               ;SAVED CONTROL ADDRESS AUXILIARY POINTER. (R3)
001172  000000          SAVCWP: 0               ;SAVED CONTROL WORD POINTER. (R4)
001174  000000          SAVITC: 0               ;SAVED ITERATION COUNTER.
001176  000000          SAVOKC: 0               ;SAVED INTERMITTENT ERROR "OK" COUNTER.
001200  000000          SAVR0:  0               ;SAVED R0.
001202  000000          SAVR1:  0               ;SAVED R1.
001204  000000          SAVSTP: 0               ;SAVED STACK POINTER.
001206  000000          SAVFLG: 0               ;SAVED FLAGS.
001210  000000          AXSWR:  0               ;SWITCH REG. USED WITH ACCEPT/EXERCISE.
001212  000000          AXRTN:  0               ;RETURN POINTER USED WITH ACCEPT/EXERCISE
001214  000000          GMF:    0               ;GOOD MAINT. FLAGS.
001216  000000          GWD:    0               ;GOOD WORD.
001220  000000          GW0:    0               ;GOOD WORD 0
001222  000000          GW2:    0               ;GOOD WORD 2.
001224  000000          GW4:    0               ;GOOD WORD 4.
001226  000000          GW6:    0               ;GOOD WORD 6.
001230  000000          TMF:    0               ;TEST MAINT. FLOP
001232  000000          TWD:    0               ;TEST WORD
001234  000000          TW0:    0               ;TEST WORD 0.
001236  000000          TW2:    0               ;TEST WORD 2.
001240  000000          TW4:    0               ;TEST WORD 4.
001242  000000          TW6:    0               ;TEST WORD 6.
001244  000000          TLMT:   0               ;TIME LIMIT FOR SUBR. TIME.
001246  000000          TYPSRC: 0               ;ORIG. TYPE CALL SOURCE.
001250  000000          QSRC:   0               ;QUERY SOURCE
001252  000000          KCTR:   0               ;KEY IN CHARACTER COUNTER.
001254  000000          DLAN01: 0               ;DELAY NUMBER TYPE 1.
001256  000000          DLAN02: 0               ;DELAY NUMBER TYPE 2.
001260  000000          DLAOF1: 0               ;DELAY OFFSET TYPE 1.
001262  000000          DLAOF2: 0               ;DELAY OFFSET TYPE 2.
```

```
  873  001264  000000                SAVERC: 0       ;SAVED INTERMITTENT ERROR "ER" COUNTER.
  874  001266  000000                DLACTR: 0       ;DELAY COUNTER.
  875  001270  000000                KCSR:   0       ;CLOCK CSR (ACTUAL).
  876  001272  000000                FESAV:  0       ;FORCED ERROR TYPEOUT STP STORAGE.
  877  001274  000000                ERCTR:  0       ;INTERMITTENT COUNTER - ERRORS.
  878  001276  000000                OKCTR:  0       ;INTERMITTENT COUNTER - OK'S.
  879  001300  000000                ENDV:   0
```

```
                                ;SCAN CONTROL WORD TABLE.
                                ;
                                ;CONTROL WORDS USED TO SET AND CLEAR THE MAINTENANCE FLOPS AND SCAN WORDS.
                                ;THE MAINT. FLOPS AND SCAN WORDS SET OR CLEARED ARE GIVEN BELOW IN
                                ;REFERENCE TO WORD 0, WORD 2, WORD 4 & WORD 6 OF A SCAN MODULE.
                                ;THESE BITS, WHEN USED IN BYTE INSTRUCTIONS CORRESPOND TO BITS 8, 9, 10 & 11.
                                ;
                                                ; CLEARS:       SETS:
                                ;
001302  000000          SCW00:  0       ; NONE          ALL
001304  000001          SCW01:  1       ; 0             2,4,6
001306  000002          SCW02:  2       ; 2             0,4,6
001310  000003          SCW03:  3       ; 0,2           4,6
001312  000004          SCW04:  4       ; 4             0,2,6
001314  000005          SCW05:  5       ; 0,4           2,6
001316  000006          SCW06:  6       ; 2,4           0,6
001320  000007          SCW07:  7       ; 0,2,4         6
001322  000010          SCW10:  10      ; 6             0,2,4
001324  000011          SCW11:  11      ; 0,6           2,4
001326  000012          SCW12:  12      ; 2,6           0,4
001330  000013          SCW13:  13      ; 0,2,6         4
001332  000014          SCW14:  14      ; 4,6           0,2
001334  000015          SCW15:  15      ; 0,4,6         2
001336  000016          SCW16:  16      ; 2,4,6         0
001340  000017          SCW17:  17      ; ALL           NONE
001342  000000          SCW20:  0       ;SCW20 THRU SCW77 SETS & CLEARS WORDS AS
001344  000016          SCW21:  16      ;GIVEN ABOVE FOR THE SAME CONSTANTS. (SCW21 IS
001346  000001          SCW22:  1       ;THE SAME AS FOR SCW16.)
001350  000015          SCW23:  15
001352  000002          SCW24:  2
001354  000014          SCW25:  14
001356  000003          SCW26:  3
001360  000013          SCW27:  13
001362  000004          SCW30:  4
001364  000012          SCW31:  12
001366  000005          SCW32:  5
001370  000011          SCW33:  11
001372  000006          SCW34:  6
001374  000010          SCW35:  10
001376  000007          SCW36:  7
001400  000000          SCW37:  0
001402  000007          SCW40:  7
001404  000010          SCW41:  10
001406  000006          SCW42:  6
001410  000011          SCW43:  11
001412  000005          SCW44:  5
001414  000012          SCW45:  12
001416  000004          SCW46:  4
001420  000013          SCW47:  13
001422  000003          SCW50:  3
001424  000014          SCW51:  14
001426  000002          SCW52:  2
001430  000015          SCW53:  15
001432  000001          SCW54:  1
001434  000016          SCW55:  16
001436  000000          SCW56:  0
```

```
   936  001440  000017                    SCW57:  17
   937  001442  000005                    SCW60:  5
   938  001444  000012                    SCW61:  12
   939  001446  000005                    SCW62:  5
   940  001450  000012                    SCW63:  12
   941  001452  000005                    SCW64:  5
   942  001454  000012                    SCW65:  12
   943  001456  000005                    SCW66:  5
   944  001460  000012                    SCW67:  12
   945  001462  000000                    SCW70:  0
   946  001464  000017                    SCW71:  17
   947  001466  000000                    SCW72:  0
   948  001470  000017                    SCW73:  17
   949  001472  000000                    SCW74:  0
   950  001474  000017                    SCW75:  17
   951  001476  000000                    SCW76:  0
   952  001500  000017                    SCW77:  17
   953
```

```
                        ;DISTRIBUTE CONTROL WORD TABLE.
                        ;WORDS USED TO DIRECTLY SET DISTRIBUTE BOARDS IN BOTH THE DISTRIBUTE
                        ;TESTS AND IN THE DISTRIBUTE-JUMPERED-TO-SCAN-TEST.

001502  000000          DCW00:  0
001504  000001          DCW01:  1
001506  000002          DCW02:  2
001510  000004          DCW03:  4
001512  000010          DCW04:  10
001514  000020          DCW05:  20
001516  000040          DCW06:  40
001520  000100          DCW07:  100
001522  000200          DCW10:  200
001524  000400          DCW11:  400
001526  001000          DCW12:  1000
001530  002000          DCW13:  2000
001532  004000          DCW14:  4000
001534  010000          DCW15:  10000
001536  020000          DCW16:  20000
001540  040000          DCW17:  40000
001542  100000          DCW20:  100000
001544  177776          DCW21:  177776
001546  177775          DCW22:  177775
001550  177773          DCW23:  177773
001552  177767          DCW24:  177767
001554  177757          DCW25:  177757
001556  177737          DCW26:  177737
001560  177677          DCW27:  177677
001562  177577          DCW30:  177577
001564  177377          DCW31:  177377
001566  176777          DCW32:  176777
001570  175777          DCW33:  175777
001572  173777          DCW34:  173777
001574  167777          DCW35:  167777
001576  157777          DCW36:  157777
001600  137777          DCW37:  137777
001602  077777          DCW40:  077777
001604  052525          DCW41:  052525
001606  125252          DCW42:  125252
001610  034163          DCW43:  034163
001612  146314          DCW44:  146314
001614  070707          DCW45:  070707
001616  107070          DCW46:  107070
001620  007417          DCW47:  007417
001622  170360          DCW50:  170360
001624  041045          DCW51:  041045
001626  136732          DCW52:  136732
001630  154321          DCW53:  154321
001632  023456          DCW54:  023456
001634  133333          DCW55:  133333
001636  044444          DCW56:  044444
001640  000000          DCW57:  000000
001642  177777          DCW60:  177777
001644  000000          DCW61:  000000
001646  111111          DCW62:  111111
```

```
 1010  001650  022222          DCW63:  022222
 1011  001652  133333          DCW64:  133333
 1012  001654  044444          DCW65:  044444
 1013  001656  155555          DCW66:  155555
 1014  001660  066666          DCE67:  066666
 1015  001662  177777          DCW70:  177777
 1016  001664  101010          DCW71:  101010
 1017  001666  111111          DCW72:  111111
 1018  001670  121212          DCW73:  121212
 1019  001672  131313          DCW74:  131313
 1020  001674  141414          DCW75:  141414
 1021  001676  151515          DCW76:  151515
 1022  001700  177777          DCW77:  177777
```

```
1023                                    ;SUBROUTINE TO INITIALIZE GOOD WORDS FOR SCAN CONTROL TESTS.
1024                                    ;(SIMULATE THE ACTION OF SCAN BOARDS IN MAINT. MODE.)
1025
1026  001702  011467  177306          IZGSW:  MOV     (CWP),GMF       ;INIT. GOOD MAINT. FLOP.
1027  001706  005067  177306                  CLR     GW0             ;INIT. GOOD WORD 0.
1028  001712  032767  000001  177274          BIT     #1,GMF
1029  001720  001002                         BNE     IZGSWA
1030  001722  005167  177272                  COM     GW0
1031  001726  005067  177270          IZGSWA: CLR     GW2             ;INIT. GOOD WORD 2.
1032  001732  032767  000002  177254          BIT     #2,GMF
1033  001740  001002                         BNE     IZGSWB
1034  001742  005167  177254                  COM     GW2
1035  001746  005067  177252          IZGSWB: CLR     GW4             ;INIT. GOOD WORD 4.
1036  001752  032767  000004  177234          BIT     #4,GMF
1037  001760  001002                         BNE     IZGSWC
1038  001762  005167  177236                  COM     GW4
1039  001766  005067  177234          IZGSWC: CLR     GW6             ;INIT. GOOD WORD 6.
1040  001772  032767  000010  177214          BIT     #10,GMF
1041  002000  001002                         BNE     IZGSWD
1042  002002  005167  177220                  COM     GW6
1043  002006  000205                  IZGSWD: RTS     $
```

```
1044                                    ;SUBROUTINES TO DELAY
1045
1046  002010  016700  177240          DELAY1: MOV     DLANO1,R0       ;TEMP. STORE DELAY NO. 1.
1047  002014  016701  177240                  MOV     DLAOF1,R1       ;TEMP. STORE DELAY OFFSET 1.
1048  002020  000167  000010                  JMP     DELAY           ;BRANCH.
1049
1050  002024  016700  177226          DELAY2: MOV     DLANO2,R0       ;TEMP. STORE DELAY NO. 2.
1051  002030  016701  177226                  MOV     DLAOF2,R1       ;TEMP. STORE DELAY OFFSET 2.
1052
1053  002034  010067  177226          DELAY:  MOV     R0,DLACTR       ;INIT. DELAY COUNTER
1054  002040  032777  000004  177070          BIT     #SDS,@SWR       ;SHORTEN DELAY?
1055  002046  001402                          BEQ     DLAA            ;NO. - BRANCH.
1056  002050  160167  177212                  SUB     R1,DLACTR       ;YES. - SHORTEN DELAY BY 10%.
1057  002054  032777  000002  177054  DLAA:   BIT     #LDS,@SWR       ;LENGTHEN DELAY?
1058  002062  001402                          BEQ     DLAB            ;NO. - BRANCH.
1059  002064  060167  177176                  ADD     R1,DLACTR       ;YES. - LENGTH DELAY BY 10%.
1060  002070  005367  177172          DLAB:   DEC     DLACTR          ;DECREMENT DELAY COUNTER. IS IT ZERO?
1061  002074  001375                          BNE     DLAB            ;NO. - BRANCH.
1062  002076  000205                          RTS     $               ;YES. - RETURN.
1063
```

...

```
1064                                    ;ARE THERE SCAN BOARDS TO BE TESTED AND/OR IS TESTING REQUESTED?
1065
1066  002100  032767  000120  177034  PREST:  BIT     #JF+JXF,FLAGS   ;TEST DJMPRS WHERE DATA HAS
1067  002106  001406                          BEQ     PRESTA          ;BEEN SPECIFIED?
1068  002110  032767  000200  177024          BIT     #DATF,FLAGS
1069  002116  001402                          BEQ     PRESTA          ;NO. - BRANCH.
1070  002120  000167  002526                  JMP     IDJ             ;YES. - GO DIRECTLY TO DJMPRS TESTS.
1071  002124  026727  176766  000116  PRESTA: CMP     LOSA,#'N        ;TEST SCAN BOARDS?
1072  002132  001002                          BNE     PRESTB          ;YES. - BRANCH.
1073  002134  000167  001570                  JMP     PREDT           ;NO. - BRANCH.
1074  002140  032767  000004  176774  PRESTB: BIT     #MOD,FLAGS      ;MODULE TEST MODE?
1075  002146  001002                          BNE     STMBEG          ;YES. - BRANCH.
1076  002150  000167  000074                  JMP     STOBEG          ;NO. - BRANCH.
1077
1078                                    ;SCAN TEST M
1079                                    ;CHECK THAT ALL SCAN BOARD ADDRESSES NOT GIVEN BY THE OPERATOR
1080                                    ;DO NOT RESPOND TO A TEST INST.  AN ERROR INDICATES THAT
1081                                    ;THE BOARD IS RESPONDING TO ADDRESS(ES) OTHER THAN ITS OWN
1082                                    ;AND IS BAD.
1083
1084  002154  016702  176736          STMBEG: MOV     LOSA,CADR       ;INIT. CONTROL ADRS. POINTER.
1085  002160  042702  003777                  BIC     #3777,CADR      ;FORCE IT TO 164000.
1086  002164  012767  002214  175612          MOV     #STMTS,4        ;INIT. TIMEOUT-ERROR TRAP VECTOR.
1087  002172  112767  000100  176743          MOVB    #SF,RFLGS       ;INIT. ERROR RELEVANCY FLAGS.
1088  002200  104400                          SCOPE                   ;SCOPE TRAP.
1089  002202  020267  176710          STMLOP: CMP     CADR,LOSA       ;EXCLUDE TESTING THIS ADDRESS.
1090  002206  001410                          BEQ     STMADV          ;YES. - BRANCH.  (IT'S WHERE THE BOARD IS.)
1091  002210  005712                          TST     (CADR)          ;TEST SCAN ADRS.
1092  002212  000402                          BR      STMERR          ;IF NO TRAP OCCURS, GO TO "STMERR" -
1093  002214  022626                  STMTS:  CMP     (STP)+,(STP)+   ;IF A TRAP OCCURS IT RETURNS HERE AS "OK".
1094  002216  104777                  STMOK:  CONTROL                 ;CONTROL TRAP.
1095  002220  104000                  STMERR: ERROR                   ;ERROR TRAP.
1096  002222  020227  167770                  CMP     CADR,#167770    ;ALL ADRS. CONFIGURATIONS TESTED?
1097  002226  001403                          BEQ     STMEND          ;YES.
1098  002230  062702  000010          STMADV: ADD     #10,CADR        ;NO. - ADVANCE CONTROL ADRS. PTR.
1099  002234  000762                          BR      STMLOP          ;BRANCH.
1100  002236  012767  000006  175540  STMEND: MOV     #6,4            ;INIT. (CLOSE) TIMEOUT-ERROR TRAP VECTOR.
1101  002244  000167  000000                  JMP     STOBEG          ;BRANCH.
```

```
1102                                    ;SCAN TEST 0
1103                                    ;CHECK THAT ALL SCAN ADDRESSES GIVEN BY THE OPERATOR AT LEAST RESPOND
1104                                    ;TO A TST INST.  AN ERROR (VIA TIME OUT-ERROR TRAP) INDICATES EITHER
1105                                    ;A BAD ADDRESS OR A NON-EXISTANT ADDRESS WAS GIVEN BY THE OPERATOR.
1106
1107  002250  016702  176642           STOBEG: MOV     LOSA,CADR       ;INIT. CONTROL ADRS. POINTER.
1108  002254  012767  002276  175522           MOV     #STOTS,4        ;INIT. TIME OUT-ERROR TRAP VECTOR.
1109  002262  112767  000100  176653           MOVB    #SF,RFLGS       ;INIT. ERROR RELEVANCY FLAGS.
1110  002270  104400                           SCOPE                   ;SCOPE TRAP.
1111  002272  005712                  STOLOP: TST     (CADR)          ;TEST A SCAN ADDRESS.
1112  002274  000402                           BR      STOOK           ;IF NO TRAP OCCURS, GO TO "STOOK".-
1113  002276  022626                  STOTS:  CMP     (STP)+,(STP)+   ;IF A TRAP OCCURS, GO TO "STOERR" VIA-
1114  002300  000401                           BR      STOERR          ;A TIME OUT-ERROR TRAP TO VECTOR 4.
1115  002302  104777                  STOOK:  CONTROL                 ;CONTROL TRAP.
1116  002304  104000                  STOERR: ERROR                   ;ERROR TRAP.
1117  002306  020267  176606                   CMP     CADR,HISA       ;ALL GIVEN ADDRESSES TESTED?
1118  002312  001403                           BEQ     STOEND          ;YES. - BRANCH.
1119  002314  062702  000002                   ADD     #2,CADR         ;NO. - ADVANCE CONTROL ADRS. PTR.
1120  002320  000764                           BR      STOLOP          ;BRANCH.
1121  002322  012767  000006  175454  STOEND: MOV     #6,4            ;INIT. (CLOSE) TIMEOUT-ERROR TRAP VECTOR.
1122  002330  000167  000000                   JMP     ST1BEG          ;BRANCH.
```

