CD11/CD20

CD DIAGNOSTIC

MD-11-DZCDB-A

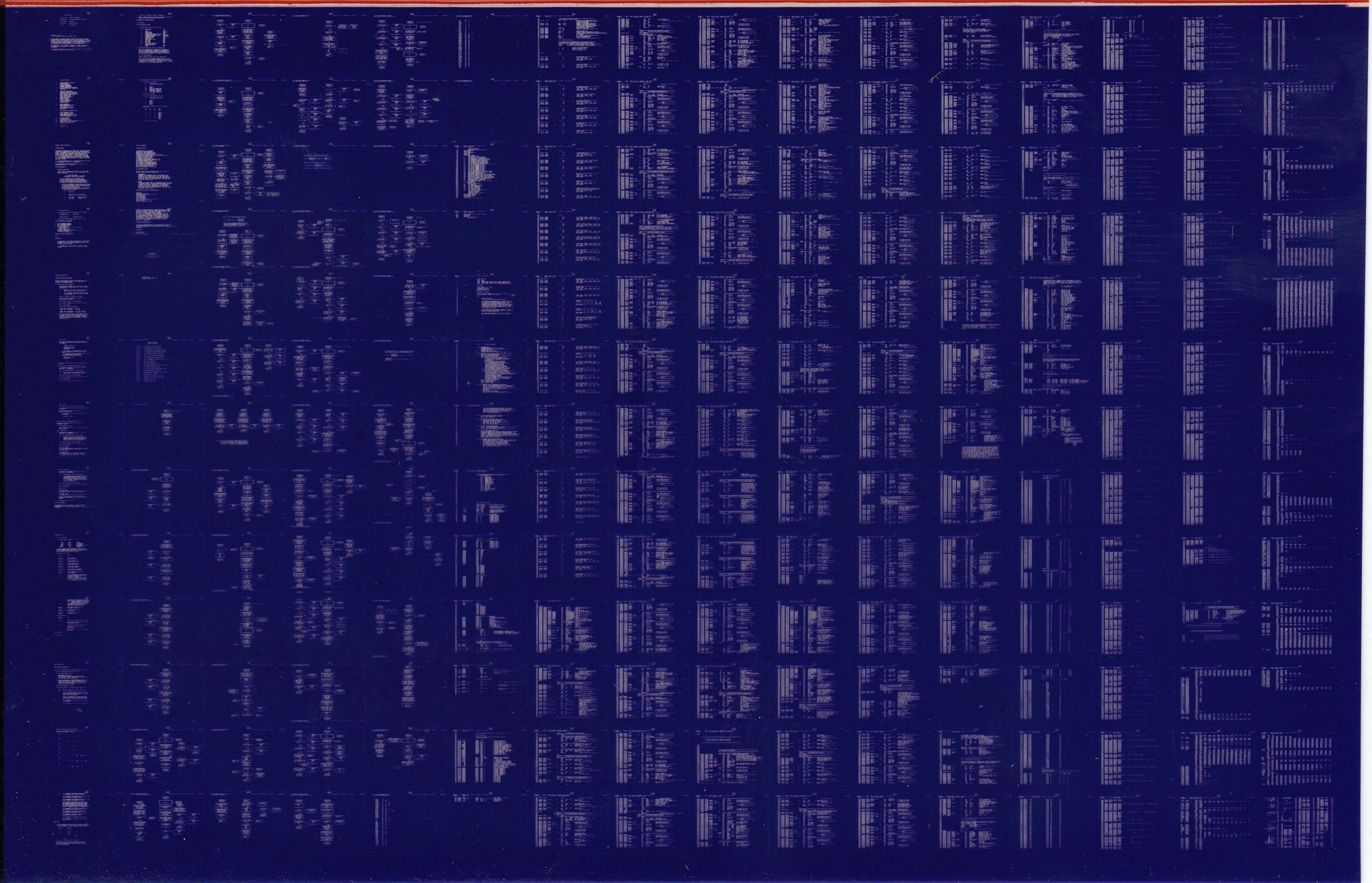
EP-DZCDB-A-DL-A

FICHE 1 OF 2

NOV 1976

digital

MADE IN USA



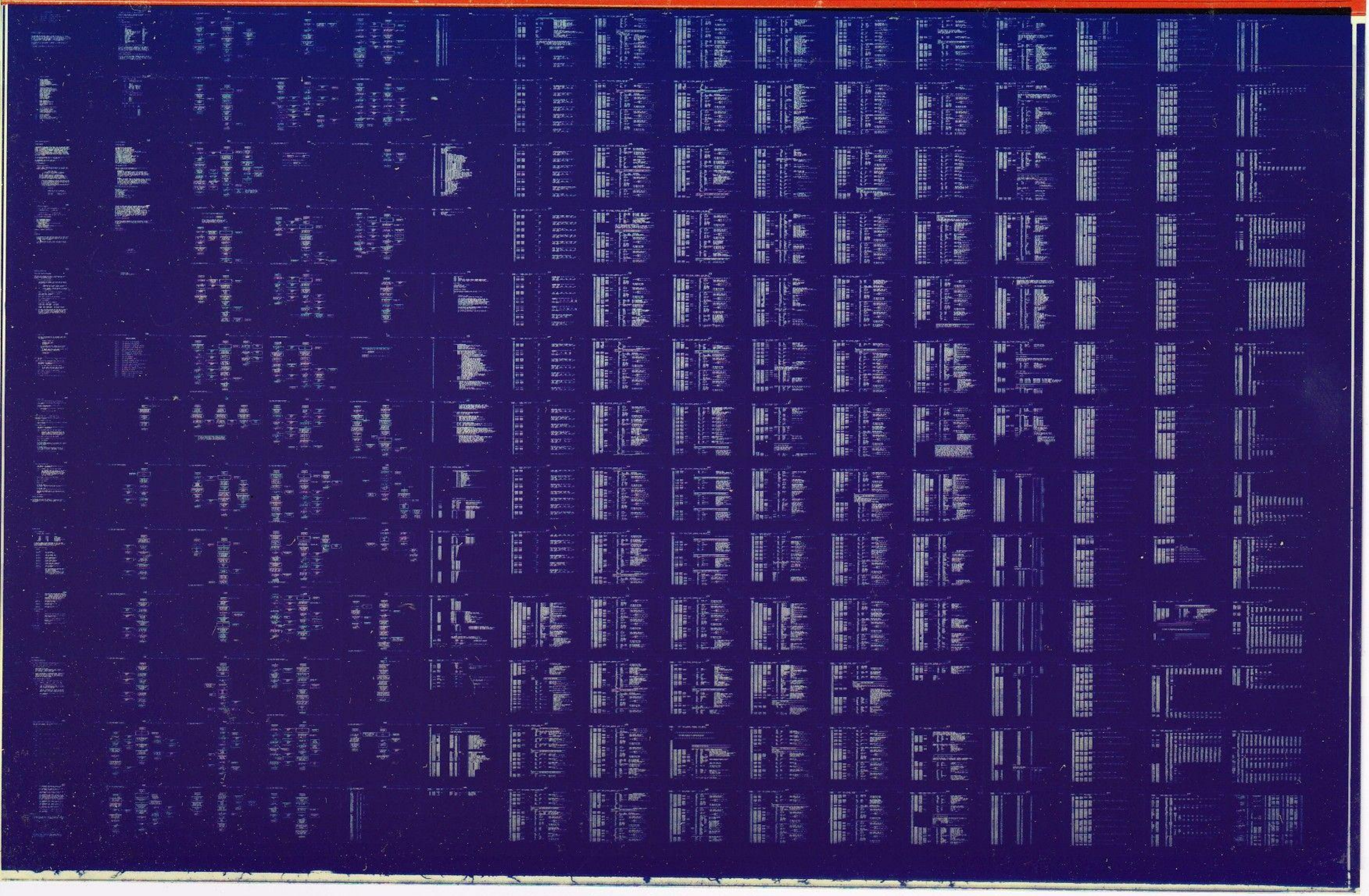
CD11/CD20

DIAGNOSTIC

AH-0030A-MC

FICHE 1 OF 2

MADE IN U.S.A.



CD11/CD20

CD DIAGNOSTIC

MD-11-DZCDB-A

EP-DZCDB-A-DL-A

FICHE 2 OF 2

NOV 1976

digital

MADE IN USA

CD11/CD20

DIAGNOSTIC

AH-0030A-MC

11-D2CDB-A-DL-A

FICHE 2 OF 2

NOV 1976

digital

MADE IN U.S.A.