```
 1123
 1124                                   ;SCAN TEST 1
 1125                                   ;CHECK THAT MAINTENANCE FLOP ACCESS OF ALL SCAN ADDRESSES GIVEN
 1126                                   ;BY THE OPERATOR AT LEAST RESPOND PROPERLY TO A TST INST.
 1127
 1128  002334  016702  176556          ST1BEG: MOV     LOSA,CADR       ;INIT. CONTROL ADDRESS POINTER.
 1129  002340  012767  002364  175436          MOV     #ST1TS,4        ;INIT. TIME OUT-ERROR TRAP VECTOR.
 1130  002346  112767  000100  176567          MOVB    #SF,RFLGS       ;INIT. ERROR RELEVANCY FLAGS.
 1131  002354  104400                          SCOPE                   ;SCOPE TRAP.
 1132  002356  105762  000001          ST1LOP: TSTB    +1(CADR)        ;TEST ACCESS TO MAINT. FLOPS.
 1133  002362  000402                          BR      ST1OK           ;IF NO TRAP OCCURS, GO TO "ST1OK".-
 1134  002364  022626                  ST1TS:  CMP     (STP)+,(STP)+   ;IF A TRAP OCCURS, GO TO "ST1ERR" VIA-
 1135  002366  000401                          BR      ST1ERR          ;A TIME OUT-ERROR TRAP TO VECTOR 4.
 1136  002370  104777                  ST1OK:  CONTROL                 ;CONTROL TRAP.
 1137  002372  104000                  ST1ERR: ERROR                   ;ERROR TRAP.
 1138  002374  020267  176530                  CMP     CADR,HISAX      ;ALL MAINT. FLOP ACCESSES TESTED?
 1139  002400  001403                          BEQ     ST1END          ;YES. - BRANCH.
 1140  002402  062702  000010                  ADD     #10,CADR        ;NO. - ADVANCE CONTROL ADRS. PTR.
 1141  002406  000763                          BR      ST1LOP          ;BRANCH. (NEXT SUB-TEST LOOP)
 1142  002410  012767  000006  175366  ST1END: MOV     #6,4            ;INIT. TIME OUT-ERROR TRAP VECTOR.
 1143  002416  000167  000000                  JMP     ST2BEG          ;BRANCH.
```

```
1144                                    ;SCAN TEST 2
1145                                    ;CHECK THAT ALL MAINTENANCE FLOPS ARE RESET AND THAT ALL SCAN
1146                                    ;WORD BITS ARE SET BY THE ACTION OF THE RESET INSTRUCTION
1147
1148  002422  016702  176470            ST2BEG: MOV     LOSA,CADR       ;INIT. CONTROL ADDRESS POINTER.
1149  002426  012704  001302                    MOV     #SCW00,CWP      ;INIT. CONTROL WORD POINTER.
1150  002432  004567  177244                    JSR     $,IZGSW         ;INIT. "GOOD" WORDS.
1151  002436  112767  000172  176477           MOVB    #SRF,RFLGS      ;INIT. ERROR RELEVANCY FLAGS.
1152  002444  104400                          SCOPE                   ;SCOPE TRAP.
1153  002446  000005                  ST2LOP: RESET                   ;CLEAR ALL MAINT. FLOPS, SET ALL SCAN BITS.
1154  002450  116267  000001  176552           MOVB    +1(CADR),TMF    ;READ MAINT. FLOPS.
1155  002456  004567  177326                    JSR     $,DELAY1        ;WAIT.
1156  002462  016267  000000  176544           MOV     +0(CADR),TW0    ;READ SCAN WORD 0.
1157  002470  016267  000002  176540           MOV     +2(CADR),TW2    ;READ SCAN WORD 2.
1158  002476  016267  000004  176534           MOV     +4(CADR),TW4    ;READ SCAN WORD 4.
1159  002504  016267  000006  176530           MOV     +6(CADR),TW6    ;READ SCAN WORD 6.
1160  002512  026767  176512  176474           CMP     TMF,GMF         ;MAINT. FLOPS CLEARED?
1161  002520  001021                          BNE     ST2ERR          ;NO. - BRANCH.
1162  002522  026767  176506  176470           CMP     TW0,GW0         ;YES. - SCAN WORD 0, ALL BITS SET?
1163  002530  001015                          BNE     ST2ERR          ;NO. - BRANCH.
1164  002532  026767  176500  176462           CMP     TW2,GW2         ;YES. - SCAN WORD 2, ALL BITS SET?
1165  002540  001011                          BNE     ST2ERR          ;NO. - BRANCH.
1166  002542  026767  176472  176454           CMP     TW4,GW4         ;YES. - SCAN WORD 4, ALL BITS SET?
1167  002550  001005                          BNE     ST2ERR          ;NO. - BRANCH.
1168  002552  026767  176464  176446           CMP     TW6,GW6         ;YES. - SCAN WORD 6, ALL BITS SET?
1169  002560  001001                          BNE     ST2ERR          ;NO. - BRANCH.
1170  002562  104777                  ST2OK:  CONTROL                 ;CONTROL TRAP.
1171  002564  104000                  ST2ERR: ERROR                   ;ERROR TRAP.
1172  002566  020267  176336                   CMP     CADR,HISAX      ;ALL MAINT. FLOPS & SCAN WORDS TESTED?
1173  002572  001403                          BEQ     ST2END          ;YES. - BRANCH.
1174  002574  062702  000010                   ADD     #10,CADR        ;NO. - ADVANCE CONTROL ADRS. PTR.
1175  002600  000722                          BR      ST2LOP          ;BRANCH. (NEXT SUB-TEST LOOP)
1176  002602  000167  000000          ST2END: JMP     ST3BEG          ;BRANCH
```

```
1177
1178                                    ;SCAN TEST 3
1179                                    ;CHECK THAT ALL MAINTENANCE FLOPS CAN BE SET AND THAT ALL SCAN
1180                                    ;WORDS CAN BE CLEARED.
1181
1182  002606  016702  176304          ST3BEG: MOV     LOSA,CADR       ;INIT. CONTROL ADDRESS POINTER.
1183  002612  012704  001340                  MOV     #SCW17,CWP      ;INIT. CONTROL WORD POINTER.
1184  002616  004567  177060                  JSR     $,IZGSW         ;INIT. "GOOD" WORDS.
1185  002622  112767  000172  176313          MOVB    #SRF,RFLGS      ;INIT. ERROR RELEVANCY FLAGS.
1186  002630  104400                          SCOPE                   ;SCOPE TRAP.
1187  002632  111462  000001          ST3LOP: MOVB    (CWP),+1(CADR)  ;SET ALL MAINT FLOPS, CLEAR ALL SCAN BITS.
1188  002636  116267  000001  176364          MOVB    +1(CADR),TMF    ;READ MAINT. FLOPS
1189  002644  004567  177140                  JSR     $,DELAY1        ;WAIT
1190  002650  016267  000000  176356          MOV     +0(CADR),TW0    ;READ SCAN WORD 0.
1191  002656  016267  000002  176352          MOV     +2(CADR),TW2    ;READ SCAN WORD 2.
1192  002664  016267  000004  176346          MOV     +4(CADR),TW4    ;READ SCAN WORD 4.
1193  002672  016267  000006  176342          MOV     +6(CADR),TW6    ;READ SCAN WORD 6.
1194  002700  026767  176324  176306          CMP     TMF,GMF         ;MAINT. FLOPS SET?
1195  002706  001021                          BNE     ST3ERR          ;NO. - BRANCH.
1196  002710  026767  176320  176302          CMP     TW0,GW0         ;YES. - SCAN WORD 0 CLEARED?
1197  002716  001015                          BNE     ST3ERR          ;NO. - BRANCH.
1198  002720  026767  176312  176274          CMP     TW2,GW2         ;YES. - SCAN WORD 2 CLEARED?
1199  002726  001011                          BNE     ST3ERR          ;NO. - BRANCH.
1200  002730  026767  176304  176266          CMP     TW4,GW4         ;YES. - SCAN WORD 4 CLEARED?
1201  002736  001005                          BNE     ST3ERR          ;NO. - BRANCH.
1202  002740  026767  176276  176260          CMP     TW6,GW6         ;YES. - SCAN WORD 6 CLEARED?
1203  002746  001001                          BNE     ST3ERR          ;NO. - BRANCH.
1204  002750  104777                  ST3OK:  CONTROL                 ;YES. - CONTROL TRAP.
1205  002752  104000                  ST3ERR: ERROR                   ;ERROR TRAP.
1206  002754  020267  176150                  CMP     CADR,HISAX      ;ALL GIVEN ADDRESSES TESTED?
1207  002760  001403                          BEQ     ST3END          ;YES. - BRANCH.
1208  002762  062702  000010                  ADD     #10,CADR        ;NO. - ADVANCE CONTROL ADRS. PTR.
1209  002766  000721                          BR      ST3LOP          ;BRANCH (NEXT SUB-TEST LOOP)
1210  002770  000167  000000          ST3END: JMP     ST4BEG          ;BRANCH.
```

```
1211                                    ;SCAN TEST 4
1212                                    ;CHECK THAT ALL MAINTENANCE FLOPS ARE RESET AND THAT ALL SCAN
1213                                    ;WORD BITS ARE SET BY THE ACTION OF THE RESET INSTRUCTION.
1214
1215  002774  016702  176116          ST4BEG: MOV     LOSA,CADR       ;INIT. CONTROL ADDRESS POINTER.
1216  003000  012704  001302                  MOV     #SCW00,CWP      ;INIT. CONTROL WORD POINTER.
1217  003004  004567  176672                  JSR     $,IZGSW         ;INIT. "GOOD" WORDS.
1218  003010  112767  000172  176125         MOVB    #SRF,RFLGS      ;INIT. ERROR RELEVANCY FLAGS.
1219  003016  104400                          SCOPE                   ;SCOPE TRAP.
1220  003020  000005                  ST4LOP: RESET                   ;CLEAR ALL MAINT. FLOPS, SET ALL SCAN BITS.
1221  003022  116267  000001  176200         MOVB    +1(CADR),TMF    ;READ MAINT. FLOPS
1222  003030  004567  176754                  JSR     $,DELAY1        ;WAIT
1223  003034  016267  000000  176172         MOV     +0(CADR),TW0    ;READ SCAN WORD 0.
1224  003042  016267  000002  176166         MOV     +2(CADR),TW2    ;READ SCAN WORD 2.
1225  003050  016267  000004  176162         MOV     +4(CADR),TW4    ;READ SCAN WORD 4.
1226  003056  016267  000006  176156         MOV     +6(CADR),TW6    ;READ SCAN WORD 6.
1227  003064  026767  176140  176122         CMP     TMF,GMF         ;MAINT. FLOPS CLEARED?
1228  003072  001021                          BNE     ST4ERR          ;NO. - BRANCH.
1229  003074  026767  176134  176116         CMP     TW0,GW0         ;YES. - SCAN WORD 0, ALL BITS SET?
1230  003102  001015                          BNE     ST4ERR          ;NO. - BRANCH.
1231  003104  026767  176126  176110         CMP     TW2,GW2         ;YES. - SCAN WORD 2, ALL BITS SET?
1232  003112  001011                          BNE     ST4ERR          ;NO. - BRANCH.
1233  003114  026767  176120  176102         CMP     TW4,GW4         ;YES. - SCAN WORD 4, ALL BITS SET?
1234  003122  001005                          BNE     ST4ERR          ;NO. - BRANCH.
1235  003124  026767  176112  176074         CMP     TW6,GW6         ;YES. - SCAN WORD 6, ALL BITS SET?
1236  003132  001001                          BNE     ST4ERR          ;NO. - BRANCH.
1237  003134  104777                  ST4OK:  CONTROL                 ;CONTROL TRAP.
1238  003136  104000                  ST4ERR: ERROR                   ;ERROR TRAP.
1239  003140  020267  175764                  CMP     CADR,HISAX      ;ALL MAINT. FLOPS & SCAN WORDS TESTED
1240  003144  001403                          BEQ     ST4END          ;YES. - BRANCH.
1241  003146  062702  000010                  ADD     #10,CADR        ;NO. - ADVANCE CONTROL ADRS. PTR.
1242  003152  000722                          BR      ST4LOP          ;BRANCH. (NEXT SUB-TEST LOOP)
1243  003154  000167  000000          ST4END: JMP     ST5BEG          ;BRANCH.
```

```
                                        ;SCAN TEST 5
                                        ;CHECK THAT ALL MAINTENANCE FLOPS CAN BE SET AND THAT ALL SCAN
                                        ;WORDS CAN BE CLEARED.

003160  016702  175732        ST5BEG: MOV     LOSA,CADR       ;INIT. CONTROL ADDRESS POINTER.
003164  012704  001340                MOV     #SCW17,CWP      ;INIT. CONTROL WORD POINTER.
003170  004567  176506                JSR     $,IZGSW         ;INIT. "GOOD" WORDS.
003174  112767  000172  175741        MOVB    #SRF,RFLGS      ;INIT. ERROR RELEVANCY FLAGS.
003202  104400                        SCOPE                   ;SCOPE TRAP.
003204  111462  000001        ST5LOP: MOVB    (CWP),+1(CADR)  ;SET ALL MAINT FLOPS, CLEAR ALL SCAN BITS.

003210  116267  000001  176012        MOVB    +1(CADR),TMF    ;READ MAINT. FLOPS
003216  004567  176566                JSR     $,DELAY1        ;WAIT
003222  016267  000000  176004        MOV     +0(CADR),TW0    ;READ SCAN WORD 0.
003230  016267  000002  176000        MOV     +2(CADR),TW2    ;READ SCAN WORD 2.
003236  016267  000004  175774        MOV     +4(CADR),TW4    ;READ SCAN WORD 4.
003244  016267  000006  175770        MOV     +6(CADR),TW6    ;READ SCAN WORD 6.
003252  026767  175752  175734        CMP     TMF,GMF         ;MAINT. FLOPS SET?
003260  001021                        BNE     ST5ERR          ;NO. - BRANCH.
003262  026767  175746  175730        CMP     TW0,GW0         ;YES. - SCAN WORD 0 CLEARED?
003270  001015                        BNE     ST5ERR          ;NO. - BRANCH.
003272  026767  175740  175722        CMP     TW2,GW2         ;YES. - SCAN WORD 2 CLEARED?
003300  001011                        BNE     ST5ERR          ;NO. - BRANCH.
003302  026767  175732  175714        CMP     TW4,GW4         ;YES. - SCAN WORD 4 CLEARED?
003310  001005                        BNE     ST5ERR          ;NO. - BRANCH.
003312  026767  175724  175706        CMP     TW6,GW6         ;YES. - SCAN WORD 6 CLEARED?
003320  001001                        BNE     ST5ERR          ;NO. - BRANCH.
003322  104777                ST5OK:  CONTROL                 ;YES. - CONTROL TRAP.
003324  104000                ST5ERR: ERROR                   ;ERROR TRAP.
003326  020267  175576                CMP     CADR,HISAX      ;ALL GIVEN ADDRESSES TESTED?
003332  001403                        BEQ     ST5END          ;YES. - BRANCH.
003334  062702  000010                ADD     #10,CADR        ;NO. - ADVANCE CONTROL ADRS. PTR.
003340  000721                        BR      ST5LOP          ;BRANCH (NEXT SUB-TEST LOOP)
003342  000167  000000        ST5END: JMP     ST6BEG          ;BRANCH.
```

```
1278                                    ;SCAN TEST 6
1279                                    ;CHECK THAT ALL MAINTENCE FLOPS CAN BE RESET AND THAT ALL SCAN
1280                                    ;WORD BITS CAN BE SET.
1281  003346  016702  175544            ST6BEG: MOV     LOSA,CADR       ;INIT. CONTROL ADDRESS POINTER.
1282  003352  012704  001302                    MOV     #SCW00,CWP      ;INIT. CONTROL WORD POINTER.
1283  003356  004567  176320                    JSR     $,IZGSW         ;INIT. "GOOD" WORDS.
1284  003362  112767  000172  175553            MOVB    #SRF,RFLGS              ;INIT. ERROR RELEVANCY FLAGS.
1285  003370  104400                            SCOPE                   ;SCOPE TRAP.
1286  003372  111462  000001            ST6LOP: MOVB    (CWP),+1(CADR)  ;CLEAR ALL MAINT. FLOPS, SET ALL SCAN BIT
1287  003376  116267  000001  175624            MOVB    +1(CADR),TMF    ;READ MAINT. FLOPS
1288  003404  004567  176400                    JSR     $,DELAY1        ;WAIT
1289  003410  016267  000000  175616            MOV     +0(CADR),TW0    ;READ SCAN WORD 0.
1290  003416  016267  000002  175612            MOV     +2(CADR),TW2    ;READ SCAN WORD 2.
1291  003424  016267  000004  175606            MOV     +4(CADR),TW4    ;READ SCAN WORD4.
1292  003432  016267  000006  175602            MOV     +6(CADR),TW6    ;READ SCAN WORD 6.
1293  003440  026767  175564  175546            CMP     TMF,GMF         ;MAINT. FLOPS CLEARED?
1294  003446  001021                            BNE     ST6ERR          ;NO. - BRANCH.
1295  003450  026767  175560  175542            CMP     TW0,GW0         ;YES. - SCAN WORD 0, ALL BITS SET?
1296  003456  001015                            BNE     ST6ERR          ;NO. - BRANCH.
1297  003460  026767  175552  175534            CMP     TW2,GW2         ;YES. - SCAN WORD 2, ALL BITS SET?
1298  003466  001011                            BNE     ST6ERR          ;NO. - BRANCH.
1299  003470  026767  175544  175526            CMP     TW4,GW4         ;YES. - SCAN WORD 4, ALL BITS SET?
1300  003476  001005                            BNE     ST6ERR          ;NO. - BRANCH.
1301  003500  026767  175536  175520            CMP     TW6,GW6         ;YES. - SCAN WORD 6, ALL BITS SET?
1302  003506  001001                            BNE     ST6ERR          ;NO. - BRANCH.
1303  003510  104777                    ST6OK:  CONTROL                 ;CONTROL TRAP.
1304  003512  104000                    ST6ERR: ERROR                   ;ERROR TRAP.
1305  003514  020267  175410                    CMP     CADR,HISAX      ;ALL MAINT. FLOPS & SCAN WORDS TEST.
1306  003520  001403                            BEQ     ST6END          ;YES. - BRANCH.
1307  003522  062702  000010                    ADD     #10,CADR        ;NO. - ADVANCE CONTROL ADRS. PTR.
1308  003526  000721                            BR      ST6LOP          ;BRANCH. (NEXT SUB-TEST LOOP).
1309  003530  000167  000000            ST6END: JMP     ST7BEG          ;BRANCH.
```

```
 1310
 1311
 1312                                   ;SCAN TEST 7
 1313                                   ;CHECK THAT ALL MAINTENANCE FLOPS AND SCAN WORDS WILL SET TO ALL POSSIBLE CONFIGURATIONS
 1314
 1315  003534  016702  175356          ST7BEG: MOV     LOSA,CADR       ;INIT. CONTROL ADDRESS POINTER.
 1316  003540  112767  000172  175375          MOVB    #SRF,RFLGS      ;INIT. ERROR RELEVANCY FLAGS.
 1317  003546  012704  001302          ST7L2:  MOV     #SCW00,CWP      ;INIT. CONTROL WORD POINTER.
 1318  003552  104400                          SCOPE                   ;SCOPE TRAP.
 1319  003554  004567  176122          ST7L1:  JSR     $,IZGSW         ;INIT. "GOOD" WORDS.
 1320  003560  111462  000001                  MOVB    (CWP),+1(CADR) ;SET MAINT. FLOPS AS PER CONTROL WORD PTR.
 1321  003564  116267  000001  175436          MOVB    +1(CADR),TMF    ;READ MAINT. FLOPS
 1322  003572  004567  176212                  JSR     $,DELAY1        ;WAIT.
 1323  003576  016267  000000  175430          MOV     +0(CADR),TW0    ;READ SCAN WORD 0.
 1324  003604  016267  000002  175424          MOV     +2(CADR),TW2    ;READ SCAN WORD 2.
 1325  003612  016267  000004  175420          MOV     +4(CADR),TW4    ;READ SCAN WORD 4.
 1326  003620  016267  000006  175414          MOV     +6(CADR),TW6    ;READ SCAN WORD 6.
 1327  003626  026767  175376  175360          CMP     TMF,GMF         ;MAINT. FLOPS OK?
 1328  003634  001021                          BNE     ST7ERR          ;NO. - BRANCH.
 1329  003636  026767  175372  175354          CMP     TW0,GW0         ;YES. - SCAN WORD 0 OK?
 1330  003644  001015                          BNE     ST7ERR          ;NO. - BRANCH.
 1331  003646  026767  175364  175346          CMP     TW2,GW2         ;YES. - SCAN WORD 2 OK?
 1332  003654  001011                          BNE     ST7ERR          ;NO. - BRANCH.
 1333  003656  026767  175356  175340          CMP     TW4,GW4         ;YES. - SCAN WORD 4 OK?
 1334  003664  001005                          BNE     ST7ERR          ;NO. - BRANCH.
 1335  003666  026767  175350  175332          CMP     TW6,GW6         ;YES. - SCAN WORD 6 OK?
 1336  003674  001001                          BNE     ST7ERR          ;NO. - BRANCH
 1337  003676  104777          ST7OK:  CONTROL                         ;YES. - CONTROL TRAP.
 1338  003700  104000          ST7ERR: ERROR                           ;ERROR TRAP.
 1339  003702  022467  175572                  CMP     (CWP)+,SCW77    ;ALL CONTROL WORDS TESTED ON THIS WORD?
 1340  003706  001322                          BNE     ST7L1           ;NO. - BRANCH.
 1341  003710  020267  175214                  CMP     CADR,HISAX      ;YES.- ALL SCAN BOARDS TESTED.
 1342  003714  001403                          BEQ     ST7END          ;YES. - BRANCH.
 1343  003716  062702  000010                  ADD     #10,CADR        ;NO. - ADVANCE CONTROL ADRS. PTR.
 1344  003722  000711                          BR      ST7L2           ;BRANCH.
 1345  003724  000167  000000          ST7END: JMP     PREDT           ;BRANCH.
```

```
 1346
 1347                                   ;ARE THERE DISTRIBUTE BOARDS TO BE TESTED AND/OR IS TESTING REQUESTED?
 1348
 1349  003730  026727  175166  000116  PREDT:  CMP     LODA,#'N        ;TEST DISTRIBUTE BOARDS?
 1350  003736  001002                          BNE     PREDTA          ;YES. - BRANCH.
 1351  003740  000167  006416                  JMP     PEND            ;NO. - BRANCH.
 1352  003744  032767  000004  175170  PREDTA: BIT     #MOD,FLAGS      ;MODULE TEST MODE?
 1353  003752  001002                          BNE     DTMBEG          ;YES. - BRANCH.
 1354  003754  000167  000074                  JMP     DTOBEG          ;NO. - BRANCH.
 1355
 1356                                   ;DIST. TEST M
 1357                                   ;CHECK THAT ALL DIST. BOARD ADDRESSES NOT GIVEN BY THE OPERATOR
 1358                                   ;DO NOT RESPOND TO A TEST INST.  AN ERROR INDICATES THAT
 1359                                   ;THE DIST. BOARD IS RESPONDING TO ADDRESS(ES) OTHER THAN ITS OWN
 1360                                   ;AND IS BAD.
 1361
 1362  003760  016702  175136          DTMBEG: MOV     LODA,CADR       ;INIT. CONTROL ADRS. POINTER.
 1363  003764  042702  003777                  BIC     #3777,CADR      ;FORCE IT TO 164000.
 1364  003770  012767  004020  174006          MOV     #DTMTS,4        ;INIT. TIMEOUT-ERROR TRAP VECTOR.
 1365  003776  112767  000200  175137          MOVB    #DF,RFLGS       ;INIT. ERROR RELEVANCY FLAGS.
 1366  004004  104400                          SCOPE                   ;SCOPE TRAP.
 1367  004006  020267  175110          DTMLOP: CMP     CADR,LODA       ;EXCLUDE TESTING THIS ADDRESS.
 1368  004012  001410                          BEQ     DTMADV          ;YES. - BRANCH.  (IT'S WHERE THE BOARD IS.)
 1369  004014  005712                          TST     (CADR)          ;TEST DIST. ADRS.
 1370  004016  000402                          BR      DTMERR          ;IF NO TRAP OCCURS, GO TO "DTMERR" -
 1371  004020  022626                  DTMTS:  CMP     (STP)+,(STP)+   ;IF A TRAP OCCURS IT RETURNS HERE AS "OK".
 1372  004022  104777                  DTMOK:  CONTROL                 ;CONTROL TRAP.
 1373  004024  104000                  DTMERR: ERROR                   ;ERROR TRAP.
 1374  004026  020227  167770                  CMP     CADR,#167770    ;ALL ADRS. CONFIGURATIONS TESTED?
 1375  004032  001403                          BEQ     DTMEND          ;YES.
 1376  004034  062702  000010          DTMADV: ADD     #10,CADR        ;NO. - ADVANCE CONTROL ADRS. PTR.
 1377  004040  000762                          BR      DTMLOP          ;BRANCH.
 1378  004042  012767  000006  173734  DTMEND: MOV     #6,4            ;INIT. (CLOSE) TIMEOUT-ERROR TRAP VECTOR.
 1379  004050  000167  000000                  JMP     DTOBEG          ;BRANCH.
```

```
 1380
 1381
 1382
 1383                                   ;DIST. TEST 0
 1384                                   ;CHECK THAT ALL DISTRIBUTE ADDRESSES GIVEN BY THE OPERATOR AT LEAST
 1385                                   ;RESPOND TO A TST INST.  AN ERROR (VIA TIMEOUT-ERROR TRA) INDICATES
 1386                                   ;EITHER A BAD ADDRESS OR A NON-EXISTENT ADDRESS WAS GIVEN BY THE
 1387                                   ;OPERATOR.
 1388
 1389  004054  016702  175042          DTOBEG: MOV     LODA,CADR       ;INIT. CONTROL ADDRESS POINTER.
 1390  004060  012767  004102  173716          MOV     #DTOTS,4        ;INIT. TIMEOUT-ERROR TRAP VECTOR.
 1391  004066  112767  000200  175047          MOVB    #DF,RFLGS       ;INIT. ERROR RELEVANCY FLAGS.
 1392  004074  104400                          SCOPE                   ;SCOPE TRAP.
 1393  004076  005712                  DTOLOP: TST     (CADR)          ;TEST A DISTRIBUTE ADDRESS.
 1394  004100  000402                          BR      DTOOK           ;IF NO TRAP OCCURS, GO TO "DTOOK".-
 1395  004102  022626                  DTOTS:  CMP     (STP)+,(STP)+   ;IF A TRAP OCCURS, GO TO "DTOERR VIA-
 1396  004104  000401                          BR      DTOERR          ;A TIMEOUT-ERROR TRAP TO VECTOR 4.
 1397  004106  104777                  DTOOK:  CONTROL                 ;CONTROL TRAP.
 1398  004110  104000                  DTOERR: ERROR                   ;ERROR TRAP.
 1399  004112  020267  175006                  CMP     CADR,HIDA       ;ALL GIVEN ADDRESSES TESTED?
 1400  004116  001403                          BEQ     DTOEND          ;YES. - BRANCH.
 1401  004120  062702  000002                  ADD     #2,CADR         ;NO. - ADVANCE CONTROL ADRS. PTR.
 1402  004124  000764                          BR      DTOLOP          ;BRANCH.
 1403  004126  012767  000006  173650  DTOEND: MOV     #6,4            ;INIT. (CLOSE) TIMEOUT-ERROR TRAP VECTOR.
 1404  004134  000167  000000                  JMP     DT1BEG          ;BRANCH.
```

```
 1405                                   ;DIST. TEST 1
 1406                                   ;CHECK THAT ALL DISTRIBUTE WORDS ARE RESET BY THE ACTION OF THE
 1407                                   ;RESET INSTRUCTION.
 1408
 1409  004140  016702  174756          DT1BEG: MOV     LODA,CADR       ;INIT. CONTROL ADDRESS POINTER.
 1410  004144  012704  001502                  MOV     #DCW00,CWP      ;INIT. CONTROL WORD POINTER.
 1411  004150  011467  175042                  MOV     (CWP),GWD       ;INIT "GOOD" WORD.
 1412  004154  112767  000206  174761         MOVB    #DRF,RFLGS      ;INIT ERROR RELEVANCY FLAGS.
 1413  004162  104400                          SCOPE                   ;SCOPE TRAP.
 1414  004164  000005                  DT1LOP: RESET                   ;CLEAR ALL DISTRIBUTE WORDS.
 1415  004166  011267  175040                  MOV     (CADR),TWD      ;READ DIST. WORD.  IS IT ZEROS?
 1416  004172  001001                          BNE     DT1ERR          ;NO. - BRANCH.
 1417  004174  104777                  DT1OK:  CONTROL                 ;YES. - CONTROL TRAP.
 1418  004176  104000                  DT1ERR: ERROR                   ;ERROR TRAP.
 1419  004200  020267  174720                  CMP     CADR,HIDA       ;ALL DIST. WORDS TESTED?
 1420  004204  001403                          BEQ     DT1END          ;YES. - BRANCH.
 1421  004206  062702  000002                  ADD     #2,CADR         ;NO. - ADVANCE CONTROL ADRS. PTR.
 1422  004212  000764                          BR      DT1LOP          ;BRANCH.
 1423  004214  000167  000000          DT1END: JMP     DT2BEG          ;BRANCH.
```

```
1424
1425                                    ;DIST. TEST 2
1426                                    ;CHECK THAT ALL DISTRIBUTE WORDS CAN BE SET TO ALL ONES.
1427
1428  004220  016702  174676          DT2BEG: MOV     LODA,CADR       ;INIT. CONTROL ADDRESS POINTER.
1429  004224  012704  001700                  MOV     #DCW77,CWP      ;INIT. CONTROL WORD POINTER.
1430  004230  011467  174762                  MOV     (CWP),GWD       ;INIT. "GOOD" WORD.
1431  004234  112767  000206  174701          MOVB    #DRF,RFLGS      ;INIT. ERROR RELEVANCY FLAGS.
1432  004242  104400                          SCOPE                   ;SCOPE TRAP.
1433  004244  011412                  DT2LOP: MOV     (CWP),(CADR)    ;SET DISTRIBUTE WORD TO ALL ONES.
1434  004246  011267  174760                  MOV     (CADR),TWD      ;READ DIST. WORD.
1435  004252  026767  174754  174736          CMP     TWD,GWD         ;IS DIST. WORD ALL ONES?
1436  004260  001001                          BNE     DT2ERR          ;NO. - BRANCH.
1437  004262  104777                  DT2OK:  CONTROL                 ;YES. - CONTROL TRAP.
1438  004264  104000                  DT2ERR: ERROR                   ;ERROR TRAP.
1439  004266  020267  174632                  CMP     CADR,HIDA       ;ALL DISTRIBUTE WORDS TESTED?
1440  004272  001403                          BEQ     DT2END          ;YES. - BRANCH.
1441  004274  062702  000002                  ADD     #2,CADR         ;NO. - ADVANCE CONTROL ADRS. PTR.
1442  004300  000761                          BR      DT2LOP          ;BRANCH.
1443  004302  000167  000000          DT2END: JMP     DT3BEG          ;BRANCH.
```

```
 1444
 1445                                   ;DIST. TEST 3
 1446                                   ;CHECK THAT ALL DISTRIBUTE WORDS ARE RESET BY THE ACTION OF THE RESET INSTRUCTION.
 1447
 1448  004306  016702  174610          DT3BEG: MOV     LODA,CADR       ;INIT. CONTROL ADDRESS POINTER.
 1449  004312  012704  001502                  MOV     #DCW00,CWP      ;INIT. CONTROL WORD POINTER.
 1450  004316  011467  174674                  MOV     (CWP),GWD       ;INIT. "GOOD" WORD.
 1451  004322  112767  000206  174613         MOVB    #DRF,RFLGS      ;INIT. ERROR RELEVANCY FLAGS.
 1452  004330  104400                          SCOPE                   ;SCOPE TRAP.
 1453  004332  000005                  DT3LOP: RESET                   ;CLEAR ALL DISTRIBUTE WORDS.
 1454  004334  011267  174672                  MOV     (CADR),TWD      ;READ DIST. WORD.  IS IT ZEROS?
 1455  004340  001001                          BNE     DT3ERR          ;NO. - BRANCH.
 1456  004342  104777                  DT3OK:  CONTROL                 ;YES. - CONTROL TRAP.
 1457  004344  104000                  DT3ERR: ERROR                   ;ERROR TRAP.
 1458  004346  020267  174552                  CMP     CADR,HIDA       ;ALL DIST. WORD TESTED?
 1459  004352  001403                          BEQ     DT3END          ;YES. - BRANCH.
 1460  004354  062702  000002                  ADD     #2,CADR         ;NO. - ADVANCE CONTROL ADRS. PTR.
 1461  004360  000764                          BR      DT3LOP          ;BRANCH.
 1462  004362  000167  000000          DT3END: JMP     DT4BEG          ;BRANCH.
```

```
1463
1464                                    ;DIST. TEST 4
1465                                    ;CHECK THAT ALL DISTRIBUTE WORDS CAN BE SET TO ALL ONES.
1466
1467  004366  016702  174530            DT4BEG: MOV     LODA,CADR       ;INIT. CONTROL ADDRESS POINTER.
1468  004372  012704  001700                    MOV     #DCW77,CWP      ;INIT. CONTROL WORD POINTER.
1469  004376  011467  174614                    MOV     (CWP),GWD       ;INIT. "GOOD" WORD.
1470  004402  112767  000206  174533            MOVB    #DRF,RFLGS      ;INIT. ERROR RELEVANCY FLAGS.
1471  004410  104400                            SCOPE                   ;SCOPE TRAP.
1472  004412  011412                    DT4LOP: MOV     (CWP),(CADR)    ;SET DISTRIBUTE WORD TO ALL ONES.
1473  004414  011267  174612                    MOV     (CADR),TWD      ;READ DIST. WORD.
1474  004420  026767  174606  174570            CMP     TWD,GWD         ;IS DIST. WORD ALL ONES?
1475  004426  001001                            BNE     DT4ERR          ;NO. - BRANCH.
1476  004430  104777                    DT4OK:  CONTROL                 ;YES. - CONTROL TRAP.
1477  004432  104000                    DT4ERR: ERROR                   ;ERROR TRAP.
1478  004434  020267  174464                    CMP     CADR,HIDA       ;ALL DISTRIBUTE WORDS TESTED?
1479  004440  001403                            BEQ     DT4END          ;YES. - BRANCH.
1480  004442  062702  000002                    ADD     #2,CADR         ;NO. - ADVANCE CONTROL ADRS. PTR.
1481  004446  000761                            BR      DT4LOP          ;BRANCH.
1482  004450  000167  000000            DT4END: JMP     DT5BEG          ;BRANCH.
```

```
1483
1484
1485                                    ;DIST. TEST 5
1486                                    ;CHECK THAT ALL DISTRIBUTE WORDS CAN BE CLEARED TO ALL ZEROS.
1487
1488  004454  016702  174442            DT5BEG: MOV     LODA,CADR       ;INIT. CONTROL ADDRESS POINTER.
1489  004460  012704  001502                    MOV     #DCW00,CWP      ;INIT. CONTROL WORD POINTER.
1490  004464  011467  174526                    MOV     (CWP),GWD       ;INIT. "GOOD" WORD.
1491  004470  112767  000206  174445           MOVB    #DRF,RFLGS      ;INIT. ERROR RELEVANCY FLAGS.
1492  004476  104400                            SCOPE                   ;SCOPE TRAP.
1493  004500  011412                    DT5LOP: MOV     (CWP),(CADR)    ;CLEAR DISTRIBUTE WORD TO ALL ZEROS?
1494  004502  011267  174524                    MOV     (CADR),TWD      ;READ DIST. WORD.
1495  004506  026767  174520  174502           CMP     TWD,GWD         ;IS DIST. WORD ALL ZEROS?
1496  004514  001001                            BNE     DT5ERR          ;NO. - BRANCH.
1497  004516  104777                    DT5OK:  CONTROL                 ;YES. - CONTROL TRAP.
1498  004520  104000                    DT5ERR: ERROR                   ;ERROR TRAP.
1499  004522  020267  174376                    CMP     CADR,HIDA       ;ALL DISTRIBUTE WORDS TESTED?
1500  004526  001403                            BEQ     DT5END          ;YES. - BRANCH.
1501  004530  062702  000002                    ADD     #2,CADR         ;NO. - ADVANCE CONTROL ADRS. PTR.
1502  004534  000761                            BR      DT5LOP          ;BRANCH.
1503  004536  000167  000000            DT5END: JMP     DT6BEG          ;BRANCH.
```