IDENTIFICATION

SEQ 0001

PRODUCT CODE: MINDEC-11-DZCDB-A-D

PRODUCT NAME: CD11/CD20 CARD READER DIAGNOSTIC

DATE CREATED: 21-MAR-1976

MAINTAINER: DIAGNOSTIC GROUP

AUTHOR: BRUCE BURGESS

TABLE OF CONTENTS

1.0 GENERAL PROGRAM INFORMATION

1.1 PROGRAM PURPOSE

THIS PROGRAM CAN BE USED WITH EITHER A CD11 OR CD20 CARD READER INTERFACE TO A DOCUMATION M1000, M200 OR AN M1200 MODEL CARD READER. THE PROGRAM TESTS ALL LOGIC FUNCTIONS OF THE CARD READER AS WELL AS EXERCISING ALPHANUMERIC AND BINARY CODED DATA VIA PUNCHED CARD TEST DECKS. SEPARATE STARTING ADDRESSES ALLOW TESTING OF ERROR FUNCTIONS (E.G. - HOPPER CHECK, STACK CHECK, ETC.) FOR ALL CARD READER MODELS UTILIZING MANUAL TECHNIQUES. TO AID IN DIAGNOSING SPECIAL PATTERNS A SECTION OF THE PROGRAM WILL ALLOW TESTING OF CARD DECKS WITH ALL COLUMNS OF EACH CARD IDENTICALLY PUNCHED.

THE DISTINCTION BETWEEN THE CD11 AND CD20 CARD READER INTERFACES WILL BE DESCRIBED IN SECTION 1.2, PARAGRAPH A.

THE ALPHANUMERIC AND BINARY TEST DECKS TO BE USED WILL BE DESCRIBED IN SECTION 1.2, PARAGRAPH B.

1.2 SYSTEM REQUIREMENTS

A. HARDWARE REQUIREMENTS

A PDP-11 FAMILY COMPUTER WITH EITHER A CD11 OR CD20 CARD READER INTERFACE TO A DOCUMATION MODEL CARD READER (MODELS M200, M1000, M1200).

***** NOTE *****
A MINIMUM OF 12K OF MEMORY IS REQUIRED FOR LOADING & RUNNING THIS DIAGNOSTIC!

1. THE CD20 INTERFACE IS A CD11 INTERFACE WITH ECO #CD-11-00014 INSTALLED. THE CD20 INTERFACE IS USED WITH THE DECSYSTEM 20 SERIES OF COMPUTERS. THE ECO IMPLEMENTS THE FOLLOWING ADDITIONAL SOFTWARE FEATURES INTO THE NORMAL CD11 CARD READER CONTROLLER:

   A. DURING DATA TRANSFERS IN UNPACKED MODE BITS 15 THRU 12 IN THE DATA REGISTER (177166) HAVE BEEN REDEFINED TO INDICATE MORE THAN ONE BIT SET IN A ZONE (BIT15) AND WHICH ZONE (BITS 14 THRU 12).
   B. DURING NON-DATA TRANSFERS PERIODS THE DATA REGISTER (177166) IS USED AS A SECOND STATUS REGISTER WITH BIT DEFINITIONS AS FOLLOWS:

BIT	DEFINITION		
15	ALWAYS SET IF ECO IS INSTALLED		
14	ALWAYS CLEAR IF ECO NOT INSTALLED		
14	READ CHECK	!	BREAKOUT OF BIT14 OF
13	PICK CHECK	!	STATUS REGISTER
12	STACK CHECK	!	(177160)

B. SOFTWARE REQUIREMENTS SEQ 0004

TWO MAIN CARD TEST DECKS ARE REQUIRED BY THIS PROGRAM:

ALPHANUMERIC DECK	BINARY DECK
MAINDEC-89-D1B1-C	MAINDEC-89-D1B2-C

IN ADDITION TO SPARE CARDS FOR ERROR FUNCTION TESTING.

1.3 RELATED DOCUMENTS AND STANDARDS

A. CD11 ENGINEERING DRAWINGS
B. PDP11 PERIPHERALS HANDBOOK
C. PDP11 PROCESSOR HANDBOOK
D. MAINDEC-11-DZQAC-B1
   SYSMAC.SML DIAGNOSTIC UTILITIES PACKAGE
E. MAINDEC-11-DZQXA
   'XXDP' USER'S GUIDE
F. DIAGNOSTIC ENGINEERING STANDARDS AND CONVENTIONS
   PROGRAMMING PRACTICES
   DOC. NO. 175-003-009-00

1.4 DIAGNOSTIC HIERARCHY PREREQUISITES

NONE.

1.5 ASSUMPTIONS

A. IT IS ASSUMED THAT BOTH CARD TEST DECKS ARE IN THEIR PROPER SEQUENCE. IT IS A GOOD IDEA UPON RECEIVING THE TEST DECKS TO NUMBER THEM IN THE TOP RIGHT CORNER IN THE EVENT THAT THEY ARE ACCIDENTLY DROPPED.

B. IT IS ASSUMED THAT ECO #CD-11-00014 HAS BEEN INSTALLED WHEN THIS PROGRAM IS BEING RUN ON A DECSYSTEM 20 SERIES COMPUTER.

2.0 OPERATING INSTRUCTIONS

2.1 LOADING AND STARTING PROCEDURES

THERE ARE FIVE DISTINCT SECTIONS TO THE PROGRAM EACH HAVING ITS OWN STARTING ADDRESS, SWITCH SETTINGS, AND MODES OF OPERATION. THEY ARE AS FOLLOWS:

A. INSTRUCTION & DATA RELIABILITY

1. LOAD PROGRAM INTO MEMORY. ON A DECSYSTEM 20 SERIES COMPUTER THIS IS ACCOMPLISHED VIA A 'FLOPPY' DISKETTE ON UNIT 0 BY -

   1ST- DEPRESSING THE 'FLOPPY' SWITCH (ON FRONT END PANEL) TO LOAD 'RXDP' (FLOPPY MONITOR)

   2ND- TYPING 'DZCDB*' (CARRIAGE RETURN) ON CONSOLE TTY IN RESPONSE TO THE 'RXDP' MONITOR REQUEST FOR INPUT (A DOT.).

   WHERE * = LATEST REV. LETTER OF THE PROGRAM

2. LOAD A TEST DECK (ALPHANUMERIC OR BINARY) INTO THE CARD READER INPUT HOPPER

3. PRESS 'RESET' BUTTON ON THE CARD READER

4. SET A STARTING ADDRESS OF 200 INTO SWITCH REGISTER

5. PRESS 'LOAD ADDRESS'

6. SET SWITCHES FOR MODE OF OPERATION:

   'ALPHA' DECK (IMAGE MODE) - SET SW<02>
   'ALPHA' DECK (PACK MODE) - SET SW<03>

   'BINARY' DECK (IMAGE MODE) - SET SW<02> & SW<04>
   'BINARY' DECK (PACK MODE) - SET SW<03> & SW<04>

NOTE: WITH ONLY THE ABOVE SWITCHES SET FOR MODE OF OPERATION THE PROGRAM WILL PASS THRU THE INSTRUCTION PORTION ONLY ONCE (1ST PASS). ON ALL SUBSEQUENT PASSES THE PROGRAM WILL LOOP ON THE DATA RELIABILITY PORTION. TO ALTER THIS APPROACH SET OTHER SWITCHES AS INDICATED UNDER SECTION 2.3.

7. PRESS 'START'

8. WITH ONLY THE SWITCHES SET AS INDICATED UNDER ITEM 6., PASS COMPLETION PRINTOUTS SHOULD APPEAR AS FOLLOWS (AN EXAMPLE):

```
        MAINDEC-11-DZCD8  REV.A

        ENTERING LOGIC TESTS
        ENTERING DATA TESTS
        END PASS #1

*    AT THIS POINT THE INPUT HOPPER SHOULD BE EMPTY  *
*    AND THE PROGRAM WILL HANG WAITING, AT WHICH     *
*    POINT -                                         *
*       A. RELOAD TEST DECK/S INTO INPUT HOPPER, AND *
*       B. PRESS 'RESET' ON CARD READER              *
*    PROGRAM SHOULD RESUME OPERATION WITH.           *

        ENTERING DATA TESTS
        END PASS #2
             .
             .
             ETC.
```

NOTE: THE FORM OF THE PRINTOUT WILL VARY AS OTHER SWITCHES ARE SET.

B. ERROR FUNCTIONS FOR CARD READER MODELS M200 OR M1000

1. LOAD PROGRAM INTO MEMORY AS INDICATED BY SECTION 2.1, PARAGRAPH A., SUBPARAGRAPH 1.

2. LOAD A FEW SPARE CARDS INTO THE INPUT HOPPER.

   NOTE: DO NOT LOAD A TEST DECK HERE AS PORTIONS OF ERROR FUNCTION TESTING DESTROYS CARDS!

3. PRESS 'RESET' BUTTON ON THE CARD READER

4. SET A STARTING ADDRESS OF 210 INTO SWITCH REGISTER.

5. PRESS 'LOAD ADDRESS'

6. SET DESIRED SWITCHES AS INDICATED BY SECTION 2.3

7. PRESS 'START'

8. FOLLOW THE INSTRUCTIONS AS THEY ARE PRINTED OUT

   A FULL PASS OF THIS SECTION SHOULD APPEAR AS FOLLOWS
   (AN EXAMPLE):

```
ENTERING M1000/M200 ERROR FUNCTION TESTS
MAINDEC-11-DZCDB  REV.A

*    INSTRUCTIONS FOLLOW AND UPON A COMPLETE PASS    *
*    WILL APPEAR,                                    *

        MAINDEC-11-DZCDB  REV.A
                .
                .
               ETC.
```

C. ERROR FUNCTIONS FOR CARD READER MODEL M1200

   EVERYTHING APPLIES AS INDICATED UNDER SECTION 2.1,
   PARAGRAPH B., EXCEPT:

   1. START ADDRESS IS 250, AND

   2. LEAD-IN MESSAGE UPON EXECUTION IS "ENTERING M1200 ERROR
      FUNCTION TESTS"

D. SINGLE SUBTEST LOOP

1. LOAD PROGRAM INTO MEMORY AS INDICATED BY SECTION 2.1,
   PARAGRAPH A., SUBPARAGRAPH 1.

2. LOAD A FEW SPARE CARDS INTO THE INPUT HOPPER

   NOTE: SINCE ONLY THE INSTRUCTION PORTION OF THE
         PROGRAM IS MEANT TO BE SELECTED UNDER THIS
         PHASE OF OPERATION A CARD TEST DECK MAY BE
         SUBSTITUTED IN PLACE OF THE SPARE CARDS.

3. PRESS 'RESET' BUTTON ON THE CARD READER

4. SET A STARTING ADDRESS OF 220 INTO SWITCH REGISTER

5. PRESS 'LOAD ADDRESS'

6. AT THE 1ST 'HALT':
   LOAD THE STARTING ADDRESS OF THE DESIRED TEST (ADDRESS
   OF 'SCOPE' INSTRUCTION AT BEGINNING OF TEST), THEN
   PRESS 'CONTINUE'.

7. AT THE 2ND 'HALT':
   SET DESIRED SWITCHES AS INDICATED BY SECTION 2.3
   (SW<11> MUST NOT BE SET), THEN PRESS 'CONTINUE'
    *** HOWEVER *** (SW<14> MUST BE SET... MUST BE SET ...)

8. PROGRAM WILL LOOP ON TEST SELECTED

E. SINGLE DATA PATTERN TEST

1. LOAD PROGRAM INTO MEMORY AS INDICATED BY SECTION 2.1, PARAGRAPH A., SUBPARAGRAPH 1.

2. LOAD A 'PREPARED' DECK INTO THE INPUT HOPPER

   NOTE: THE 'PREPARED' DECK CAN CONSIST OF ONE OR MORE CARDS AND HAVE ANY DATA PATTERN BUT THIS PATTERN MUST BE IDENTICAL IN ALL 80 COLUMNS OF EACH AND EVERY CARD MAKING UP THE DECK (E.G., IF COLUMN 1 CONTAINS 1777 SO MUST ALL THE OTHER 79 COLUMNS).

3. PRESS 'RESET' BUTTON ON THE CARD READER

4. SET A STARTING ADDRESS OF 240 INTO SWITCH REGISTER

5. PRESS 'LOAD ADDRESS'

6. PRESS 'START'

7. AT THE 1ST 'HALT'
   SET THE DATA PATTERN SELECTED INTO THE SWITCH REGISTER USING SWS<11 THRU 00>, THEN PRESS 'CONTINUE'

8. AT THE 2ND 'HALT'
   SET DESIRED SWITCHES AS INDICATED BY SECTION 2.3

9. WHEN THE CARD READER RUNS OUT OF CARDS RELOAD THE 'PREPARED' DECK AND PRESS 'RESET' BUTTON ON THE CARD READER

10. THE PROGRAM SHOULD CONTINUE

2.2 SPECIAL ENVIRONMENTS

THE PROGRAM DOES HAVE THE CAPABILITY TO BE RUN ON THE ACT-11 MANUFACTURING LINE BUT IS NOT IDEALLY SUITED FOR THIS ENVIRONMENT DUE TO THE PROGRAM'S REQUIREMENT OF LOADING CARD TEST DECKS.

2.3 PROGRAM OPTIONS

A. DEFAULT PARAMETERS

LOCATION LABEL	CONTENTS	USE
CDST:	177160	STATUS
CDCC:	177162	COLUMN COUNT
CDBA:	177164	BUS ADDRESS
CDDB:	177166	DATA/(STATUS ON CD20)
INTVEC:	230	INTERRUPT PC
INTVEC+2:	232	INTERRUPT PS

IF THE CD11/CD20 IS EVER CONFIGURED SO THAT THE ABOVE STANDARD ADDRESSES AND VECTORS ARE NOT RELEVENT THEN JUST PATCH THE ABOVE PROGRAM LOCATIONS TO THE CORRECT VALUES BEFORE ATTEMPTING TO EXECUTE THE PROGRAM.

B. CONTROL SWITCH SETTINGS

SWITCH	USE
SW<15>=1	HALT ON ERROR
SW<15>=0	CONTINUE ON ERROR
SW<14>=1	LOOP ON CURRENT TEST
SW<14>=0	CONTINUE TO NEXT TEST
SW<13>=1	INHIBIT ERROR PRINTOUT
SW<13>=0	PRINT ERROR REPORTS
SW<12>=1	INHIBIT TRACE TRAPPING
SW<12>=0	ALLOW TRACE TRAPPING
SW<11>=1	INHIBIT SUB-TEST ITERATIONS
SW<11>=0	ALLOW SUB-TEST ITERATIONS
SW<07>=1	LOOP ON INSTRUCTION TESTS ONLY
SW<07>=0	NOT APPLICABLE
SW<06>=1	LOOP ON INSTRUCTION & DATA RELIABILITY TEST WHEN CONTINUING FROM ONE CARD TEST DECK TO ANOTHER.
SW<06>=0	INSTRUCTION & DATA RELIABILITY TEST COVERED ON 1ST CARD TEST DECK LOAD. ONLY DATA RELIABILITY TEST COVERED ON ALL SUBSEQUENT CARD TEST DECK LOADS.

SW<05>=1 WHEN MORE THAN ONE CARD TEST DECK IS LOADED 'HALT' AT COMPLETION OF EACH DECK.
NOTE: PRESSING 'CONTINUE' WILL RESUME PROGRAM OPERATION AFTER THE 'HALT'.

SW<05>=0 WHEN MORE THAN ONE CARD TEST DECK IS LOADED RUN THE DATA RELIABILITY TEST AUTOMATICALLY FROM DECK TO DECK.

SW<04>=1 INDICATOR FOR BINARY TEST DECK
SW<04>=0 NOT BINARY TEST DECK

SW<03>=1 INDICATOR FOR PACK MODE
SW<03>=0 NOT PACK MODE

SW<02>=1 INDICATOR FOR IMAGE MODE
SW<02>=0 NOT IMAGE MODE

C. STARTING ADDRESSES

ADDRESS	USE
200	INSTRUCTION & DATA RELIABILITY TESTING
210	ERROR FUNCTION TESTING OF CARD READER MODELS M200 OR M1000
220	LOOPING ON A SINGLE INSTRUCTION TEST
240	READING A SINGLE DATA PATTERN CONTINUOUSLY
250	ERROR FUNCTION TESTING OF CARD READER MODEL M1200

2.4 EXECUTION TIMES

(TO BE DETERMINED)

3.0 ERROR INFORMATION

3.1 ERROR REPORTING PROCEDURES

THREE TYPES OF ERROR REPORTING TECHNIQUES ARE USED AS FOLLOWS:

A. WHEN INPUT HOPPER GOES EMPTY DURING TESTING

THE FOLLOWING MESSAGE IS TYPED:

```
CARD READER IS OFF-LINE
REMEDY THE CONDITION BY RELOADING INPUT HOPPER
WITH CARD DECK - PRESS 'RESET' BUTTON ON CARD READER
AND 'CONTINUE' SWITCH ON CPU PANEL
```

NOTE: ALLOW A FEW SECONDS TO TRANSPIRE BETWEEN PRESSING THE 'RESET' BUTTON AND THE 'CONTINUE' SWITCH AS IF THIS OPERATION IS DONE TOO QUICKLY THE CARD READER WILL NOT HAVE HAD A CHANCE TO RESET ITSELF AND THE ABOVE REPORT WILL ONLY BE REITERATED

B. DURING DATA RELIABILITY TESTING

THE FOLLOWING FORMAT IS TYPED WHEN A DATA ERROR OCCURS:

```
DECK    CARD NUM    CARD COL    SHB     WAS
```

WHERE: 'DECK' REPRESENTS EITHER 'ALPHA' OR 'BINARY'

'CARD NUM' REPRESENTS WHICH CARD OUT OF THE 80. CARDS ON WHICH THE ERROR WAS FOUND. 'CARD NUM' VALUE IS PRINTED IN DECIMAL.