```
1504
1505                                    ;DIST. TEST 6
1506                                    ;CHECK THAT ALL DISTRIBUTE WORDS CAN BE SET TO ALL CONFIGURATIONS
1507                                    ;GIVEN IN THE DISTRIBUTE WORD TABLE OF CONSTANTS.
1508
1509  004542  016702  174354            DT6BEG: MOV     LODA,CADR       ;INIT. CONTROL ADDRESS POINTER.
1510  004546  112767  000206  174367            MOVB    #DRF,RFLGS      ;INIT. ERROR RELEVANCY FLAGS.
1511  004554  012704  001502            DT6L2:  MOV     #DCW00,CWP      ;INIT. CONTROL WORD POINTER.
1512  004560  011467  174432            DT6L1:  MOV     (CWP),GWD       ;INIT. "GOOD" WORD.
1513  004564  104400                            SCOPE                   ;SCOPE TRAP.
1514  004566  011412                            MOV     (CWP),(CADR)    ;WRITE DISTRIBUTE WORD.
1515  004570  011267  174436                    MOV     (CADR),TWD      ;READ DISTRIBUTE WORD.
1516  004574  026767  174432  174414            CMP     TWD,GWD         ;DISTRIBUTE WORD OK?
1517  004602  001001                            BNE     DT6ERR          ;NO. - BRANCH.
1518  004604  104777                    DT6OK:  CONTROL                 ;YES. - CONTROL TRAP.
1519  004606  104000                    DT6ERR: ERROR                   ;ERROR TRAP.
1520  004610  022467  175064                    CMP     (CWP)+,DCW77    ;ALL CONTROL WORDS TESTED ON THIS WORD?
1521  004614  001361                            BNE     DT6L1           ;NO. - BRANCH.
1522  004616  020267  174302                    CMP     CADR,HIDA       ;YES. ALL DISTRIBUTE WORDS TESTED?
1523  004622  001403                            BEQ     DT6END          ;YES. - BRANCH.
1524  004624  062702  000002                    ADD     #2,CADR         ;NO. - ADVANCE CONTROL ADRS. PTR.
1525  004630  000751                            BR      DT6L2           ;BRANCH.
1526  004632  000167  000000            DT6END: JMP     PREDJS          ;BRANCH.
```

```
1527
1528                                    ;ARE DISTRIBUTE BOARDS THAT ARE JUMPERED TO SCAN BOARDS BEING TESTED?
1529
1530  004636  032767  000120  174276  PREDJS: BIT     #JF+JXF,FLAGS   ;TEST DJS?
1531  004644  001002                          BNE     IDJ             ;YES. - BRANCH.
1532  004646  000167  005510                  JMP     PEND            ;NO. - BRANCH.
```

```
1533
1534                                    ;INITIALIZE THE DISTRIBUTE AND SCAN BOARDS.
1535
1536  004652  000005                    IDJ:    RESET                   ;CLEAR ALL DISTRIBUTE WORDS.
1537  004654  016702  174236                    MOV     LOSA,CADR       ;SET ALL MAINT. FLOPS AND
1538  004660  012704  001340                    MOV     #SCW17,CWP      ;CLEAR ALL SCAN WORDS.
1539  004664  111462  000001            IDJA:   MOVB    (CWP),+1(CADR)
1540  004670  020267  174234                    CMP     CADR,HISAX
1541  004674  001403                            BEQ     IDJB
1542  004676  062702  000010                    ADD     #10,CADR
1543  004702  000770                            BR      IDJA
1544  004704  000167  000000            IDJB:   JMP     DJS1BG
1545
```

```
1546
1547                                    ;TEST DJS1
1548                                    ;CHECK THAT SCAN WORDS CAN BE DRIVEN BY DISTRIBUTE WORDS.
1549                                    ;THE DATA WORDS USED ARE THOSE OF THE DISTRIBUTE CONTROL WORD TABLE,
1550                                    ;OR SOLELY THE DATA WORD GIVEN BY THE OPERATOR AT QUERY TIME, IF ANY.
1551
1552  004710  112767  000327  174225  DJS1BG: MOVB    #DSRF,RFLGS     ;INIT. ERROR RELEVANCY FLAGS.
1553  004716  016702  174200          MOV     LODA,CADR       ;INIT. CONTROL ADRS. PTR. (DIST.)
1554  004722  016703  174170          MOV     LOSA,CADRX      ;INIT. CONTROL ADRS. PTR. AUX. (SCAN)
1555  004726  012704  001502  DJS1L2: MOV     #DCW00,CWP      ;INIT. CONTROL WORD POINTER.
1556  004732  032767  000200  174202  BIT     #DATF,FLAGS     ;USE OPERATOR GIVEN DATA?
1557  004740  001402          BEQ     DJS1A           ;NO. -  BRANCH.
1558  004742  012704  001140          MOV     #DATAWD,CWP     ;YES -  RE-INIT. CONTROL WORD PTR.
1559  004746  104400  DJS1A:  SCOPE                   ;SCOPE TRAP
1560  004750  011467  174242  DJS1L1: MOV     (CWP),GWD       ;INIT "GOOD" DIST. WORD.
1561  004754  011467  174240          MOV     (CWP),GW0       ;INIT "GOOD" SCAN WORD.
1562  004760  011412                  MOV     (CWP),(CADR)    ;WRITE DIST. WORD AND, VIA JUMPER, SCAN WORD.
1563  004762  011267  174244          MOV     (CADR),TWD      ;READ DIST. WORD.
1564  004766  004567  175032          JSR     $,DELAY2        ;WAIT.
1565  004772  011367  174236          MOV     (CADRX),TW0     ;READ SCAN WORD.
1566  004776  026767  174230  174212  CMP     TWD,GWD         ;DIST. WORD OK?
1567  005004  001005          BNE     DJS1ER          ;NO. - BRANCH.
1568  005006  026767  174222  174204  CMP     TW0,GW0         ;YES. - SCAN WORD OK?
1569
1570  005014  001001          BNE     DJS1ER          ;NO. - BRANCH.
1571  005016  104777  DJS1OK: CONTROL                 ;YES. - CONTROL TRAP.
1572  005020  104000  DJS1ER: ERROR                   ;ERROR TRAP.
1573  005022  032767  000200  174112  BIT     #DATF,FLAGS     ;USING OPERATOR GIVEN DATA?
1574  005030  001003          BNE     DJS1B           ;YES. - BRANCH.
1575  005032  022467  174642          CMP     (CWP)+,DCW77    ;NO. - ALL CONTROL WORDS USED?
1576  005036  001344          BNE     DJS1L1          ;NO. - BRANCH.
1577  005040  020267  174060  DJS1B:  CMP     CADR,HIDA       ;YES. - ALL ADDRESSES TESTED?
1578  005044  001405          BEQ     DJS1ND          ;YES. - BRANCH.
1579  005046  062702  000002          ADD     #2,CADR         ;NO. - ADVANCE CONTROL ADRS. PTR. (DIST.)
1580  005052  062703  000002          ADD     #2,CADRX        ;ADVANCE CONTROL ADRS. PTR. AUX. (SCAN)
1581  005056  000723          BR      DJS1L2          ;BRANCH.
1582  005060  000167  005276  DJS1ND: JMP     PEND            ;BRANCH.
1583
```

```
1584
1585                                    ;SUB-PROGRAM TO CONTROL ACCEPT/EXERCISE PASSES OF EITHER
1586                                    ;BTEL OR DJMPRS.
1587
1588  005064  012767  005104  174120  AXCTL:  MOV     #AXCA,AXRTN     ;RUN ONE PASS WITH:
1589  005072  012767  014000  174110          MOV     #TTS+ITS,AXSWR  ;NO OPTIONS.
1590  005100  000167  174774                  JMP     PREST
1591
1592  005104  012767  005124  174100  AXCA:   MOV     #AXCB,AXRTN     ;RUN ONE PASS WITH:
1593  005112  012767  014002  174070          MOV     #TTS+ITS+LDS,AXSWR      ;LONGER DELAYS.
1594  005120  000167  174754                  JMP     PREST
1595
1596  005124  012767  005144  174060  AXCB:   MOV     #AXCC,AXRTN     ;RUN ONE PASS WITH:
1597  005132  012767  014004  174050          MOV     #TTS+ITS+SDS,AXSWR      ;SHORTER DELAYS.
1598  005140  000167  174734                  JMP     PREST
1599
1600  005144  012767  005164  174040  AXCC:   MOV     #AXCD,AXRTN
1601  005152  012767  010000  174030          MOV     #TTS,AXSWR
1602  005160  000167  174714                  JMP     PREST
1603
1604  005164  012767  005204  174020  AXCD:   MOV     #AXCE,AXRTN     ;RUN ONE PASS WITH:
1605  005172  012767  010002  174010          MOV     #TTS+LDS,AXSWR  ;ITERATIONS & LONGER DELAYS
1606  005200  000167  174674                  JMP     PREST
1607
1608  005204  012767  005224  174000  AXCE:   MOV     #AXCF,AXRTN     ;RUN ONE PASS WITH:
1609  005212  012767  010004  173770          MOV     #TTS+SDS,AXSWR  ;ITERATIONS & SHORTER DELAYS
1610  005220  000167  174654                  JMP     PREST
1611
1612  005224  012767  005244  173760  AXCF:   MOV     #AXCG,AXRTN     ;RUN ONE PASS WITH:
1613  005232  012767  004000  173750          MOV     #ITS,AXSWR      ;TRACE TRAPS
1614  005240  000167  174634                  JMP     PREST
1615
1616  005244  012767  005264  173740  AXCG:   MOV     #AXCH,AXRTN     ;RUN ONE PASS WITH:
1617  005252  012767  004002  173730          MOV     #ITS+LDS,AXSWR  ;TRACE TRAPS & LONGER DELAYS.
1618  005260  000167  174614                  JMP     PREST
1619
1620  005264  012767  005304  173720  AXCH:   MOV     #AXCI,AXRTN     ;RUN ONE PASS WITH:
1621  005272  012767  004004  173710          MOV     #ITS+SDS,AXSWR  ;TRACE TRAPS & SHORTER DELAYS
1622  005300  000167  174574                  JMP     PREST
1623
1624  005304  012767  005324  173700  AXCI:   MOV     #AXCJ,AXRTN     ;RUN ONE PASS WITH:
1625  005312  012767  000000  173670          MOV     #0,AXSWR        ;ITERATIONS & TRACE TRAPS
1626  005320  000167  174554                  JMP     PREST
1627
1628  005324  012767  005344  173660  AXCJ:   MOV     #AXCK,AXRTN     ;RUN ONE PASS WITH:
1629  005332  012767  000002  173650          MOV     #LDS,AXSWR      ;ITERATIONS, TRACE TRAPS,
1630  005340  000167  174534                  JMP     PREST           ;& LONGER DELAYS
1631
1632  005344  012767  005364  173640  AXCK:   MOV     #AXCL,AXRTN     ;RUN ONE PASS WITH:
1633  005352  012767  000004  173630          MOV     #SDS,AXSWR      ;ITERATIONS, TRACE TRAPS,
1634  005360  000167  174514                  JMP     PREST           ;& SHORTER DELAYS
1635
1636  005364  000167  005006          AXCL:   JMP     PASEND
```

```
1637
1638                                    ;SCOPE TRAP (TRAP) SERVICE ROUTINE TO RECORD THE PC FOR REFERENCE BY EITHER
1639                                    ;SCOPE LOOPS OR ITERATIONS, (BOTH SCOPE & CONTROL TRAPS ENTER HERE FIRST)
1640
1641  005370  011600                    SCOSVC: MOV     (STP),R0        ;DETERMINE THE TYPE OF CALL MADE
1642  005372  105760  177776                    TSTB    -2(R0)          ;(SCOPE OR CONTROL TRAP).
1643  005376  100403                            BMI     CTLSVC          ;CONTROL. - BRANCH.
1644  005400  011667  173550                    MOV     (STP),SCORTN    ;SCOPE. - RECORD THE PC.
1645  005404  000002                            RTI                     ;RETURN.
1646
1647
1648
1649                                    ;CONTROL TRAP (IOT) SERVICE ROUTINE TO CONTROL INTERMITTANT ERROR CONDITIONS
1650                                    ;AND TRACE TRAP, NON-ERROR SCOPE LOOP, & ITERATE SWITCH OPTIONS.
1651
1652  005406  032767  000001  173526  CTLSVC: BIT     #ECF,FLAGS      ;DOES AN ERROR CONDITION EXIST?
1653  005414  001402                            BEQ     CTSVCA          ;NO. - BRANCH.
1654  005416  004567  000346                    JSR     $,IMCTL         ;YES. - GO TO INTERMITTANT CONTROL.
1655  005422  032767  000020  172140  CTSVCA: BIT     #TSS,177570     ;TYPE PROGRAM STATUS?
1656  005430  001402                            BEQ     CSVCA1          ;NO. - BRANCH.
1657  005432  004567  000556                    JSR     $,TYPERR        ;YES. - GO TYPE PROGRAM STATUS.
1658  005436  004567  000054            CSVCA1: JSR     $,TTCTL         ;GO SEE ABOUT TRACE TRAPPING.
1659  005442  032767  040000  172120            BIT     #SLS,177570     ;NON-ERROR SCOPE LOOP?
1660  005450  001403                            BEQ     CTSVCC          ;NO. - BRANCH.
1661  005452  022626                    CTSVCB: CMP     (STP)+,(STP)+   ;YES. - POP STACK ONE TRAP.
1662  005454  000177  173474                    JMP     @SCORTN         ;RETURN TO SCOPE LOOP (OR ITERATION).
1663  005460  032777  004000  173450  CTSVCC: BIT     #ITS,@SWR       ;ITERATE?
1664  005466  001006                            BNE     CTSVCD          ;NO. - BRANCH.
1665  005470  005267  173456                    INC     ITCNT           ;YES. - INCREMENT ITERATION COUNTER.
1666  005474  026767  173452  173406            CMP     ITCNT,ITNO      ;ITERATE THIS TEST OR TEST LOOP AGAIN?
1667  005502  001363                            BNE     CTSVCB          ;YES. - BRANCH.
1668  005504  005067  173442            CTSVCD: CLR     ITCNT           ;NO. - CLEAR ITERATION COUNTER.
1669  005510  062716  000002                    ADD     #2,(STP)        ;ADVANCE RETURN POINT (SKIP THE ERROR CALL).
1670  005514  000002                            RTI                     ;RETURN TO NEXT TEST OR TEST LOOP.
```

```
1671
1672                                    ;SUBROUTINE TO CONTROL THE TRACE TRAP SWITCH OPTION.
1673
1674  005516  016746  172254            TTCTL:  MOV     PS,-(STP)       ;PUT PS ON STACK.
1675  005522  042716  000020                    BIC     #20,(STP)       ;CLEAR "T" BIT (PROVISIONALLY).
1676  005526  032777  010000  173402            BIT     #TTS,@SWR       ;TRACE TRAPS?
1677  005534  001002                            BNE     TTCTLA          ;NO. - BRANCH.
1678  005536  052716  000020                    BIS     #20,(STP)       ;YES. - SET "T" BIT (FINALLY).
1679  005542  012746  005550            TTCTLA: MOV     #TTCTLB,-(STP)  ;PUT RETURN LOC. ON STACK.
1680  005546  000002                            RTI                     ;RETURN (TO NEXT INST.) AND SET/CLEAR "T" BIT.
1681  005550  000205                    TTCTLB: RTS     $               ;RETURN.
1682
1683
1684
1685                                    ;TRACE TRAP SERVICE ROUTINE
1686                                    ;IF THE PROCESSOR IS AN 11/45, PROGRAM INITIALIZATION HAS CHANGED
1687                                    ;THE FOLLOWING INSTRUCTION TO RTT (000006).  OTHERWISE IT IS AS SHOWN.
1688
1689  005552  000002                    TTSVC:  RTI                     ;RETURN.  (THIS INST. WILL BE RTT IF A 11/25 OR 11/45.)
1690
1691
1692                                    ;POWER DOWN SEQUENCE.
1693
1694  005554  010046                    PDOWN:  MOV     R0,-(STP)       ;PUSH R0-R5 ON STACK.
1695  005556  010146                            MOV     R1,-(STP)
1696  005560  010246                            MOV     R2,-(STP)
1697  005562  010346                            MOV     R3,-(STP)
1698  005564  010446                            MOV     R4,-(STP)
1699  005566  010546                            MOV     R5,-(STP)
1700  005570  010667  000026                    MOV     STP,PDSTP       ;SAVE STACK PTR IN CORE.
1701  005574  012767  005624  172222            MOV     #PUP,24         ;INIT. POWER FAIL VECTOR FOR POWER UP.
1702  005602  016746  172170                    MOV     PS,-(STP)       ;ENSURE THAT TRACE TRAP IS OFF.
1703  005606  042716  000020                    BIC     #20,(STP)
1704  005612  004567  177724                    JSR     $,TTCTLA
1705  005616  000240                    PDOWNA: NOP                     ;WAIT FOR POWER UP INTERRUPT.
1706  005620  000776                            BR      PDOWNA
1707  005622  000000                    PDSTP:  0
1708
1709                                    ;POWER UP SEQUENCE.
1710
1711  005624  016706  177772            PUP:    MOV     PDSTP,STP       ;RESTORE STACK PTR.
1712  005630  012605                            MOV     (STP)+,R5       ;POP R0-R5 FROM STACK.
1713  005632  012604                            MOV     (STP)+,R4
1714  005634  012603                            MOV     (STP)+,R3
1715  005636  012602                            MOV     (STP)+,R2
1716  005640  012601                            MOV     (STP)+,R1
1717  005642  012600                            MOV     (STP)+,R0
1718  005644  012767  005554  172152            MOV     #PDOWN,24       ;INIT. POWER FAIL VECTOR FOR POWER DOWN.
1719  005652  005726                            TST     (STP)+          ;POP STACK.
1720  005654  000167  002744                    JMP     INITP           ;RESTART.
1721
```

```
 1722
 1723
 1724                                   ;ERROR TRAP (EMT) SERVICE ROUTINE TO CONTROL ERROR HANDLING.
 1725
 1726  005660  032767  000001  173254  ERRSVC: BIT     #ECF,FLAGS      ;DOES AN ERROR CONDITION ALREADY EXIST?
 1727  005666  001426                          BEQ     ERSVCD          ;NO. - BRANCH. (UNCONDITIONAL TYPEOUT)
 1728  005670  032767  000002  173244          BIT     #IMF,FLAGS      ;DOES AN INTERMITTENT ERROR EXIST?
 1729  005676  001402                          BEQ     ESVCA1          ;NO. - BRANCH.
 1730  005700  004567  000064                  JSR     $,IMCTL         ;YES. - GO TO INTERMITTENT CONTROL.
 1731  005704  032767  020000  171656  ESVCA1: BIT     #STS,177570     ;YES. - SUBSEQUENT ERROR TYPEOUTS?
 1732  005712  001417                          BEQ     ERSVCE          ;YES. - BRANCH.
 1733  005714  032767  100000  171646  ERSVCA: BIT     #HES,177570     ;NO. - HALT?
 1734  005722  001401                          BEQ     ERSVCB          ;NO. - BRANCH.
 1735  005724  000000                          HALT                    ;YES. - HALT.
 1736  005726  032767  040000  171634  ERSVCB: BIT     #SLS,177570     ;ERROR SCOPE LOOP?
 1737  005734  001411                          BEQ     ERSVCG          ;NO. - BRANCH.
 1738  005736  022626                  ERSVCC: CMP     (STP)+,(STP)+   ;YES. - POP STACK ONE TRAP.
 1739  005740  000177  173210                  JMP     @SCORTN         ;RETURN TO SCOPE LOOP
 1740  005744  052767  000001  173170  ERSVCD: BIS     #ECF,FLAGS      ;SET ERROR CONDITION FLAG..
 1741  005752  004567  000236          ERSVCE: JSR     $,TYPERR        ;GO TYPE ERROR MESSAGE.
 1742  005756  000756                          BR      ERSVCA          ;BRANCH.
 1743  005760  042767  000003  173154  ERSVCG: BIC     #ECF+IMF,FLAGS  ;CLEAR ERROR CONDITION FLAGS.
 1744  005766  000002                          RTI                     ;RETURN.
```

```
1745
1746                                        ;SUBROUTINE TO HANDLE INTERMITTENT ERROR CONTROL
1747
1748  005770  032767  000002  173144  IMCTL:  BIT     #IMF,FLAGS      ;DOES INTERMITTENT COND. ALREADY EXIST?
1749  005776  001015                          BNE     IMCTLA          ;YES. - BRANCH.
1750  006000  052767  000002  173134          BIS     #IMF,FLAGS      ;NO. - SET INTERMITTENT FLAG.
1751  006006  004567  004162                  JSR     $,TYPEA         ;NOTIFY OPERATOR OF INTERMITTENT.
1752  006012  044536  052116  051105          .ASCII  " INTERMITTENT!. "
1753  006020  044515  052124  047105
1754  006026  020524  020056
1755  006032  020527  005422          IMCTLA: CMP     $,#CTSVCA       ;DID THE TEST PASS THIS LOOP OK?
1756  006036  001016                          BNE     IMCTLB          ;NO. - BRANCH.
1757  006040  005267  173232                  INC     OKCTR           ;YES. - MC. OKCTR. HAS IT OVERFLOWED?
1758  006044  001030                          BNE     IMCTLC          ;NO. - BRANCH.
1759  006046  004567  004122                  JSR     $,TYPEA         ;YES. - NOTIFY OPERATOR.
1760  006052  047536  041513  047440          .ASCII  " OKC OVERFLOW.  "
1761  006060  042526  043122  047514
1762  006066  027127  020136
1763  006072  000415                          BR      IMCTLC          ;BRANCH.
1764  006074  005267  173174          IMCTLB: INC     ERCTR           ;INC. ERCTR. HAS IT OVERFLOWED?
1765  006100  001012                          BNE     IMCTLC          ;NO. - BRANCH.
1766  006102  004567  004066                  JSR     $,TYPEA         ;YES. - NOTIFY OPERATOR.
1767  006106  042536  041522  047440          .ASCII  " ERC OVERFLOW . "
1768  006114  042526  043122  047514
1769  006122  057127  020056
1770  006126  032767  000100  171434  IMCTLC: BIT     #IMS,177570     ;TYPE "OK" AND "ERR" COUNTERS?
1771  006134  001020                          BNE     IMCTLD          ;NO. - BRANCH.
1772  006136  004567  004032                  JSR     $,TYPEA         ;YES. - TYPE THE COUNTERS.
1773  006142  042536  041522  027057          .ASCII  " ERC/."
1774  006150  004567  004112                  JSR     $,TYPEO
1775  006154  001274                          ERCTR
1776  006156  004567  004012                  JSR     $,TYPEA
1777  006162  047440  041513  027057          .ASCII  " OKC/."
1778  006170  004567  004072                  JSR     $,TYPEO
1779  006174  001276                          OKCTR
1780  006176  020527  005422          IMCTLD: CMP     $,#CTSVCA       ;DID THE TEST PASS THIS LOOP OK?
1781  006202  001401                          BEQ     IMCTLE          ;YES. - BRANCH.
1782  006204  000205                          RTS     $               ;NO. - RETURN TO CONTINUE ERROR REPORTING.
1783  006206  005726                  IMCTLE: TST     (STP)+          ;POP STACK ONE JSR.
1784  006210  000167  177470                  JMP     ESVCA1          ;BRANCH TO CONTINUE ERROR REPORTING.
```

```
 1785                                   ;SUBROUTINE TO TYPE ERROR MESSAGES.
 1786
 1787  006214  004567  001122          TYPERR: JSR     $,SAVE
 1788  006220  004567  003750          TPC:    JSR     $,TYPEA
 1789  006224  050136  027503  020056          .ASCII  " PC/. "
 1790  006232  004567  004030                  JSR     $,TYPEO
 1791  006236  001160                          SAVPC
 1792
 1793  006240  032767  000001  171322          BIT     #SES,177570
 1794  006246  001402                          BEQ     TPST
 1795  006250  000167  001040                  JMP     TEX
 1796
 1797  006254  004567  003714          TPST:   JSR     $,TYPEA
 1798  006260  050040  027523  020056          .ASCII  " PS/. "
 1799  006266  004567  003774                  JSR     $,TYPEO
 1800  006272  001162                          SAVPS
 1801
 1802  006274  004567  003674          TCAD:   JSR     $,TYPEA
 1803  006300  041440  042101  027057          .ASCII  " CAD/."
 1804  006306  004567  003754                  JSR     $,TYPEO
 1805  006312  001166                          SAVCAD
 1806
 1807  006314  004567  003654          TCAX:   JSR     $,TYPEA
 1808  006320  041440  054101  027057          .ASCII  " CAX/."
 1809  006326  132767  000001  172607          BITB    #AXF,RFLGS
 1810  006334  001002                          BNE     TCAXA
 1811  006336  004567  000762                  JSR     $,TYPENR
 1812  006342  004567  003720          TCAXA:  JSR     $,TYPEO
 1813  006346  001170                          SAVCAX
 1814
 1815  006350  004567  003620          TCWP:   JSR     $,TYPEA
 1816  006354  041440  050127  027057          .ASCII  " CWP/."
 1817  006362  132767  000002  172553          BITB    #CWF,RFLGS
 1818  006370  001002                          BNE     TCWPA
 1819  006372  004567  000726                  JSR     $,TYPENR
 1820  006376  004567  003664          TCWPA:  JSR     $,TYPEO
 1821  006402  001172                          SAVCWP
 1822
 1823  006404  004567  003564          TBD:    JSR     $,TYPEA
 1824  006410  041040  027524  020056          .ASCII  " BT/. "
 1825  006416  132767  000100  172517          BITB    #SF,RFLGS
 1826  006424  001412                          BEQ     TBDA
 1827  006426  132767  000200  172507          BITB    #DF,RFLGS
 1828  006434  001014                          BNE     TBDB
 1829  006436  004567  003532                  JSR     $,TYPEA
 1830  006442  041523  047101  020056          .ASCII  "SCAN. "
 1831  006450  000412                          BR      TDBC
 1832  006452  004567  003516          TBDA:   JSR     $,TYPEA
 1833  006456  044504  052123  020056          .ASCII  "DIST. "
 1834  006464  000404                          BR      TDBC
 1835  006466  004567  003502          TBDB:   JSR     $,TYPEA
 1836  006472  045104  027123                  .ASCII  "DJS."
 1837  006476  000240                  TDBC:   NOP
 1838
 1839  006500  004567  003470          TFLGS:  JSR     $,TYPEA
 1840  006504  043040  027057                  .ASCII  " F/."
```

```
 1841  006510  004567  003552                 JSR     $,TYPEO
 1842  006514  001142                         FLAGS
 1843
 1844
 1845
 1846  006516  004567  003452          TGWD:  JSR     $,TYPEA
 1847  006522  043536  042127  027057        .ASCII  " GWD/."
 1848  006530  132767  000004  172405        BITB    #WDF,RFLGS
 1849  006536  001002                         BNE     TGWDA
 1850  006540  004567  000560                 JSR     $,TYPENR
 1851  006544  004567  003516          TGWDA: JSR     $,TYPEO
 1852  006550  001216                         GWD
 1853
 1854  006552  004567  003416          TGMF:  JSR     $,TYPEA
 1855  006556  043440  043115  027057        .ASCII  " GMF/."
 1856  006564  132767  000010  172351        BITB    #MFF,RFLGS
 1857  006572  001002                         BNE     TGMFA
 1858  006574  004567  000524                 JSR     $,TYPENR
 1859  006600  004567  003462          TGMFA: JSR     $,TYPEO
 1860  006604  001214                         GMF
 1861
 1862  006606  004567  003362          TGWO:  JSR     $,TYPEA
 1863  006612  043440  030127  027057        .ASCII  " GWO/."
 1864  006620  132767  000020  172315        BITB    #WOF,RFLGS
 1865  006626  001002                         BNE     TGWOA
 1866  006630  004567  000470                 JSR     $,TYPENR
 1867  006634  004567  003426          TGWOA: JSR     $,TYPEO
 1868  006640  001220                         GWO
 1869
 1870  006642  004567  003326          TGW2:  JSR     $,TYPEA
 1871  006646  043440  031127  027057        .ASCII  " GW2/."
 1872  006654  132767  000040  172261        BITB    #W26F,RFLGS
 1873  006662  001002                         BNE     TGW2A
 1874  006664  004567  000434                 JSR     $,TYPENR
 1875  006670  004567  003372          TGW2A: JSR     $,TYPEO
 1876  006674  001222                         GW2
 1877
 1878  006676  004567  003272          TGW4:  JSR     $,TYPEA
 1879  006702  043440  032127  027057        .ASCII  " GW4/."
 1880  006710  132767  000040  172225        BITB    #W26F,RFLGS
 1881  006716  001002                         BNE     TGW4A
 1882  006720  004567  000400                 JSR     $,TYPENR
 1883  006724  004567  003336          TGW4A: JSR     $,TYPEO
 1884  006730  001224                         GW4
 1885
 1886  006732  004567  003236          TGW6:  JSR     $,TYPEA
 1887  006736  043440  033127  027057        .ASCII  " GW6/."
 1888  006744  132767  000040  172171        BITB    #W26F,RFLGS
 1889  006752  001002                         BNE     TGW6A
 1890  006754  004567  000344                 JSR     $,TYPENR
 1891  006760  004567  003302          TGW6A: JSR     $,TYPEO
 1892  006764  001226                         GW6
```

```
 1893  006766  004567  003202          TSWR:   JSR     $,TYPEA
 1894  006772  051440  051127  027057          .ASCII  " SWR/."
 1895  007000  004567  003262                  JSR     $,TYPEO
 1896  007004  001164                          SAVSWR
 1897  007006  004567  003162          TTWD:   JSR     $,TYPEA
 1898  007012  052136  042127  027057          .ASCII  " TWD/."
 1899  007020  132767  000004  172115          BITB    #WDF,RFLGS
 1900  007026  001002                          BNE     TTWDA
 1901  007030  004567  000270                  JSR     $,TYPENR
 1902  007034  004567  003226          TTWDA:  JSR     $,TYPEO
 1903  007040  001232                          TWD
 1904
 1905  007042  004567  003126          TTMF:   JSR     $,TYPEA
 1906  007046  052040  043115  027057          .ASCII  " TMF/."
 1907  007054  132767  000010  172061          BITB    #MFF,RFLGS
 1908  007062  001002                          BNE     TTMFA
 1909  007064  004567  000234                  JSR     $,TYPENR
 1910  007070  004567  003172          TTMFA:  JSR     $,TYPEO
 1911  007074  001230                          TMF
 1912
 1913  007076  004567  003072          TTWO:   JSR     $,TYPEA
 1914  007102  052040  030127  027057          .ASCII  " TWO/."
 1915  007110  132767  000020  172025          BITB    #WOF,RFLGS
 1916  007116  001002                          BNE     TTWOA
 1917  007120  004567  000200                  JSR     $,TYPENR
 1918  007124  004567  003136          TTWOA:  JSR     $,TYPEO
 1919  007130  001234                          TWO
 1920
 1921  007132  004567  003036          TTW2:   JSR     $,TYPEA
 1922  007136  052040  031127  027057          .ASCII  " TW2/."
 1923  007144  132767  000040  171771          BITB    #W26F,RFLGS
 1924  007152  001002                          BNE     TTW2A
 1925  007154  004567  000144                  JSR     $,TYPENR
 1926  007160  004567  003102          TTW2A:  JSR     $,TYPEO
 1927  007164  001236                          TW2
 1928
 1929  007166  004567  003002          TTW4:   JSR     $,TYPEA
 1930  007172  052040  032127  027057          .ASCII  " TW4/."
 1931  007200  132767  000040  171735          BITB    #W26F,RFLGS
 1932  007206  001002                          BNE     TTW4A
 1933  007210  004567  000110                  JSR     $,TYPENR
 1934  007214  004567  003046          TTW4A:  JSR     $,TYPEO
 1935  007220  001240                          TW4
 1936
 1937  007222  004567  002746          TTW6:   JSR     $,TYPEA
 1938  007226  052040  033127  027057          .ASCII  " TW6/."
 1939  007234  132767  000040  171701          BITB    #W26F,RFLGS
 1940  007242  001002                          BNE     TTW6A
 1941  007244  004567  000054                  JSR     $,TYPENR
 1942  007250  004567  003012          TTW6A:  JSR     $,TYPEO
 1943  007254  001242                          TW6
 1944
 1945  007256  004567  002712          TAXS:   JSR     $,TYPEA
 1946  007262  040440  051530  051127          .ASCII  " AXSWR/."
 1947  007270  027057
 1948  007272  032767  000140  171642          BIT     #BXF+JXF,FLAGS
```

```
CB11    MACY11 30A(1052)  03-MAR-78  09:20  PAGE 56
CZCBAC.P11    03-MAR-78 09:19                                          SEQ 0056

  1949  007300  001002                          BNE     TAXSA
  1950  007302  004567  000016                  JSR     $,TYPENR
  1951  007306  004567  002754          TAXSA:  JSR     $,TYPEO
  1952  007312  001210                          AXSWR
  1953
  1954  007314  004567  002654          TEX:    JSR     $,TYPEA
  1955  007320  027136                          .ASCII  '' .''
  1956  007322  000205                          RTS     $
```

```
 1957
 1958                                   ;SUBROUTINE TO TYPE "NR" (NOT RELEVANT).
 1959
 1960  007324  004567  002644          TYPENR: JSR     $,TYPEA
 1961  007330  051116  020056                  .ASCII  "NR. "
 1962  007334  062705  000006                  ADD     #6,$
 1963  007340  000205                          RTS     $
 1964
 1965
 1966
 1967                                   ;SUBROUTINE TO SAVE PERTINENT DATA AS IT WAS AT THE TIME OF THE ERROR CALL.
 1968
 1969  007342  016767  171574  171636  SAVE:   MOV     FLAGS,SAVFLG
 1970  007350  016667  000004  171602          MOV     +4(STP),SAVPC
 1971  007356  162767  000002  171574          SUB     #2,SAVPC
 1972  007364  016667  000006  171570          MOV     +6(STP),SAVPS
 1973  007372  016767  170172  171564          MOV     177570,SAVSWR
 1974  007400  010267  171562                  MOV     CADR,SAVCAD
 1975  007404  010367  171560                  MOV     CADRX,SAVCAX
 1976  007410  010467  171556                  MOV     CWP,SAVCWP
 1977  007414  016767  171532  171552          MOV     ITCNT,SAVITC
 1978  007422  016767  171650  171546          MOV     OKCTR,SAVOKC
 1979  007430  016767  171640  171626          MOV     ERCTR,SAVERC
 1980  007436  010067  171536                  MOV     R0,SAVR0
 1981  007442  010167  171534                  MOV     R1,SAVR1
 1982  007446  010667  171532                  MOV     STP,SAVSTP
 1983  007452  062767  000010  171524          ADD     #10,SAVSTP
 1984  007460  000205                          RTS     $
```