'CARD COL' REPRESENTS THE COLUMN ON THE CARD (SPECIFIED BY 'CARD NUM') WHICH CONTAINS THE ERROR. 'CARD COL' VALUE IS PRINTED IN DECIMAL.

'SHB' REPRESENTS THE ENCODED VALUE THAT SHOULD BE INTERPRETED.

'WAS' REPRESENTS THE VALUE THAT WAS INTERPRETED.

C. GENERAL ERRORS DURING PROGRAM OPERATION

THERE ARE SEVEN GENERAL TYPES OF ERROR REPORTS IN USE THROUGHOUT THE PROGRAM AS FOLLOWS:

TYPE 1

(PC) (SP) (CDS) (CDD) (PS)

TYPE 2

(PC) (SP) (CDS) (CDD) (CDC) (PS)

TYPE 3

(PC) (SP) (CDS) (CDD) (CDA) (PS)

TYPE 4

(PC) (SP) (CDS) (CDD) (CDC) (CDA) (PS)

TYPE 5

(PC) (SP) (CDS) (CDD) (CDC) WAS (CDA) SHB (CDA) (PS)

TYPE 6

(PC) (SP) (CDS) (CDD) (CDC) WAS (CDA) (CDC) SHB (PS)

TYPE 7

(PC) (SP) (CDS) (CDD) WAS (CDD) SHB (PS)

WHERE: (PC) REPRESENTS THE PROGRAM COUNTER LOCATION IN THE PROGRAM WHERE THE ERROR OCCURRED.

(SP) REPRESENTS THE CURRENT POSITION OF THE STACK POINTER (GENERAL PURPOSE REGISTER 6)

(CDS) REPRESENTS THE CURRENT CONTENTS OF THE CARD READER CONTROL STATUS REGISTER (177160)

(CDD) REPRESENTS THE CURRENT CONTENTS OF THE DATA BUFFER. INFORMATION IS ONLY VALID DURING DATA TRANSFERS EXCEPT ON THE CD20 CARD READER WHICH USES THE DATA BUFFER REGISTER (177166) AS A 2ND STATUS REGISTER DURING NON-DATA TRANSFER PERIODS. (REFERENCE SECTION 1.2, PARAGRAPH A.)

(CDC) REPRESENTS THE CURRENT CONTENTS OF THE CARD READER COLUMN COUNT REGISTER (177162)

(CDA) REPRESENTS THE CURRENT CONTENTS OF THE CARD READER BUS ADDRESS REGISTER (177164)

(PS) REPRESENTS THE CURRENT CONTENTS OF THE PROCESSOR STATUS REGISTER (177776)

'WAS' REPRESENTS THE INCORRECT VALUE FOUND

'SHB' REPRESENTS THE CORRECT VALUE THAT SHOULD HAVE BEEN FOUND

3.2 ERROR HALTS

A. ALL UNUSED LOCATIONS FROM LOCATION 4 TO LOCATION 776 CONTAINS A .+2, HALT SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS. LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS. I.E.,

LOCATION	CONTENTS
0	HALT
4	6
6	HALT
10	12
12	HALT
.	
.	
ETC.	

B. WHEN SW<15>=1 INDICATING TO HALT ON ERROR

C. DURING ERROR FUNCTION TESTING OF READ CHECK, WHEN AN INTERRUPT DOES NOT OCCUR AFTER CARDS HAVE BEEN RESTORED TO THE INPUT HOPPER AND THE 'RESET' BUTTON ON THE CARD READER HAS BEEN PRESSED.

D. IF THERE IS NO TERMINAL TO OUTPUT INFORMATION

E. DURING A POWER FAILURE IF THE POWER UP SEQUENCE WAS STARTED BEFORE THE POWER DOWN SEQUENCE HAD COMPLETED.

4.0 PERFORMANCE AND PROGRESS REPORTS

NOT APPLICABLE

5.0 DEVICE INFORMATION TABLES

A. STATUS REGISTER (177160) BIT DESIGNATIONS

BIT	DESIGNATION	MODE
0	READ	WRITE
1	DATA PACKING	READ/WRITE
2	HOPPER EMPTY	READ
3	READER TRANSITION TO ON-LINE	READ
4	EXTENDED BUS ADDRESS (BIT16)	READ/WRITE
5	EXTENDED BUS ADDRESS (BIT17)	READ/WRITE
6	INTERRUPT ENABLE	READ/WRITE
7	CONTROLLER READY	READ
8	POWER CLEAR	WRITE
9	NON-EXISTANT MEMORY	READ
10	DATA LATE	READ
11	DATA ERROR	READ
12	OFF-LINE	READ
13	END OF FILE (M1200 ONLY)	READ
14	CARD READER ERROR (READ,STACK OR PICK)	READ
15	ERROR	READ

B. COLUMN COUNT REGISTER (177162) BIT DESIGNATIONS

BITS <15:0> CONTAIN THE 2'S COMPLEMENT OF THE NUMBER OF COLUMNS TO BE TRANSFERRED TO MEMORY WHEN CARDS ARE BEING READ. THE CONTENTS OF THIS REGISTER IS INCREMENTED BY 1 EACH TIME A COLUMN TRANSFER OCCURS AND ALL TRANSFERS ARE INHIBITED WHEN THE CONTENTS OF THIS REGISTER IS EQUAL TO 0.

ALL BITS ARE READ/WRITE.

C. CURRENT ADDRESS REGISTER (177164) BIT DESIGNATIONS

BITS <15:0> CONTAIN THE MEMORY ADDRESS INTO WHICH THE NEXT COLUMN OF DATA IS TO BE STORED. THIS REGISTER IS INITIALLY SET TO THE MEMORY LOCATION OF THE 1ST COLUMN TO BE READ. IT THEN INCREMENTS BY 1 FOR TRANSFERS IN PACK MODE; BY 2 FOR TRANSFERS IN NON-PACK MODE. ALL BITS ARE READ/WRITE.

D. DATA BUFFER REGISTER (177166) BIT DESIGNATIONS (READ ONLY) SEQ 0015

1. NON-PACK MODE (CD11/CD20)

BIT	CORRESPONDING CARD IMAGE
11	ZONE 12
10	ZONE 11
9-0	ZONES 0-9, RESPECTIVELY
15	ALWAYS SET (CD20 ONLY)
14	READ CHECK (CD20 ONLY)
13	PICK CHECK (CD20 ONLY)
12	STACK CHECK (CD20 ONLY)

2. PACK MODE (CD11/CD20)

BITS 7 THRU 3 ARE ENCODED AS FOLLOWS:

BIT	CORRESPONDING CARD IMAGE
7	ZONE 12
6	ZONE 11
5	ZONE 0
4	ZONE 9
3	ZONE 8

BITS 2 THRU 0 REPRESENT AN OCTAL CODE ENCODED AS FOLLOWS:

BIT 02	BIT 01	BIT 00	CARD ZONE
0	0	0	ZONES 1-7
0	0	1	ZONE 1
0	1	0	ZONE 2
0	1	1	ZONE 3
1	0	0	ZONE 4
1	0	1	ZONE 5
1	1	0	ZONE 6
1	1	1	ZONE 7

BITS 8 THRU 15 ARE UNUSED.