```
 1985
 1986                                   ;INITIALIZATION.
 1987
 1988  007462  012767  000010  171452  INIT:   MOV     #BF,FLAGS       ;INIT. FOR S&ORD DIAG.
 1989  007470  000407                    BR      INITA1
 1990  007472  012767  000004  171442  INITA5: MOV     #MOD,FLAGS      ;INIT. FOR MODULE TEST MODE.
 1991  007500  000403                    BR      INITA1
 1992  007502  012767  000020  171432  INITA:  MOV     #JF,FLAGS       ;INIT. FOR DJMRS DIAG.
 1993  007510  012767  177570  171420  INITA1: MOV     #177570,SWR
 1994  007516  000412                    BR      INITB
 1995  007520  012767  000040  171414  INITA2: MOV     #BXF,FLAGS      ;INIT. FOR BTEL ACCEPT/EXERCISE.
 1996  007526  000403                    BR      INITA4
 1997  007530  012767  000100  171404  INITA3: MOV     #JXF,FLAGS      ;INIT. FOR DJMPRS ACCEPT/EXERCISE.
 1998  007536  012767  001210  171372  INITA4: MOV     #AXSWR,SWR
 1999  007544  012706  001000          INITB:  MOV     #1000,STP
 2000  007550  005067  171374                  CLR     PASCTR
 2001  007554  012700  000002                  MOV     #2,R0           ;INIT. TRAP CATCHER SO THAT ANY
 2002  007560  005001                          CLR     R1              ;ILLEGAL TRAPS WILL HALT AT
 2003  007562  010021          INITB1: MOV     R0,(R1)+        ;THE LOCATION FOLLOWING THE
 2004  007564  005021                  CLR     (R1)+           ;LOCATION TO WHICH THE ILLEGAL
 2005  007566  062700  000004                  ADD     #4,R0           ;TRAP WAS MADE.
 2006  007572  020127  001000                  CMP     R1,#1000
 2007  007576  001371                          BNE     INITB1
 2008  007600  012767  000137  170372          MOV     #137,200
 2009  007606  012767  007462  170366          MOV     #INIT,202
 2010  007614  012767  005552  170172          MOV     #TTSVC,14       ;INIT. TRACE TRAP VECTOR.
 2011  007622  012767  005406  170170          MOV     #CTLSVC,20      ;INIT CONTROL TRAP VECTOR.
 2012  007630  012767  005554  170166          MOV     #PDOWN,24       ;INIT POWER FAIL TRAP VECTOR.
 2013  007636  012767  005660  170164          MOV     #ERRSVC,30      ;INIT. ERROR TRAP VECTOR.
 2014  007644  012767  005370  170162          MOV     #SCOSVC,34      ;INIT. SCOPE TRAP VECTOR.
 2015  007652  012700  001146                  MOV     #BEGV,R0        ;CLEAR ASSORTED VARIABLES.
 2016  007656  004767  002620                  JSR     %7,     TYPE    ;PRINT TITLE
 2017  007662  012542                          MSG
 2018  007664  005020          INITB2: CLR     (R0)+
 2019  007666  020027  001300                  CMP     R0,#ENDV
 2020  007672  001374                          BNE     INITB2
 2021  007674  005002                          CLR     R2
 2022  007676  005003                          CLR     R3
 2023  007700  005004                          CLR     R4
 2024  007702  012767  007722  170100          MOV     #INITC,10       ;DETERMINE THE TYPE OF PROCESSOR
 2025  007710  006700                          SXT     R0              ;(11/45) TYPES OR 11/20 TYPES) AND
 2026  007712  012767  000006  175632          MOV     #RTT,TTSVC      ;INIT. THE TRACE SERVICE ROUTINE
 2027  007720  000401                          BR      INITC1          ;ACCORDINGLY
 2028  007722  022626          INITC:  CMP     (STP)+,(STP)+
 2029  007724  012767  000012  170056  INITC1: MOV     #12,10
 2030  007732  012767  007762  170044          MOV     #INITD,4        ;INIT. TIMEOUT-ERROR TRAP VECTOR.
 2031  007740  005767  167602                  TST     KWLS            ;IS THERE A KW11L? (NO IF TRAP.)
 2032  007744  012767  177546  171316          MOV     #KWLS,KCSR      ;(YES IF NO TRAP.) - INIT CLOCK CSR.
 2033  007752  012767  010060  170120          MOV     #INITG,100      ;INIT. KW11L TRAP VECTOR.
 2034  007760  000421                          BR      INITF           ;BRANCH.
 2035  007762  012767  010020  170014  INITD:  MOV     #INITE,4        ;INIT. TIMEOUT-ERROR TRAP VECTOR.
 2036  007770  005767  162544                  TST     KWPS            ;IS THERE A KW11P? (NO IF TRAP.)
 2037  007774  012767  172540  171266          MOV     #KWPS,KCSR      ;(YES IF NO TRAP.) - INIT CLOCK CSR.
 2038  010002  012767  010060  170074          MOV     #INITG,104      ;INIT. KW11P TRAP VECTOR.
 2039  010010  012767  000001  162524          MOV     #1,KWPB         ;INIT. KW11P COUNT BUFFER.
 2040  010016  000402                          BR      INITF           ;BRANCH.
```

```
2041  010020  000000                    INITE:  HALT    ;***CATASTROPHIC ERROR. THERE IS NO CLOCK, AS REQUIRED.
2042  010022  000776                            BR      INITE
2043  010024  012767  000006  167752    INITF:  MOV     #6,4            ;INIT. (CLOSE OUT) TIMEOUT-ERROR TRAP VECTOR.
2044  010032  005067  171230                    CLR     DLACTR          ;INIT DELAY NUMBER.
2045  010036  012746  000000                    MOV     #0,     -(STP)  ;SET PROCESSOR PRIORITY TO 0
2046  010042  012746  010050                    MOV     #1$,    -(STP)
2047  010046  000002                            RTI
2048  010050  012777  000115  171212    1$:     MOV     #115,@KCSR      ;ENABLE INTERRUPT FROM CLOCK (EITHER ONE)
2049  010056  000001                            WAIT                    ;WAIT FOR FIRST INTERRUPT
2050  010060  022626                    INITG:  CMP     (STP)+,(STP)+   ;POP STACK.
2051  010062  005767  171200                    TST     DLACTR          ;FIRST INTERRUPT?
2052  010066  001010                            BNE     INITH           ;NO. - BRANCH.
2053  010070  012767  000002  171170            MOV     #2,DLACTR       ;YES. - ADJUST DELAY COUNTER.
2054  010076  005267  171164            INITG1: INC     DLACTR          ;COUNT UNTIL SECOND INTERRUPT.
2055  010102  001375                            BNE     INITG1
2056  010104  000000                    INITG2: HALT    ;***CATASTROPHIC ERROR.  COUNTER SHOULD NOT OVER RUN.
2057  010106  000776                            BR      INITG2
2058
2059  010110  005077  171154            INITH:  CLR     @KCSR           ;DISABLE CLOCK INTERRUPTS. (DLACTR=16.7MS)
2060  010114  012767  000102  167756            MOV     #102,100        ;INIT (CLOSE OUT) CLOCK VECTOR.
2061  010122  012767  000106  167754            MOV     #106,104        ;INIT (CLOSE OUT) CLOCK VECTOR.
2062  010130  005067  171120                    CLR     DLANO1          ;CALIBRATE FOR THIS PARTICULAR
2063  010134  162767  000021  171124    INITI:  SUB     #21,DLACTR      ;PROCESSOR 2 DELAY NUMBERS AND
2064  010142  005267  171106                    INC     DLANO1          ;DELAY OFFSETS OF 10% OF THE
2065  010146  022767  000021  171112            CMP     #21,DLACTR      ;DELAY NUMBERS.
2066  010154  101767                            BLOS    INITI
2067  010156  026727  171104  000011            CMP     DLACTR,#11
2068  010164  103402                            BLO     INITJ
2069  010166  005267  171062                    INC     DLANO1
2070  010172  016767  171056  171066    INITJ:  MOV     DLANO1,DLACTR   ;(DLANO1=1MS)
2071  010200  005067  171054                    CLR     DLAOF1
2072  010204  005067  171052                    CLR     DLAOF2
2073  010210  005067  171040                    CLR     DLANO1
2074  010214  005067  171036                    CLR     DLANO2
2075  010220  066767  171042  171026    INITJ1: ADD     DLACTR,DLANO1
2076  010226  005267  171026                    INC     DLAOF1
2077  010232  026767  171022  170652            CMP     DLAOF1,DMS1
2078  010240  001367                            BNE     INITJ1
2079  010242  066767  171020  171006    INITJ2: ADD     DLACTR,DLANO2   ;(DLANO1=1MSXDMS1)
2080  010250  005267  171006                    INC     DLAOF2
2081  010254  026767  171002  170632            CMP     DLAOF2,DMS2
2082  010262  001367                            BNE     INITJ2
2083  010264  005067  170770            INITK:  CLR     DLAOF1          ;(DLANO2=1MSXDMS2)
2084  010270  005067  170766                    CLR     DLAOF2
2085  010274  016767  170754  170764            MOV     DLANO1,DLACTR
2086  010302  162767  000012  170756    INITK1: SUB     #12,DLACTR
2087  010310  005267  170744                    INC     DLAOF1
2088  010314  022767  000012  170744            CMP     #12,DLACTR
2089  010322  101767                            BLOS    INITK1
2090  010324  026727  170736  000007            CMP     DLACTR,#7
2091  010332  103402                            BLO     INITK2
2092  010334  005267  170720                    INC     DLAOF1
2093  010340  016767  170712  170720    INITK2: MOV     DLANO2,DLACTR   ;(DLAOF1=10% DLANO1)
2094  010346  162767  000012  170712    INITK3: SUB     #12,DLACTR
2095  010354  005267  170702                    INC     DLAOF2
2096  010360  022767  000012  170700            CMP     #12,DLACTR
```

```
 2097  010366  101767                          BLOS    INITK3
 2098  010370  026727  170672  000007          CMP     DLACTR,#7
 2099  010376  103402                          BLO     INITK4
 2100  010400  005267  170656                  INC     DLAOF2
 2101  010404  000240                  INITK4: NOP                     ;(DLAOF2=10% DLANO2)
 2102  010406  000240                          NOP
 2103  010410  032767  000004  170524          BIT     #MOD,FLAGS
 2104  010416  001416                          BEQ     INITL
 2105  010420  004567  001550                  JSR     $,TYPEA
 2106  010424  020136  051536  047440          .ASCII  "   S OR D MODULE TEST."
 2107  010432  020122  020104  047515
 2108  010440  052504  042514  052040
 2109  010446  051505  027124
 2110  010452  000425                          BR      INITM
 2111  010454  032767  000050  170460  INITL:  BIT     #BF+BXF,FLAGS
 2112  010462  001411                          BEQ     INITL1
 2113  010464  004567  001504                  JSR     $,TYPEA
 2114  010470  020136  051536  023040          .ASCII  "   S &/OR D."
 2115  010476  047457  020122  027104
 2116  010504  000410                          BR      INITM
 2117  010506  004567  001462          INITL1: JSR     $,TYPEA
 2118  010512  020136  042136  045040          .ASCII  "   D JMPR S."
 2119  010520  050115  020122  027123
 2120  010526  032767  000034  170406  INITM:  BIT     #BF+JF+MOD,FLAGS
 2121  010534  001407                          BEQ     INITM1
 2122  010536  004567  001432                  JSR     $,TYPEA
 2123  010542  042040  040511  057107          .ASCII  " DIAG . "
 2124  010550  020056
 2125  010552  000413                          BR      INITN
 2126  010554  004567  001414          INITM1: JSR     $,TYPEA
 2127  010560  040440  041503  050105          .ASCII  " ACCEPT/EXERCISE ."
 2128  010566  027524  054105  051105
 2129  010574  044503  042523  027136
 2130
 2131  010602  005767  170310          INITN:  TST     LOSA            ;HAVE TTY QUERIES EVER BEEN MADE?
 2132  010606  001404                          BEQ     INITO           ;NO. - BRANCH.
 2133  010610  032767  000010  166752          BIT     #IQS,177570     ;YES. - INHIBIT SUBSEQUENT TTY QUERIES?
 2134  010616  001002                          BNE     INITP           ;YES. - BRANCH.
 2135  010620  004567  000026          INITO:  JSR     $,QBEG          ;NO. - MAKE TTY QUERIES.
 2136  010624  056767  170314  170310  INITP:  BIS     FX,FLAGS        ;CARRY FLAGS FROM PREVIOUS PASS (IF ANY).
 2137  010632  032767  000140  170302          BIT     #BXF+JXF,FLAGS  ;ACCEPT/EXERCISE?
 2138  010640  001002                          BNE     INITR           ;YES. - BRANCH
 2139  010642  000167  171232          INITQ:  JMP     PREST           ;NO. - BRANCH. (DIAG.)
 2140  010646  000167  174212          INITR:  JMP     AXCTL           ;BRANCH.
 2141
```

```
2142
2143                                    ;SUBROUTINE TO MAKE INITIAL TTY INQUIRIES.
2144
2145  010652  000240                    QBEG:   NOP
2146  010654  004567  001314            QLOSA:  JSR     $,TYPEA
2147  010660  046136  051517  037501            .ASCII  " LOSA? ."
2148  010666  027040
2149  010670  004567  001032            QLOSAA: JSR     $,KADRS
2150  010674  010067  170216                    MOV     R0,LOSA
2151  010700  010067  170214                    MOV     R0,HISA
2152  010704  020027  000116                    CMP     R0,#'N
2153  010710  001432                            BEQ     QLODA
2154  010712  032700  000007                    BIT     #7,R0
2155  010716  001142                            BNE     QERA
2156
2157  010720  004567  001250            QHISA:  JSR     $,TYPEA
2158  010724  044136  051511  037501            .ASCII  " HISA? ."
2159  010732  027040
2160  010734  004567  000766            QHISAA: JSR     $,KADRS
2161  010740  010067  170154                    MOV     R0,HISA
2162  010744  020027  000116                    CMP     R0,#'N
2163  010750  001525                            BEQ     QERA
2164  010752  010067  170152                    MOV     R0,HISAX
2165  010756  042767  000007  170144            BIC     #7,HISAX
2166  010764  042700  177770                    BIC     #177770,R0
2167  010770  020027  000006                    CMP     R0,#6
2168  010774  001113                            BNE     QERA
2169
2170  010776  004567  001172            QLODA:  JSR     $,TYPEA
2171  011002  046136  042117  037501            .ASCII  " LODA? ."
2172  011010  027040
2173  011012  004567  000710            QLODAA: JSR     $,KADRS
2174  011016  010067  170100                    MOV     R0,LODA
2175  011022  010067  170076                    MOV     R0,HIDA
2176  011026  020027  000116                    CMP     R0,#'N
2177  011032  001426                            BEQ     QADCK
2178  011034  032700  000007                    BIT     #7,R0
2179  011040  001071                            BNE     QERA
2180
2181  011042  004567  001126            QHIDA:  JSR     $,TYPEA
2182  011046  044136  042111  037501            .ASCII  " HIDA? ."
2183  011054  027040
2184  011056  004567  000644            QHIDAA: JSR     $,KADRS
2185  011062  010067  170036                    MOV     R0,HIDA
2186  011066  020027  000116                    CMP     R0,#'N
2187  011072  001454                            BEQ     QERA
2188  011074  042700  177770                    BIC     #177770,R0
2189  011100  001451                            BEQ     QERA
2190  011102  020027  000004                    CMP     R0,#4
2191  011106  001446                            BEQ     QERA
2192
2193  011110  026727  170002  000116    QADCK:  CMP     LOSA,#'N
2194  011116  001004                            BNE     QADCKA
2195  011120  026727  167776  000116            CMP     LODA,#'N
2196  011126  001545                            BEQ     QERD
2197  011130  026767  167762  167762    QADCKA: CMP     LOSA,HISA
```

```
2198  011136  101115                          BHI     QERC
2199  011140  026767  167756  167756          CMP     LODA,HIDA
2200  011146  101111                          BHI     QERC
2201  011150  016701  167742                  MOV     LOSA,R1
2202  011154  020167  167742          QADCKB: CMP     R1,LODA
2203  011160  001461                          BEQ     QERB
2204  011162  020167  167732                  CMP     R1,HISA
2205  011166  001403                          BEQ     QADCKC
2206  011170  062701  000002                  ADD     #2,R1
2207  011174  000767                          BR      QADCKB
2208  011176  016701  167720          QADCKC: MOV     LODA,R1
2209  011202  020167  167710          QADCKD: CMP     R1,LOSA
2210  011206  001446                          BEQ     QERB
2211  011210  020167  167710                  CMP     R1,HIDA
2212  011214  001531                          BEQ     QDATA
2213  011216  062701  000002                  ADD     #2,R1
2214  011222  000767                          BR      QADCKD
2215
2216  011224  016767  170016  170016  QERA:   MOV     TYPSRC,QSRC
2217  011232  004567  000736                  JSR     $,TYPEA
2218  011236  037477  044136  051511          .ASCII  "?? HISA=XXXXX6 ONLY, HIDA=XXXXX2 OR XXXXX6 ONLY . "
2219  011244  036501  054130  054130
2220  011252  033130  047440  046116
2221  011260  026131  044040  042111
2222  011266  036501  054130  054130
2223  011274  031130  047440  020122
2224  011302  054130  054130  033130
2225  011310  047440  046116  057131
2226  011316  020056
2227  011320  000177  167724                  JMP     @QSRC
2228
2229  011324  004567  000644          QERB:   JSR     $,TYPEA
2230  011330  037477  051536  046501          .ASCII  "?? SAME SCAN & DIST ADDRESS? ."
2231  011336  020105  041523  047101
2232  011344  023040  042040  051511
2233  011352  020124  042101  051104
2234  011360  051505  037523  027136
2235  011366  000167  177260                  JMP     QBEG
2236
2237  011372  004567  000576          QERC:   JSR     $,TYPEA
2238  011376  046136  020117  042101          .ASCII  " LO ADRS HIGHER THAN HI ADRS? . "
2239  011404  051522  044040  043511
2240  011412  042510  020122  044124
2241  011420  047101  044040  020111
2242  011426  042101  051522  057077
2243  011434  020056
2244  011436  000167  177210                  JMP     QBEG
2245
2246
2247  011442  004567  000526          QERD:   JSR     $,TYPEA
2248  011446  047136  020117  047502          .ASCII  " NO BOARDS, NO TEST . "
2249  011454  051101  051504  020054
2250  011462  047516  052040  051505
2251  011470  057124  020056
2252  011474  000167  177152                  JMP     QBEG
2253
```

```
2254  011500  032767  000120  167434  QDATA:  BIT     #JF+JXF,FLAGS
2255  011506  001447                  BEQ     QDCON
2256  011510  004567  000460          JSR     $,TYPEA
2257  011514  042136  052101  037501  .ASCII  '' DATA? .''
2258  011522  027040
2259  011524  004567  000202          JSR     $,KDATA
2260  011530  010067  167404          MOV     R0,DATAWD
2261  011534  042767  000200  167402  BIC     #DATF,FX
2262  011542  022767  000006  167502  CMP     #6,KCTR
2263  011550  001403                  BEQ     QJMPD
2264  011552  052767  000200  167364  BIS     #DATF,FX
2265
2266  011560  004567  000410          QJMPD:  JSR     $,TYPEA
2267  011564  042136  051511  051524  .ASCII  '' DISTS JUMPED TO SCAN? .''
2268  011572  045040  046525  042520
2269  011600  020104  047524  051440
2270  011606  040503  037516  027040
2271  011614  004567  000116          JSR     $,KYORN
2272  011620  020027  000116          CMP     R0,#'N
2273  011624  001755                  BEQ     QJMPD
2274
2275  011626  004567  000342          QDCON:  JSR     $,TYPEA
2276  011632  052536  042523  020122  .ASCII  '' USER DISCONNECTED? . ''
2277  011640  044504  041523  047117
2278  011646  042516  052103  042105
2279  011654  020077  020056
2280  011660  004567  000052          JSR     $,KYORN
2281  011664  020027  000116          CMP     R0,#'N
2282  011670  001756                  BEQ     QDCON
2283
2284  011672  004567  000276          QTSTNG: JSR     $,TYPEA
2285  011676  052136  040510  045516  .ASCII  '' THANKS! NOW TESTING .''
2286  011704  020523  047040  053517
2287  011712  052040  051505  044524
2288  011720  043516  027136
2289
2290
2291  011724  000205                  QEND:   RTS     $
```

```
2292
2293
2294
2295
2296                                    ;SUBROUTINES TO KEY IN CORRECT OPERATOR REPLIES TO TTY QUERIES.
2297
2298  011726  004567  000010          KADRS:  JSR     $,KIN           ;ENTRY TO KEY IN AN ADDRESS.
2299  011732  004567  000004          KDATA:  JSR     $,KIN           ;ENTRY TO KEY IN DATA.
2300  011736  004567  000000          KYORN:  JSR     $,KIN           ;ENTRY TO KEY IN A Y OR AN N.
2301  011742  005001                  KIN:    CLR     R1              ;INIT. & PREPARE TO INPUT A
2302  011744  012767  000006  167300          MOV     #6,KCTR         ;MAXIMUM OF SIX CHARACTERS.
2303  011752  005267  165602          KINA:   INC     TKS             ;ENABLE CHAR. READ.
2304  011756  105767  165576          KINB:   TSTB    TKS             ;CHAR. READY?
2305  011762  100375                          BPL     KINB            ;NO. - BRANCH.
2306  011764  116700  165572                  MOVB    TKB,R0          ;YES. - READ CHAR.
2307  011770  042700  177600                  BIC     #177600,R0      ;CONVERT CHAR. FROM 8 TO 7 BIT ASCII.
2308  011774  105767  165564          KINB1:  TSTB    TPS             ;ECHO THE CHAR.
2309  012000  100375                          BPL     KINB1
2310  012002  010067  165560                  MOV     R0,TPB
2311  012006  020527  011742                  CMP     $,#KIN          ;WAS REPLY TO BE Y OR N ONLY?
2312  012012  001436                          BEQ     KINC            ;YES. - BRANCH
2313  012014  020027  000060                  CMP     R0,#'0          ;NO. - CHAR. LESS THAN A CHAR. 0?
2314  012020  103452                          BLO     KINE            ;YES. - BRANCH.
2315  012022  020027  000067                  CMP     R0,#'7          ;NO. - CHAR. GREATER THAN A CHAR. 7?
2316  012026  101030                          BHI     KINC            ;YES. - BRANCH.
2317  012030  042700  177770                  BIC     #177770,R0      ;NO. - CONVERT ASCII TO OCTAL.
2318  012034  050001                          BIS     R0,R1           ;TRANSFER CHAR. TO R1.
2319  012036  005367  167210                  DEC     KCTR            ;WAS THIS THE SIXTH CHARACTER?
2320  012042  001404                          BEQ     KINB2           ;YES. - BRANCH.
2321  012044  006301                          ASL     R1              ;NO. - POSITION CHARS.
2322  012046  006301                          ASL     R1              ;POSITION CHARS.
2323  012050  006301                          ASL     R1              ;POSITION CHARS.
2324  012052  000737                          BR      KINA            ;BRANCH.
2325  012054  010100                  KINB2:  MOV     R1,R0           ;YES. - TRANSFER THE SIX CHARS. TO R0.
2326  012056  020527  011732                  CMP     $,#KDATA        ;SHOULD THIS REPLY BE AN ADDRESS?
2327  012062  001027                          BNE     KIND            ;NO. - BRANCH
2328  012064  032700  000001                  BIT     #1,R0           ;YES. - IS ADRS. EVEN?
2329  012070  001026                          BNE     KINE            ;NO. - BRANCH.
2330  012072  020027  164000                  CMP     R0,#164000      ;YES. - IS ADRS. LESS THAN 164000?
2331  012076  103423                          BLO     KINE            ;YES. - BRANCH.
2332  012100  020027  167776                  CMP     R0,#167776      ;NO. - IS ADRS. GREATER THAN 167776?
2333  012104  101020                          BHI     KINE            ;YES. - BRANCH.
2334  012106  000415                          BR      KIND            ;NO. - BRANCH.
2335  012110  022767  000006  167134  KINC:   CMP     #6,KCTR         ;IS THIS THE FIRST CHAR?
2336  012116  001013                          BNE     KINE            ;NO. - BRANCH.
2337  012120  020027  000116                  CMP     R0,#'N          ;YES. - IS CHAR. AN N?
2338  012124  001406                          BEQ     KIND            ;YES. - BRANCH.
2339  012126  020527  011742                  CMP     $,#KIN          ;NO. - WAS REPLY TO BE AN ADRS. OR DATA?
2340  012132  001005                          BNE     KINE            ;YES. - BRANCH.
2341  012134  020027  000131                  CMP     R0,#'Y          ;NO - IS CHAR. A Y?
2342  012140  001002                          BNE     KINE            ;NO. - BRANCH.
2343  012142  012605                  KIND:   MOV     (STP)+,$        ;YES. - POP STACK ONE JSR.
2344  012144  000205                          RTS     $               ;RETURN. - REPLY IS IN R0.
2345  012146  016767  167074  167074  KINE:   MOV     TYPSRC,QSRC     ;GET ANOTHER TRY AT IT.
2346  012154  004567  000014                  JSR     $,TYPEA
2347  012160  037477  020056                  .ASCII  "??. "
```

```
  2348  012164  005726                    TST     (STP)+          ;POP STACK TWO JSR'S.
  2349  012166  012605                    MOV     (STP)+,$
  2350  012170  000177  167054            JMP     @QSRC           ;RETURN TO RE-QUERY
```

```
2351
2352
2353                                    ;SUBROUTINE TO TYPE ASCII CODE.
2354
2355  012174  010567  167046            TYPEA:  MOV     $,TYPSRC
2356  012200  162767  000004  167040            SUB     #4,TYPSRC
2357  012206  105767  165352            TYPEAA: TSTB    TPS
2358  012212  100375                            BPL     TYPEAA
2359  012214  121527  000136                    CMPB    ($),#136
2360  012220  001005                            BNE     TYPEAB
2361  012222  105725                            TSTB    ($)+
2362  012224  004567  177756                    JSR     $,TYPEAA
2363  012230  005015                            005015
2364  012232  000056                            000056
2365  012234  121527  000056            TYPEAB: CMPB    ($),#56
2366  012240  001403                            BEQ     TYPEAC
2367  012242  112567  165320                    MOVB    ($)+,TPB
2368  012246  000757                            BR      TYPEAA
2369  012250  105725                    TYPEAC: TSTB    ($)+
2370  012252  032705  000001                    BIT     #1,$
2371  012256  001401                            BEQ     TYPEAD
2372  012260  005205                            INC     $
2373  012262  000240                    TYPEAD:         NOP
2374  012264  000205                            RTS     $
2375
2376
2377
2378                                    ;SUBROUTINE TO TYPE A SIX DIGIT OCTAL NUMBER.
2379
2380  012266  005067  000056            TYPEO:  CLR     TYPEOC
2381  012272  012500                            MOV     ($)+,R0
2382  012274  011000                            MOV     (R0),R0
2383  012276  006300                            ASL     R0
2384  012300  006167  000044                    ROL     TYPEOC
2385  012304  005200                            INC     R0
2386  012306  000413                            BR      TYPEOB
2387  012310  005067  000034            TYPEOA: CLR     TYPEOC
2388  012314  006300                            ASL     R0
2389  012316  006167  000026                    ROL     TYPEOC
2390  012322  006300                            ASL     R0
2391  012324  006167  000020                    ROL     TYPEOC
2392  012330  006300                            ASL     R0
2393  012332  006167  000012                    ROL     TYPEOC
2394  012336  052767  027060  000004    TYPEOB: BIS     #27060,TYPEOC
2395  012344  004567  177624                    JSR     $,TYPEA
2396  012350  027060                    TYPEOC: .ASCII  "0."
2397  012352  020027  100000                    CMP     R0,#100000
2398  012356  001354                            BNE     TYPEOA
2399  012360  000205                            RTS     $
```

```
 2400
 2401
 2402  012362  032767  000034  166552  PEND:   BIT     #BF+JF+MOD,FLAGS
 2403  012370  001002                  BNE     PASEND
 2404  012372  000177  166614          JMP     @AXRTN
 2405
 2406  012376  005267  166546  PASEND: INC     PASCTR
 2407  012402  004567  177566          JSR     $,TYPEA
 2408  012406  027007                  27007
 2409  012410  032767  000040  165152  BIT     #PCS,177570
 2410  012416  001426                  BEQ     PEA
 2411  012420  004567  177550          JSR     $,TYPEA
 2412  012424  027136                  .ASCII  " ."
 2413  012426  004567  177634          JSR     $,TYPEO
 2414  012432  001150                  PASCTR
 2415  012434  004567  177534          JSR     $,TYPEA
 2416  012440  051040  047111  054507  .ASCII  " RINGY DINGY. "
 2417  012446  042040  047111  054507
 2418  012454  020056
 2419  012456  022767  000001  166464  CMP     #1,PASCTR
 2420  012464  001403                  BEQ     PEA
 2421  012466  004567  177502          JSR     $,TYPEA
 2422  012472  027123                  .ASCII  "S."
 2423  012474  000240          PEA:    NOP
 2424
 2425  012476  000167  176122  LOGICAL:        JMP     INITP
 2426                          ;ROUTINE TO OUTPUT TITLE
 2427
 2428  012502  011601          TYPE:   MOV     (%6),   %1
 2429  012504  011101                  MOV     (%1),   %1
 2430  012506  062716  000002          ADD     #2,     (%6)
 2431  012512  112167  000022  LOOP:   MOVB    (%1)+,  CHAR
 2432  012516  001001                  BNE     1$
 2433  012520  000207                  RTS     %7
 2434  012522  105737  177564  1$:     TSTB    @#177564
 2435  012526  100375                  BPL     1$
 2436  012530  116737  000004  177566  MOVB    CHAR,   @#177566
 2437  012536  000765                  BR      LOOP
 2438  012540  000000          CHAR:   0
 2439  012542  006412  055103  041103  MSG:    .ASCIZ<12><15>/CZCBAC CB11 LOGIC TEST/<12><15>
 2440  012550  041501  041440  030502
 2441  012556  020061  047514  044507
 2442  012564  020103  042524  052123
 2443  012572  006412     000
 2444          000001                  .END
```

```
ALRF   = 000377            754#
AXCA     005104           1588    1592#
AXCB     005124           1592    1596#
AXCC     005144           1596    1600#
AXCD     005164           1600    1604#
AXCE     005204           1604    1608#
AXCF     005224           1608    1612#
AXCG     005244           1612    1616#
AXCH     005264           1616    1620#
AXCI     005304           1620    1624#
AXCJ     005324           1624    1628#
AXCK     005344           1628    1632#
AXCL     005364           1632    1636#
AXCTL    005064           1588#   2140
AXF    = 000001            743#   1809
AXRTN    001212            852#   1588*  1592*  1596*  1600*  1604*  1608*  1612*  1616*  1620*  1624*  1628*  1632*
                          2404
AXSWR    001210            851#   1589*  1593*  1597*  1601*  1605*  1609*  1613*  1617*  1621*  1625*  1629*  1633*
                          1952   1998
BEGV     001146            834#   2015
BF     = 000010            738#   1988   2111   2120   2402
BXF    = 000040            740#   1948   1995   2111   2137
CHAR     012540           2431*   2436   2438#
CONTRO= 104777             719#   1094   1115   1136   1170   1204   1237   1271   1303   1337   1372   1397   1417
                          1437   1456   1476   1497   1518   1571
CSVCA1   005436           1656    1658#
CTLSVC   005406           1643    1652#  2011
CTSVCA   005422           1653    1655#  1755   1780
CTSVCB   005452           1661#   1667
CTSVCC   005460           1660    1663#
CTSVCD   005504           1664    1668#
CWF    = 000002            744#   1817
DATAWD   001140            828#   1558   2260*
DATF   = 000200            742#   1068   1556   1573   2261   2264
DCE67    001660           1014#
DCW00    001502            959#   1410   1449   1489   1511   1555
DCW01    001504            960#
DCW02    001506            961#
DCW03    001510            962#
DCW04    001512            963#
DCW05    001514            964#
DCW06    001516            965#
DCW07    001520            966#
DCW10    001522            967#
DCW11    001524            968#
DCW12    001526            969#
DCW13    001530            970#
DCW14    001532            971#
DCW15    001534            972#
DCW16    001536            973#
DCW17    001540            974#
DCW20    001542            975#
DCW21    001544            976#
DCW22    001546            977#
DCW23    001550            978#
DCW24    001552            979#
```

```
DCW25   001554            980#
DCW26   001556            981#
DCW27   001560            982#
DCW30   001562            983#
DCW31   001564            984#
DCW32   001566            985#
DCW33   001570            986#
DCW34   001572            987#
DCW35   001574            988#
DCW36   001576            989#
DCW37   001600            990#
DCW40   001602            991#
DCW41   001604            992#
DCW42   001606            993#
DCW43   001610            994#
DCW44   001612            995#
DCW45   001614            996#
DCW46   001616            997#
DCW47   001620            998#
DCW50   001622            999#
DCW51   001624           1000#
DCW52   001626           1001#
DCW53   001630           1002#
DCW54   001632           1003#
DCW55   001634           1004#
DCW56   001636           1005#
DCW57   001640           1006#
DCW60   001642           1007#
DCW61   001644           1008#
DCW62   001646           1009#
DCW63   001650           1010#
DCW64   001652           1011#
DCW65   001654           1012#
DCW66   001656           1013#
DCW70   001662           1015#
DCW71   001664           1016#
DCW72   001666           1017#
DCW73   001670           1018#
DCW74   001672           1019#
DCW75   001674           1020#
DCW76   001676           1021#
DCW77   001700           1022#   1429    1468    1520    1575
DELAY   002034           1048    1053#
DELAY1  002010           1046#   1155    1189    1222    1256    1288    1322
DELAY2  002024           1050#   1564
DF    = 000200            750#   1365    1391    1827
DJMPRS  001000            770#
DJSAX   001020            787#
DJS1A   004746           1557    1559#
DJS1B   005040           1574    1577#
DJS1BG  004710           1544    1552#
DJS1ER  005020           1567    1570    1572#
DJS1L1  004750           1560#   1576
DJS1L2  004726           1555#   1581
DJS1ND  005060           1578    1582#
DJS1OK  005016           1571#
```

```
DLAA     002054            1055    1057#
DLAB     002070            1058    1060#   1061
DLACTR   001266             874#   1053*   1056*   1059*   1060*   2044*   2051    2053*   2054*   2063*   2065    2067    2070*
                           2075    2079    2085*   2086*   2088    2090    2093*   2094*   2096    2098
DLANO1   001254             869#   1046    2062*   2064*   2069*   2070    2073*   2075*   2085
DLANO2   001256             870#   1050    2074*   2079*   2093
DLAOF1   001260             871#   1047    2071*   2076*   2077    2083*   2087*   2092*
DLAOF2   001262             872#   1051    2072*   2080*   2081    2084*   2095*   2100*
DMS1     001112             815#   2077
DMS2     001114             816#   2081
DRF    = 000206             752#   1412    1431    1451    1470    1491    1510
DSRF   = 000327             753#   1552
DTMADV   004034            1368    1376#
DTMBEG   003760            1353    1362#
DTMEND   004042            1375    1378#
DTMERR   004024            1370    1373#
DTMLOP   004006            1367#   1377
DTMOK    004022            1372#
DTMTS    004020            1364    1371#
DTOBEG   004054            1354    1379    1389#
DTOEND   004126            1400    1403#
DTOERR   004110            1396    1398#
DTOLOP   004076            1393#   1402
DTOOK    004106            1394    1397#
DTOTS    004102            1390    1395#
DT1BEG   004140            1404    1409#
DT1END   004214            1420    1423#
DT1ERR   004176            1416    1418#
DT1LOP   004164            1414#   1422
DT1OK    004174            1417#
DT2BEG   004220            1423    1428#
DT2END   004302            1440    1443#
DT2ERR   004264            1436    1438#
DT2LOP   004244            1433#   1442
DT2OK    004262            1437#
DT3BEG   004306            1443    1448#
DT3END   004362            1459    1462#
DT3ERR   004344            1455    1457#
DT3LOP   004332            1453#   1461
DT3OK    004342            1456#
DT4BEG   004366            1462    1467#
DT4END   004450            1479    1482#
DT4ERR   004432            1475    1477#
DT4LOP   004412            1472#   1481
DT4OK    004430            1476#
DT5BEG   004454            1482    1488#
DT5END   004536            1500    1503#
DT5ERR   004520            1496    1498#
DT5LOP   004500            1493#   1502
DT5OK    004516            1497#
DT6BEG   004542            1503    1509#
DT6END   004632            1523    1526#
DT6ERR   004606            1517    1519#
DT6L1    004560            1512#   1521
DT6L2    004554            1511#   1525
DT6OK    004604            1518#
```