6.0 SUB-TEST SUMMARIES

6.1 INSTRUCTION TESTS

INITIALIZATION OF ALL REGISTERS
READ/WRITE OF STATUS REGISTER
READ/WRITE OF COLUMN COUNT REGISTER
READ/WRITE OF BUS ADDRESS REGISTER
CONTROLLER READY TO CLEAR BIT00 OF CDS (177160)
'HOPPER EMPTY' (BIT02 OF CDS) TO BE CLEAR AFTER CARD READ
INTERRUPT FROM CONTROLLER READY
NO INTERRUPT WITH CPU AT LEVEL 7
INTERRUPTS ON LEVELS 7 THRU 1
NO INTERRUPT WITH INTERRUPT ENABLE SET ONLY
SIMULTANEOUS INTERRUPTS AT MORE THAN 1 LEVEL
NON-EXISTANT MEMORY DETECTION
BYTE LOADING OF COLUMN COUNT REGISTER
BYTE LOADING OF BUS ADDRESS REGISTER
DATIP LOADING OF COLUMN COUNT REGISTER
DATIP LOADING OF BUS ADDRESS REGISTER
WORD COUNT OVERFLOW TO 2ND CARD
NON-PACK MODE TRANSFER TO ODD ADDRESS

6.2 DATA RELIABILITY TEST

TESTING IS DONE ON BOTH ALPHANUMERIC AND BINARY (PACKED AND UNPACKED) DATA UTILIZING 80. CARD DECKS.

A. ALPHANUMERIC
   REFERENCE THE ALPHANUMERIC TABLE IN THE PROGRAM LISTING (BEGINNING AT THE LABEL 'ALPCD:') FOR THE IMAGE CODES PUNCHED IN THE 80. COLUMNS OF THE 1ST CARD. EACH SUCCESSIVE CARD IN THE DECK USES THE SAME SEQUENCE OF CODES ROTATED ONE COLUMN TO THE LEFT. THE PACKED FORM OF THE IMAGE CODES FOLLOWS THE 'ALPCD:' TABLE.

B. BINARY
   REFERENCE THE BINARY TABLE IN THE PROGRAM LISTING, (BEGINNING AT THE LABEL 'BINCD:') FOR THE BINARY CODES PUNCHED IN THE 80. COLUMNS OF THE 1ST CARD. KEEP IN MIND THE ZONE ENCODING DISCUSSED IN SECTION 5, PARAGRAPH D). EACH SUCCESSIVE CARD IN THE DECK USES THE SAME SEQUENCE OF CODES ROTATED ONE COLUMN TO THE LEFT. THE PACKED FORM OF THE BINARY CODES FOLLOWS THE 'BINCD:' TABLE.

6.3 ERROR FUNCTION TESTS FOR M1000/M200/M1200

DATA LATE
ERROR AND OFF-LINE BITS
INTERRUPT ON OFF TO ON-LINE TRANSITION
INPUT HOPPER EMPTY
OUTPUT STACKER FULL
PICK CHECK ERROR
STACK CHECK ERROR
END OF FILE AND HOPPER CHECK (M1200 ONLY)
READ CHECK ERROR

6.4 READING A SINGLE DATA PATTERN

CHECKING OF CARDS WHICH HAVE ALL COLUMNS IDENTICALLY PUNCH
IS DONE, THUS ALLOWING SPECIFIC TYPES OF DATA FAILURES TO BE
MORE EASILY STUDIED. THE PATTERN INPUT FROM THE USER IS STORED
AND THEN EACH COLUMN OF EACH CARD IS COMPARED
AGAINST IT. IF A DISCREPANCY OCCURS, THE ERROR IS PRINTED
OUT, ALONG WITH THE TOTAL NO. OF CARDS READ AS WELL AS THE TOTAL
NO. OF DATA ERRORS DISCOVERED UP TO THAT POINT. (NOTE: ALL
PRINTOUTS ARE IN OCTAL). WHEN THE INPUT HOPPER BECOMES EMPTY,
THE TERMINAL WILL ECHO A 'BELL'. THE PROGRAM WILL THEN WAIT
FOR MORE CARDS TO BE LOADED AND THE CARD READER TO BE PUT
BACK ON-LINE (I.E., PRESSING 'RESET' BUTTON). (REFERENCE
SECTION 2.1, PARAGRAPH E.)

6.5 LOOPING ON A SELECTED TEST

THIS ALLOWS A SINGLE SUB-TEST TO BE RUN CONTINUOUSLY BY SELECTING
THE TEST (INSTRUCTION PORTION ONLY) AND LOADING THE ADDRESS
OF THE SCOPE INSTRUCTION AT THE BEGINNING OF THE TEST. (REFERENCE SECTION 2.1,
PARAGRAPH D.)