```
ECF    = 000001   735#  1652  1726  1740  1743
ENDV     001300   879#  2019
ERCTR    001274   877#  1764* 1775  1979
ERROR  = 104000   718#  1095  1116  1137  1171  1205  1238  1272  1304  1338  1373  1398  1418
                 1438  1457  1477  1498  1519  1572
ERRSVC   005660  1726#  2013
ERSVCA   005714  1733#  1742
ERSVCB   005726  1734   1736#
ERSVCC   005736  1738#
ERSVCD   005744  1727   1740#
ERSVCE   005752  1732   1741#
ERSVCG   005760  1737   1743#
ESVCA1   005704  1729   1731#  1784
FESAV    001272   802*   809    876#
FLAGS    001142   713    829#  1066  1068  1074  1352  1530  1556  1573  1652  1726  1728  1740*
                 1743*  1748  1750*  1842  1948  1969  1988*  1990*  1992*  1995*  1997*  2103  2111
                 2120   2136* 2137   2254  2402
FORCEA   001104   810#   811
FORCER   001040   802#
FX       001144   830#  2136  2261* 2264*
GMF      001214   853#  1026* 1028  1032  1036  1040  1160  1194  1227  1261  1293  1327  1860
GWD      001216   854#  1411* 1430* 1435  1450* 1469* 1474  1490* 1495  1512* 1516  1560* 1566
                 1852
GWO      001220   855#  1027* 1030* 1162  1196  1229  1263  1295  1329  1561* 1568  1868
GW2      001222   856#  1031* 1034* 1164  1198  1231  1265  1297  1331  1876
GW4      001224   857#  1035* 1038* 1166  1200  1233  1267  1299  1333  1884
GW6      001226   858#  1039* 1042* 1168  1202  1235  1269  1301  1335  1892
HES    = 100000   721#  1733
HIDA     001124   822#  1399  1419  1439  1458  1478  1499  1522  1577  2175* 2185* 2199  2211
HIDAX    001134   826#
HISA     001120   820#  1117  2151* 2161* 2197  2204
HISAX    001130   824#  1138  1172  1206  1239  1273  1305  1341  1540  2164* 2165*
IDJ      004652  1070   1531  1536#
IDJA     004664  1539#  1543
IDJB     004704  1541   1544#
IMCNT    001156   838#
IMCTL    005770  1654   1730  1748#
IMCTLA   006032  1749   1755#
IMCTLB   006074  1756   1764#
IMCTLC   006126  1758   1763  1765  1770#
IMCTLD   006176  1771   1780#
IMCTLE   006206  1781   1783#
IMF    = 000002   736#  1728  1743  1748  1750
IMS    = 000100   727#  1770
INIT     007462   762   1988#  2009
INITA    007502   770   1992#
INITA1   007510  1989   1991  1993#
INITA2   007520   778   1995#
INITA3   007530   787   1997#
INITA4   007536  1996   1998#
INITA5   007472   794   1990#
INITB    007544  1994   1999#
INITB1   007562  2003#  2007
INITB2   007664  2018#  2020
INITC    007722  2024   2028#
INITC1   007724  2027   2029#
```

```
INITD   007762           2030    2035#
INITE   010020           2035    2041#   2042
INITF   010024           2034    2040    2043#
INITG   010060           2033    2038    2050#
INITG1  010076           2054#   2055
INITG2  010104           2056#   2057
INITH   010110           2052    2059#
INITI   010134           2063#   2066
INITJ   010172           2068    2070#
INITJ1  010220           2075#   2078
INITJ2  010242           2079#   2082
INITK   010264           2083#
INITK1  010302           2086#   2089
INITK2  010340           2091    2093#
INITK3  010346           2094#   2097
INITK4  010404           2099    2101#
INITL   010454           2104    2111#
INITL1  010506           2112    2117#
INITM   010526           2110    2116    2120#
INITM1  010554           2121    2126#
INITN   010602           2125    2131#
INITO   010620           2132    2135#
INITP   010624           1720    2134    2136#   2425
INITQ   010642           2139#
INITR   010646           2138    2140#
IQS   = 000010            730#   2133
ITCNT   001152            836#   1665*   1666    1668*   1977
ITNO    001110            814#   1666
ITS   = 004000            725#   1589    1593    1597    1613    1617    1621    1663
IZGSW   001702           1026#   1150    1184    1217    1250    1283    1319
IZGSWA  001726           1029    1031#
IZGSWB  001746           1033    1035#
IZGSWC  001766           1037    1039#
IZGSWD  002006           1041    1043#
JF    = 000020            739#   1066    1530    1992    2120    2254    2402
JXF   = 000100            741#   1066    1530    1948    1997    2137    2254
KADRS   011726           2149    2160    2173    2184    2298#
KCSR    001270            875#   2032*   2037*   2048*   2059*
KCTR    001252            868#   2262    2302*   2319*   2335
KDATA   011732           2259    2299#   2326
KIN     011742           2298    2299    2300    2301#   2311    2339
KINA    011752           2303#   2324
KINB    011756           2304#   2305
KINB1   011774           2308#   2309
KINB2   012054           2320    2325#
KINC    012110           2312    2316    2335#
KIND    012142           2327    2334    2338    2343#
KINE    012146           2314    2329    2331    2333    2336    2340    2342    2345#
KWLS  = 177546            708#   2031    2032
KWPB  = 172542            710#   2039*
KWPC  = 172544            711#
KWPS  = 172540            709#   2036    2037
KYORN   011736           2271    2280    2300#
LDS   = 000002            732#   1057    1593    1605    1617    1629
LODA    001122            821#   1349    1362    1367    1389    1409    1428    1448    1467    1488    1509    1553    2174*
                         2195    2199    2202    2208
```

```
LODAX   001132            825#
LOGICA  012476           2425#
LOOP    012512           2431#  2437
LOSA    001116            819#  1071   1084   1089   1107   1128   1148   1182   1215   1248   1281   1315   1537
                         1554   2131   2150*  2193   2197   2201   2209
LOSAX   001126            823#
MFF   = 000010            746#  1856   1907
MOD   = 000004            737#  1074   1352   1990   2103   2120   2402
MODMOD  001030            794#
MSG     012542           2017   2439#
NOP   = 000240            715#
OKCTR   001276            878#  1757*  1779   1978
PASCTR  001150            835#  2000*  2406*  2414   2419
PASEND  012376           1636   2403   2406#
PCS   = 000040            728#  2409
PDOWN   005554           1694#  1718   2012
PDOWNA  005616           1705#  1706
PDSTP   005622           1700*  1707#  1711
PEA     012474           2410   2420   2423#
PEND    012362           1351   1532   1582   2402#
PREDJS  004636           1526   1530#
PREDT   003730           1073   1345   1349#
PREDTA  003744           1350   1352#
PREST   002100           1066#  1590   1594   1598   1602   1606   1610   1614   1618   1622   1626   1630   1634
                         2139
PRESTA  002124           1067   1069   1071#
PRESTB  002140           1072   1074#
PS    = 177776            712#  1674   1702
PUP     005624           1701   1711#
QADCK   011110           2177   2193#
QADCKA  011130           2194   2197#
QADCKB  011154           2202#  2207
QADCKC  011176           2205   2208#
QADCKD  011202           2209#  2214
QBEG    010652           2135   2145#  2235   2244   2252
QDATA   011500           2212   2254#
QDCON   011626           2255   2275#  2282
QEND    011724           2291#
QERA    011224           2155   2163   2168   2179   2187   2189   2191   2216#
QERB    011324           2203   2210   2229#
QERC    011372           2198   2200   2237#
QERD    011442           2196   2247#
QHIDA   011042           2181#
QHIDAA  011056           2184#
QHISA   010720           2157#
QHISAA  010734           2160#
QJMPD   011560           2263   2266#  2273
QLODA   010776           2153   2170#
QLODAA  011012           2173#
QLOSA   010654           2146#
QLOSAA  010670           2149#
QSRC    001250            867#  2216*  2227   2345*  2350
QTSTNG  011672           2284#
RFLGS = 001143            713#  1087*  1109*  1130*  1151*  1185*  1218*  1251*  1284*  1316*  1365*  1391*  1412*
                         1431*  1451*  1470*  1491*  1510*  1552*  1809   1817   1825   1827   1848   1856   1864
                         1872   1880   1888   1899   1907   1915   1923   1931   1939
```

```
RTT   = 000006            716#   2026
SAVCAD  001166            842#   1805    1974*
SAVCAX  001170            843#   1813    1975*
SAVCWP  001172            844#   1821    1976*
SAVE    007342           1787    1969#
SAVERC  001264            873#   1979*
SAVFLG  001206            850#   1969*
SAVITC  001174            845#   1977*
SAVOKC  001176            846#   1978*
SAVPC   001160            839#   1791    1970*   1971*
SAVPS   001162            840#   1800    1972*
SAVR0   001200            847#   1980*
SAVR1   001202            848#   1981*
SAVSTP  001204            849#   1982*   1983*
SAVSWR  001164            841#   1896    1973*
SCOPE = 104400            717#   1088    1110    1131    1152    1186    1219    1252    1285    1318    1366    1392    1413
                         1432    1452    1471    1492    1513    1559
SCORTN  001154            837#   1644*   1662    1739
SCOSVC  005370           1641#   2014
SCW00   001302            889#   1149    1216    1282    1317
SCW01   001304            890#
SCW02   001306            891#
SCW03   001310            892#
SCW04   001312            893#
SCW05   001314            894#
SCW06   001316            895#
SCW07   001320            896#
SCW10   001322            897#
SCW11   001324            898#
SCW12   001326            899#
SCW13   001330            900#
SCW14   001332            901#
SCW15   001334            902#
SCW16   001336            903#
SCW17   001340            904#   1183    1249    1538
SCW20   001342            905#
SCW21   001344            906#
SCW22   001346            907#
SCW23   001350            908#
SCW24   001352            909#
SCW25   001354            910#
SCW26   001356            911#
SCW27   001360            912#
SCW30   001362            913#
SCW31   001364            914#
SCW32   001366            915#
SCW33   001370            916#
SCW34   001372            917#
SCW35   001374            918#
SCW36   001376            919#
SCW37   001400            920#
SCW40   001402            921#
SCW41   001404            922#
SCW42   001406            923#
SCW43   001410            924#
SCW44   001412            925#
```

```
SCW45   001414            926#
SCW46   001416            927#
SCW47   001420            928#
SCW50   001422            929#
SCW51   001424            930#
SCW52   001426            931#
SCW53   001430            932#
SCW54   001432            933#
SCW55   001434            934#
SCW56   001436            935#
SCW57   001440            936#
SCW60   001442            937#
SCW61   001444            938#
SCW62   001446            939#
SCW63   001450            940#
SCW64   001452            941#
SCW65   001454            942#
SCW66   001456            943#
SCW67   001460            944#
SCW70   001462            945#
SCW71   001464            946#
SCW72   001466            947#
SCW73   001470            948#
SCW74   001472            949#
SCW75   001474            950#
SCW76   001476            951#
SCW77   001500            952#   1339
SDS   = 000004            731#   1054   1597   1609   1621   1633
SES   = 000001            733#   1793
SF    = 000100            749#   1087   1109   1130   1825
SLS   = 040000            722#   1659   1736
SRF   = 000172            751#   1151   1185   1218   1251   1284   1316
STMADV  002230           1090   1098#
STMBEG  002154           1075   1084#
STMEND  002236           1097   1100#
STMERR  002220           1092   1095#
STMLOP  002202           1089#  1099
STMOK   002216           1094#
STMTS   002214           1086   1093#
STS   = 020000            723#   1731
STOBEG  002250           1076   1101   1107#
STOEND  002322           1118   1121#
STOERR  002304           1114   1116#
STOLOP  002272           1111#  1120
STOOK   002302           1112   1115#
STOTS   002276           1108   1113#
ST1BEG  002334           1122   1128#
ST1END  002410           1139   1142#
ST1ERR  002372           1135   1137#
ST1LOP  002356           1132#  1141
ST1OK   002370           1133   1136#
ST1TS   002364           1129   1134#
ST2BEG  002422           1143   1148#
ST2END  002602           1173   1176#
ST2ERR  002564           1161   1163   1165   1167   1169   1171#
ST2LOP  002446           1153#  1175
```

```
ST2OK   002562          1170#
ST3BEG  002606          1176    1182#
ST3END  002770          1207    1210#
ST3ERR  002752          1195    1197    1199    1201    1203    1205#
ST3LOP  002632          1187#   1209
ST3OK   002750          1204#
ST4BEG  002774          1210    1215#
ST4END  003154          1240    1243#
ST4ERR  003136          1228    1230    1232    1234    1236    1238#
ST4LOP  003020          1220#   1242
ST4OK   003134          1237#
ST5BEG  003160          1243    1248#
ST5END  003342          1274    1277#
ST5ERR  003324          1262    1264    1266    1268    1270    1272#
ST5LOP  003204          1253#   1276
ST5OK   003322          1271#
ST6BEG  003346          1277    1281#
ST6END  003530          1306    1309#
ST6ERR  003512          1294    1296    1298    1300    1302    1304#
ST6LOP  003372          1286#   1308
ST6OK   003510          1303#
ST7BEG  003534          1309    1315#
ST7END  003724          1342    1345#
ST7ERR  003700          1328    1330    1332    1334    1336    1338#
ST7L1   003554          1319#   1340
ST7L2   003546          1317#   1344
ST7OK   003676          1337#
SWR     001136           827#   1054    1057    1663    1676    1993*   1998*
S.ORD   000200           762#
S.ORDA  001010           778#
TAXS    007256          1945#
TAXSA   007306          1949    1951#
TBD     006404          1823#
TBDA    006452          1826    1832#
TBDB    006466          1828    1835#
TCAD    006274          1802#
TCAX    006314          1807#
TCAXA   006342          1810    1812#
TCWP    006350          1815#
TCWPA   006376          1818    1820#
TDBC    006476          1831    1834    1837#
TEX     007314          1795    1954#
TFLGS   006500          1839#
TGMF    006552          1854#
TGMFA   006600          1857    1859#
TGWD    006516          1846#
TGWDA   006544          1849    1851#
TGWO    006606          1862#
TGWOA   006634          1865    1867#
TGW2    006642          1870#
TGW2A   006670          1873    1875#
TGW4    006676          1878#
TGW4A   006724          1881    1883#
TGW6    006732          1886#
TGW6A   006760          1889    1891#
TKB   = 177562           705#   2306
```

```
TKS   = 177560          704#  2303*  2304
TLMT    001244          865#
TMF     001230          859#  1154*  1160  1188*  1194  1221*  1227  1255*  1261  1287*  1293  1321*  1327
                       1911
TPB   = 177566          707#  2310*  2367*
TPC     006220         1788#
TPS   = 177564          706#  2308   2357
TPST    006254         1794   1797#
TSS   = 000020          729#  1655
TSWR    006766         1893#
TTCTL   005516         1658   1674#
TTCTLA  005542         1677   1679#  1704
TTCTLB  005550         1679   1681#
TTMF    007042         1905#
TTMFA   007070         1908   1910#
TTS   = 010000          724#  1589   1593  1597  1601  1605  1609  1676
TTSVC   005552         1689#  2010   2026*
TTWD    007006         1897#
TTWDA   007034         1900   1902#
TTWO    007076         1913#
TTWOA   007124         1916   1918#
TTW2    007132         1921#
TTW2A   007160         1924   1926#
TTW4    007166         1929#
TTW4A   007214         1932   1934#
TTW6    007222         1937#
TTW6A   007250         1940   1942#
TWD     001232          860#  1415*  1434*  1435  1454*  1473*  1474  1494*  1495  1515*  1516  1563*  1566
                       1903
TWO     001234          861#  1156*  1162  1190*  1196  1223*  1229  1257*  1263  1289*  1295  1323*  1329
                       1565*  1568   1919
TW2     001236          862#  1157*  1164  1191*  1198  1224*  1231  1258*  1265  1290*  1297  1324*  1331
                       1927
TW4     001240          863#  1158*  1166  1192*  1200  1225*  1233  1259*  1267  1291*  1299  1325*  1333
                       1935
TW6     001242          864#  1159*  1168  1193*  1202  1226*  1235  1260*  1269  1292*  1301  1326*  1335
                       1943
TYPE    012502         2016   2428#
TYPEA   012174          804   1751   1759  1766  1772  1776  1788  1797  1802  1807  1815  1823  1829
                       1832   1835   1839  1846  1854  1862  1870  1878  1886  1893  1897  1905  1913
                       1921   1929   1937  1945  1954  1960  2105  2113  2117  2122  2126  2146  2157
                       2170   2181   2217  2229  2237  2247  2256  2266  2275  2284  2346  2355#  2395
                       2407   2411   2415  2421
TYPEAA  012206         2357#  2358   2362  2368
TYPEAB  012234         2360   2365#
TYPEAC  012250         2366   2369#
TYPEAD  012262         2371   2373#
TYPENR  007324         1811   1819   1850  1858  1866  1874  1882  1890  1901  1909  1917  1925  1933
                       1941   1950   1960#
TYPEO   012266         1774   1778   1790  1799  1804  1812  1820  1841  1851  1859  1867  1875  1883
                       1891   1895   1902  1910  1918  1926  1934  1942  1951  2380#  2413
TYPEOA  012310         2387#  2398
TYPEOB  012336         2386   2394#
TYPEOC  012350         2380*  2384*  2387*  2389*  2391*  2393*  2394*  2396#
TYPERR  006214          808   1657   1741  1787#
TYPSRC  001246          866#  2216   2345  2355*  2356*
```

```
WDF    = 000004            745#   1848    1899
W0F    = 000020            747#   1864    1915
W26F   = 000040            748#   1872    1880    1888    1923    1931    1939
.      = 012575            761#    769#    777#    786#    793#    800#


. ABS.  012575     000


 ERRORS DETECTED:  0

 CZCBAC.BIN,CZCBAC.LST/CRF/SOL/NL:TOC=CZCBAC.P11
 RUN-TIME: 3 5 1 SECONDS
 RUN-TIME RATIO: 140/10=13.8
 CORE USED:  11K  (21 PAGES)
```