7.0 FLOW CHARTS

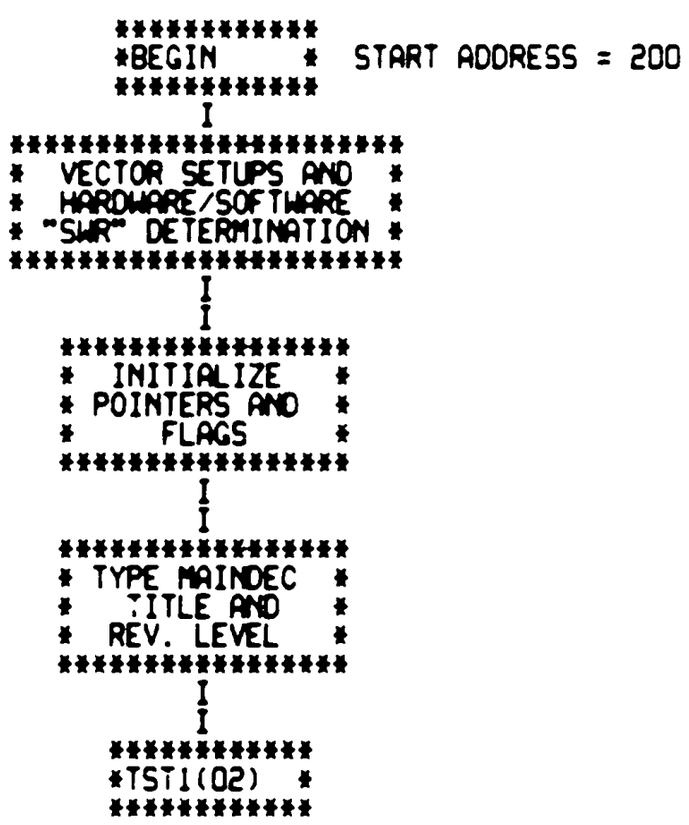
8.0 PROGRAM LISTING

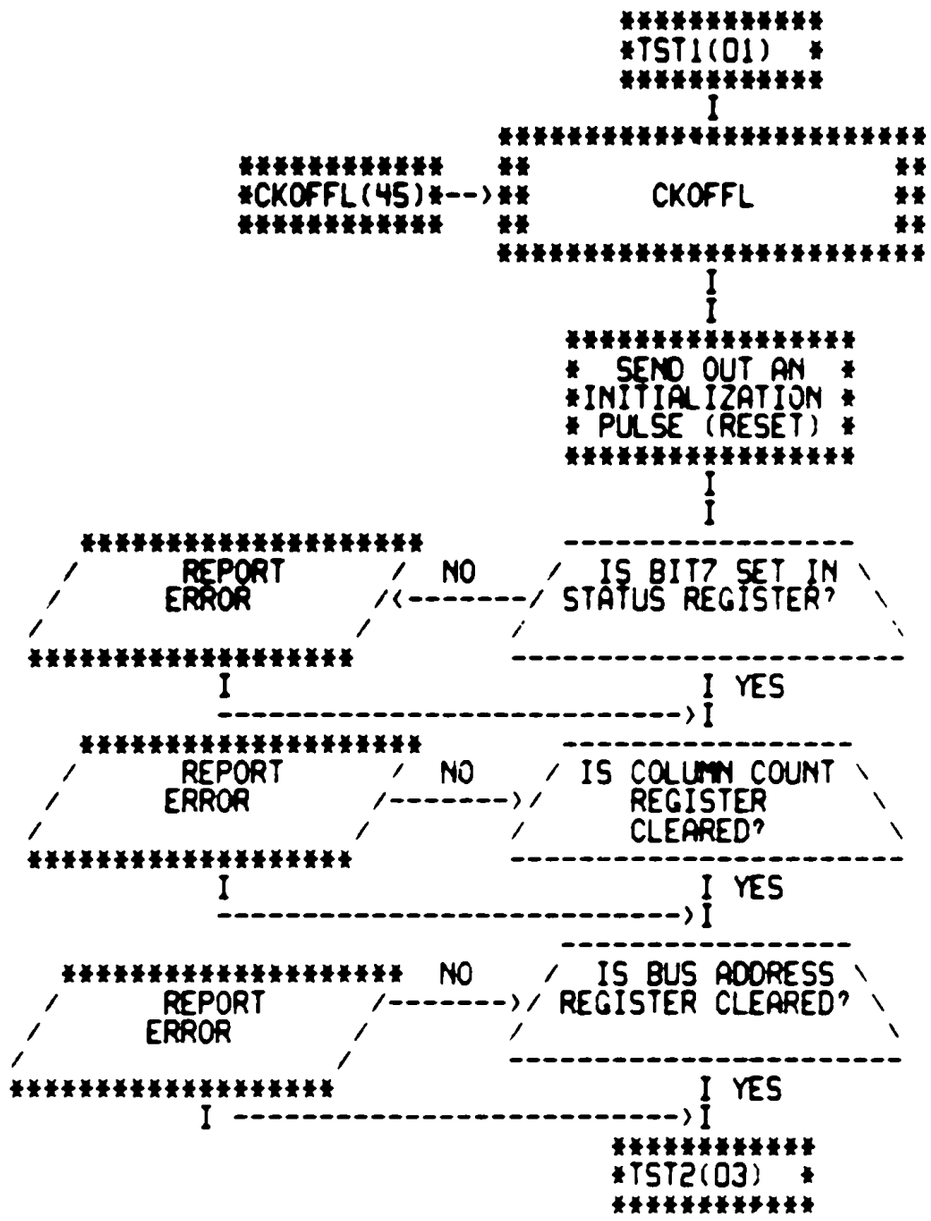
FLOW CHART
****

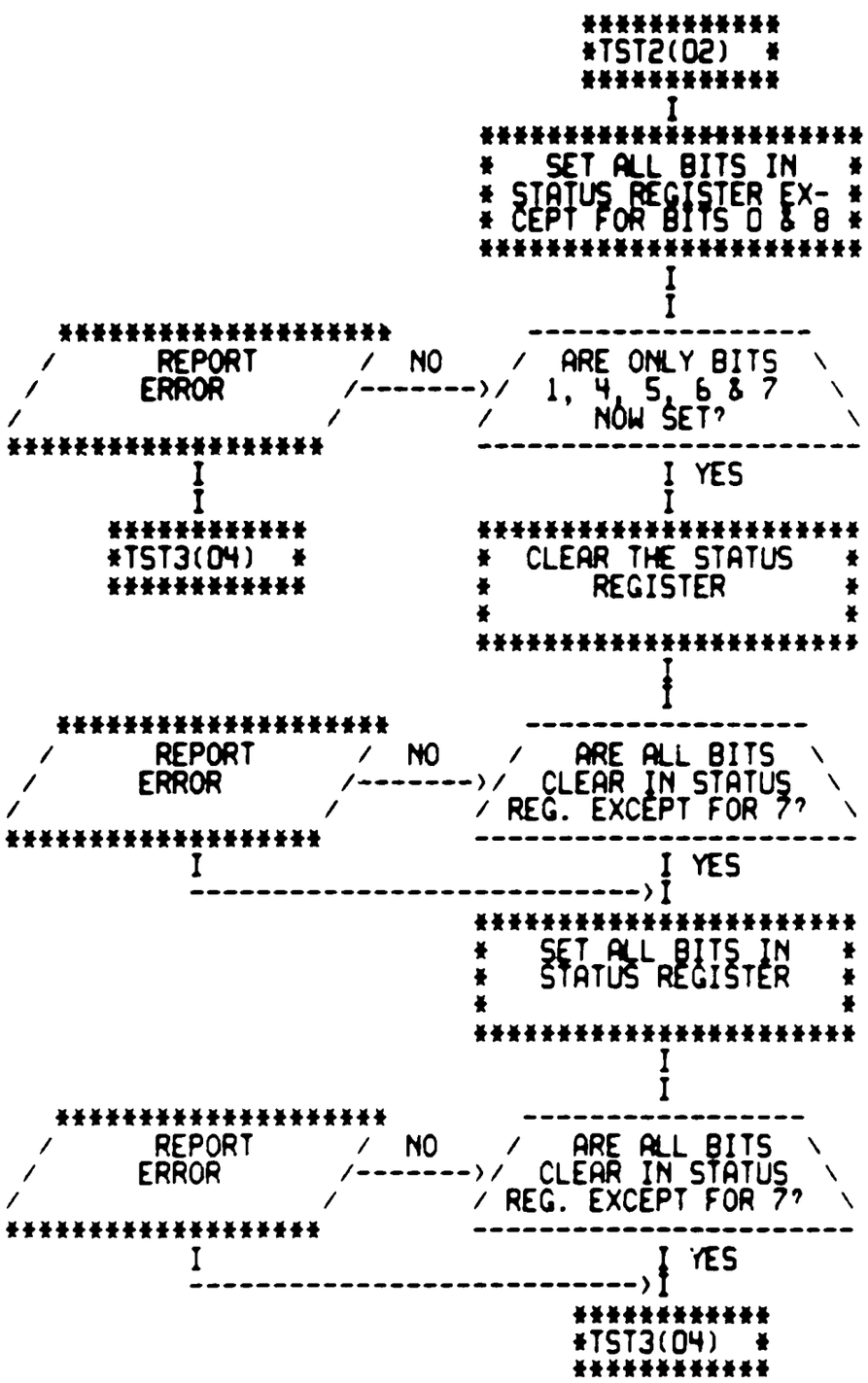
CD11/CD20 CARD READER DIAGNOSTIC

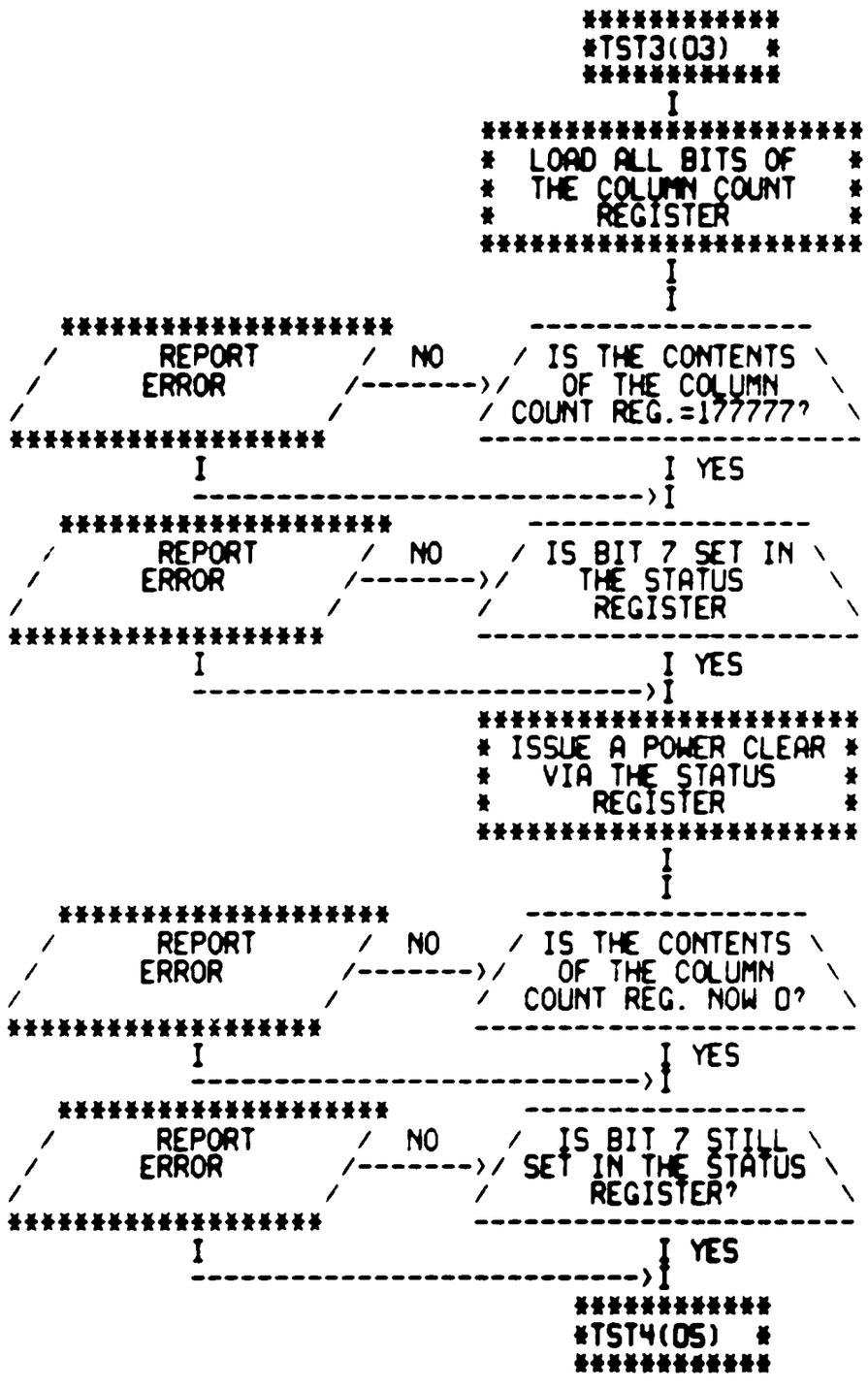
****

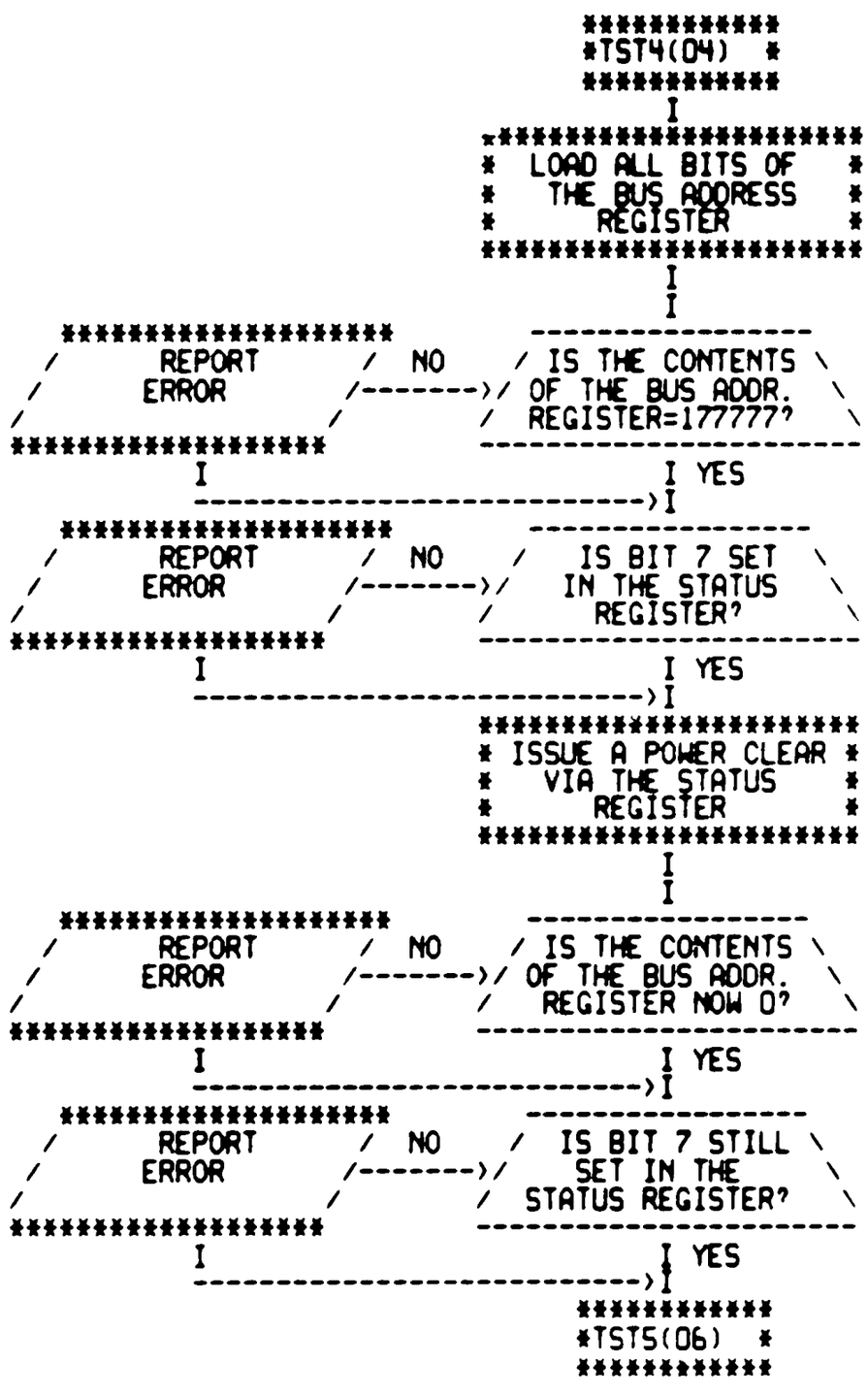
TABLE OF CONTENTS
****

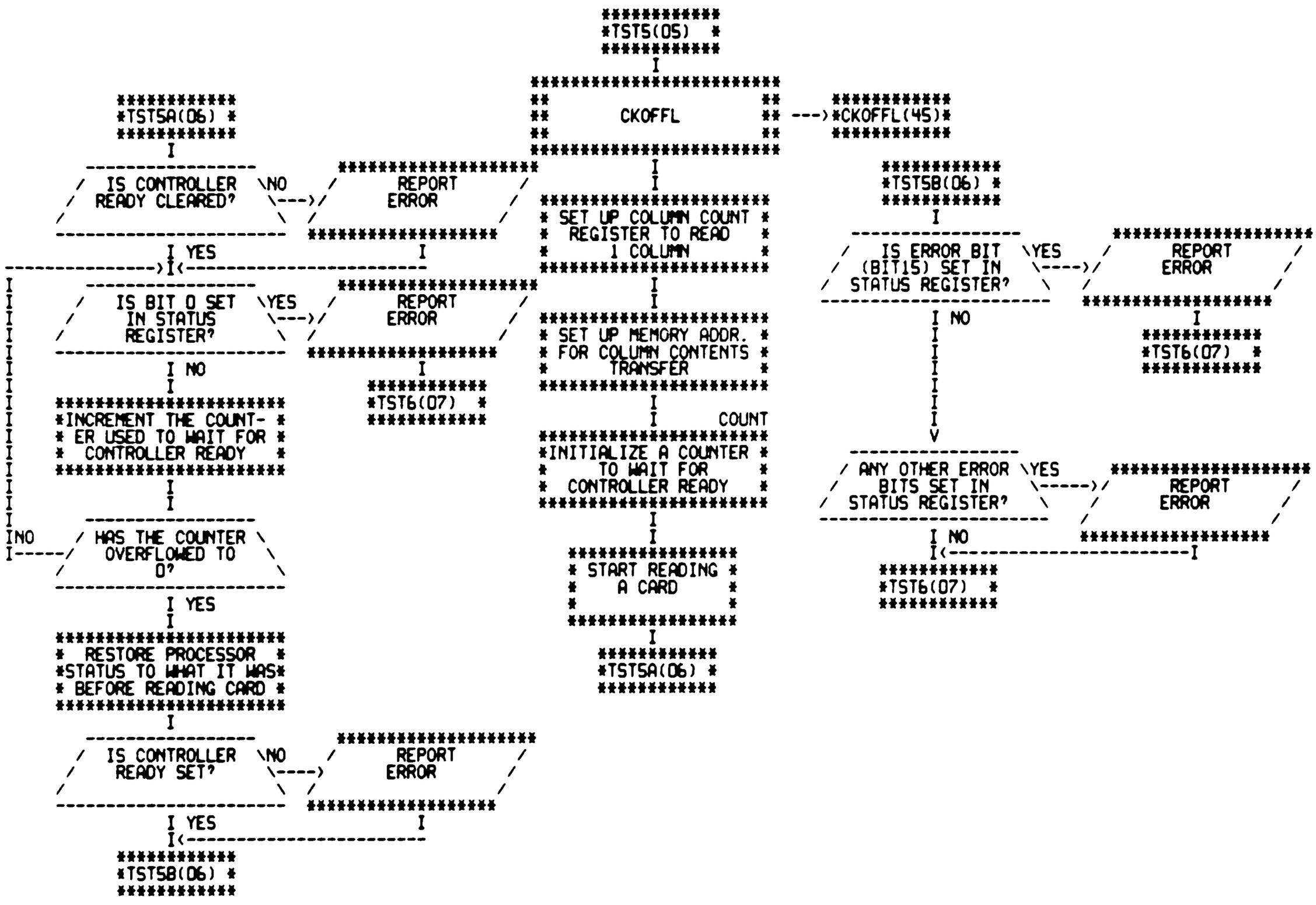

*BEGIN *
START ADDRESS = 200
VECTOR SETUPS AND
HARDWARE/SOFTWARE
"SWR" DETERMINATION
INITIALIZE
POINTERS AND
FLAGS
TYPE MAINDEC
TITLE AND
REV. LEVEL
*TST1(02) *

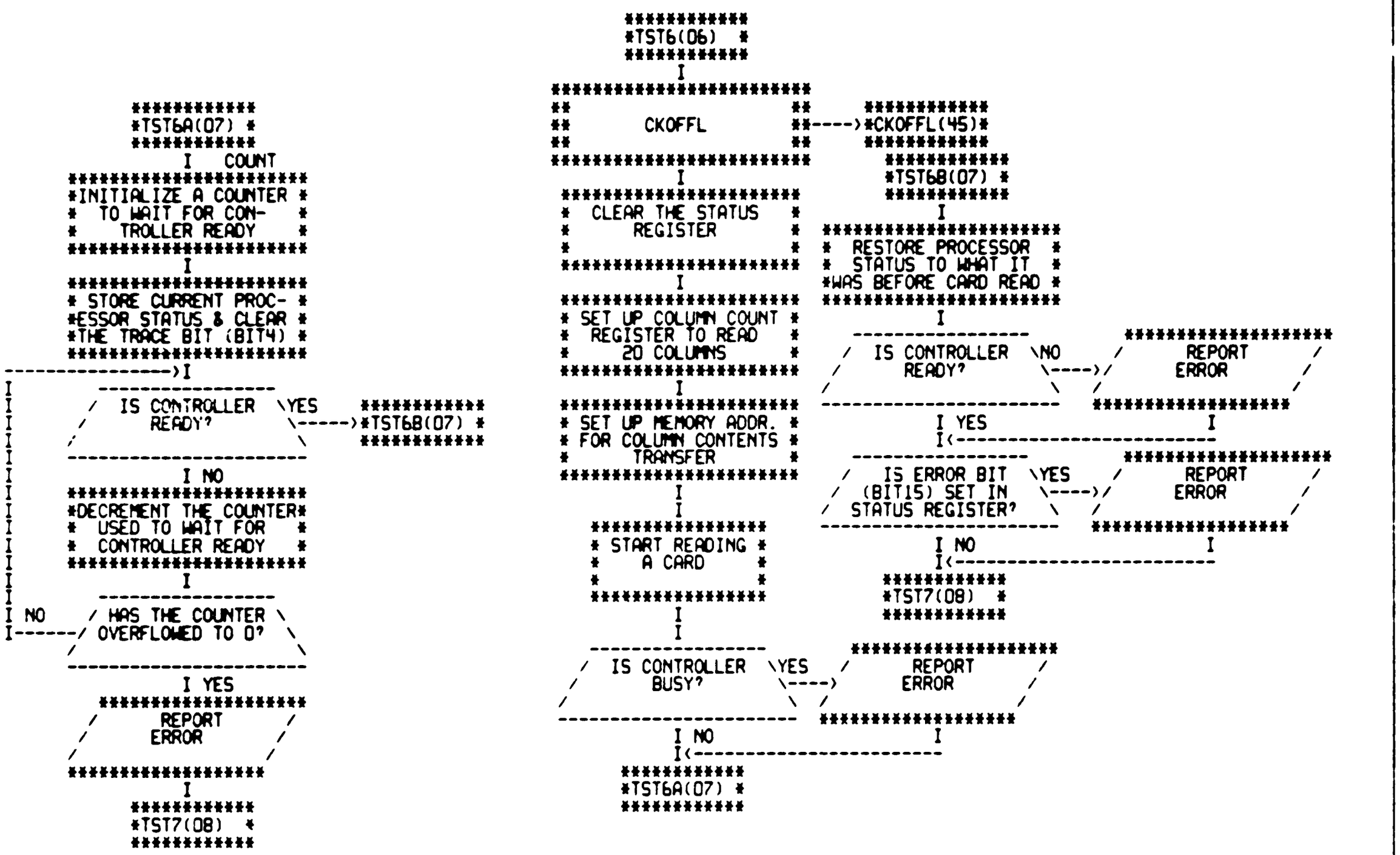

TST1(01)
CKOFFL
CKOFFL(45)
SEND OUT AN INITIALIZATION PULSE (RESET)
IS BIT7 SET IN STATUS REGISTER?
NO
YES
REPORT ERROR
IS COLUMN COUNT REGISTER CLEARED?
NO
YES
REPORT ERROR
IS BUS ADDRESS REGISTER CLEARED?
NO
YES
REPORT ERROR
TST2(03)

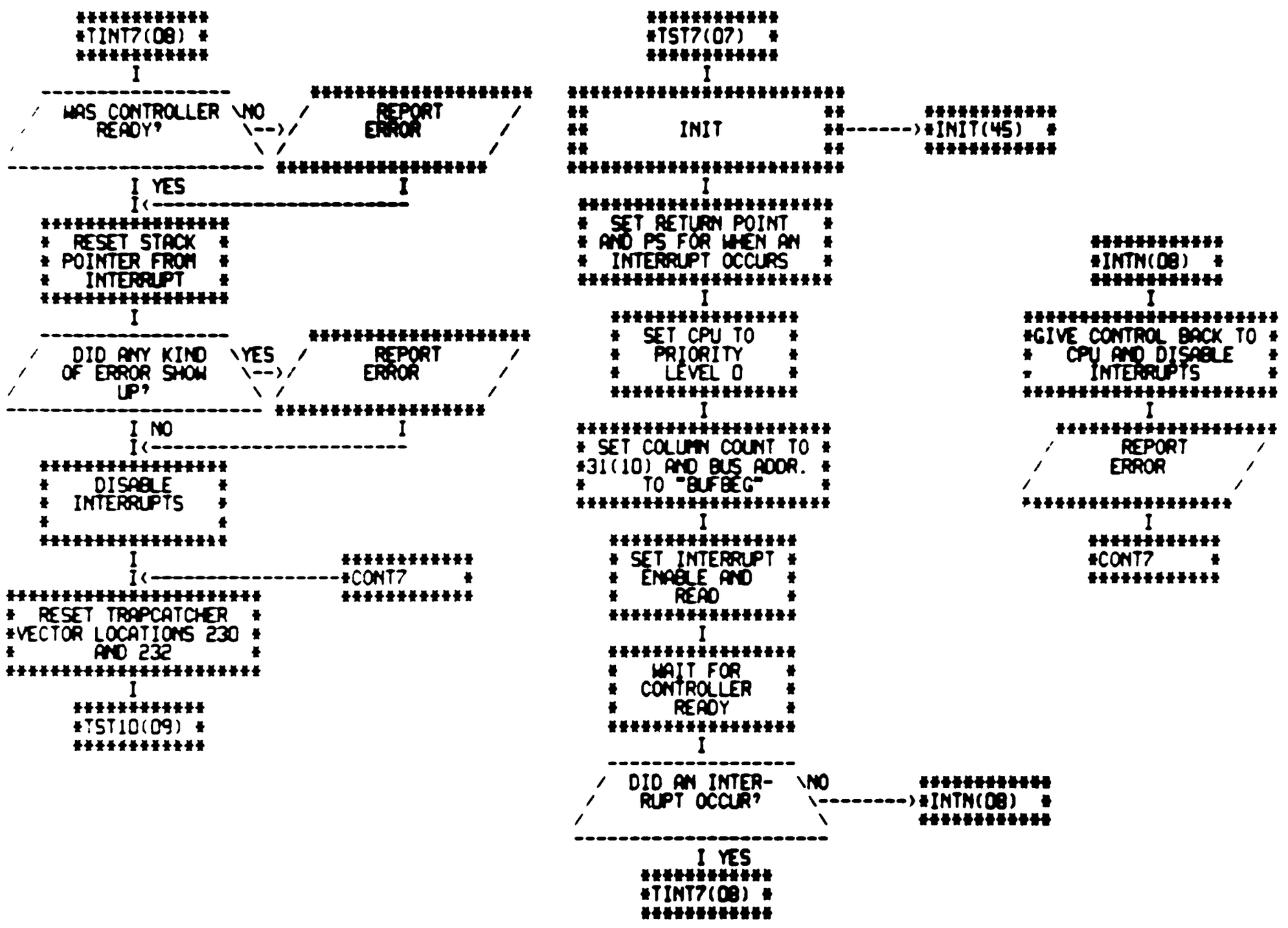

*TST2(02)
SET ALL BITS IN STATUS REGISTER EX- CEPT FOR BITS 0 & 8
ARE ONLY BITS 1, 4, 5, 6 & 7 NOW SET?
NO
REPORT ERROR
*TST3(04)
YES
CLEAR THE STATUS REGISTER
ARE ALL BITS CLEAR IN STATUS REG. EXCEPT FOR 7?
NO
REPORT ERROR
YES
SET ALL BITS IN STATUS REGISTER
ARE ALL BITS CLEAR IN STATUS REG. EXCEPT FOR 7?
NO
REPORT ERROR
YES
*TST3(04)

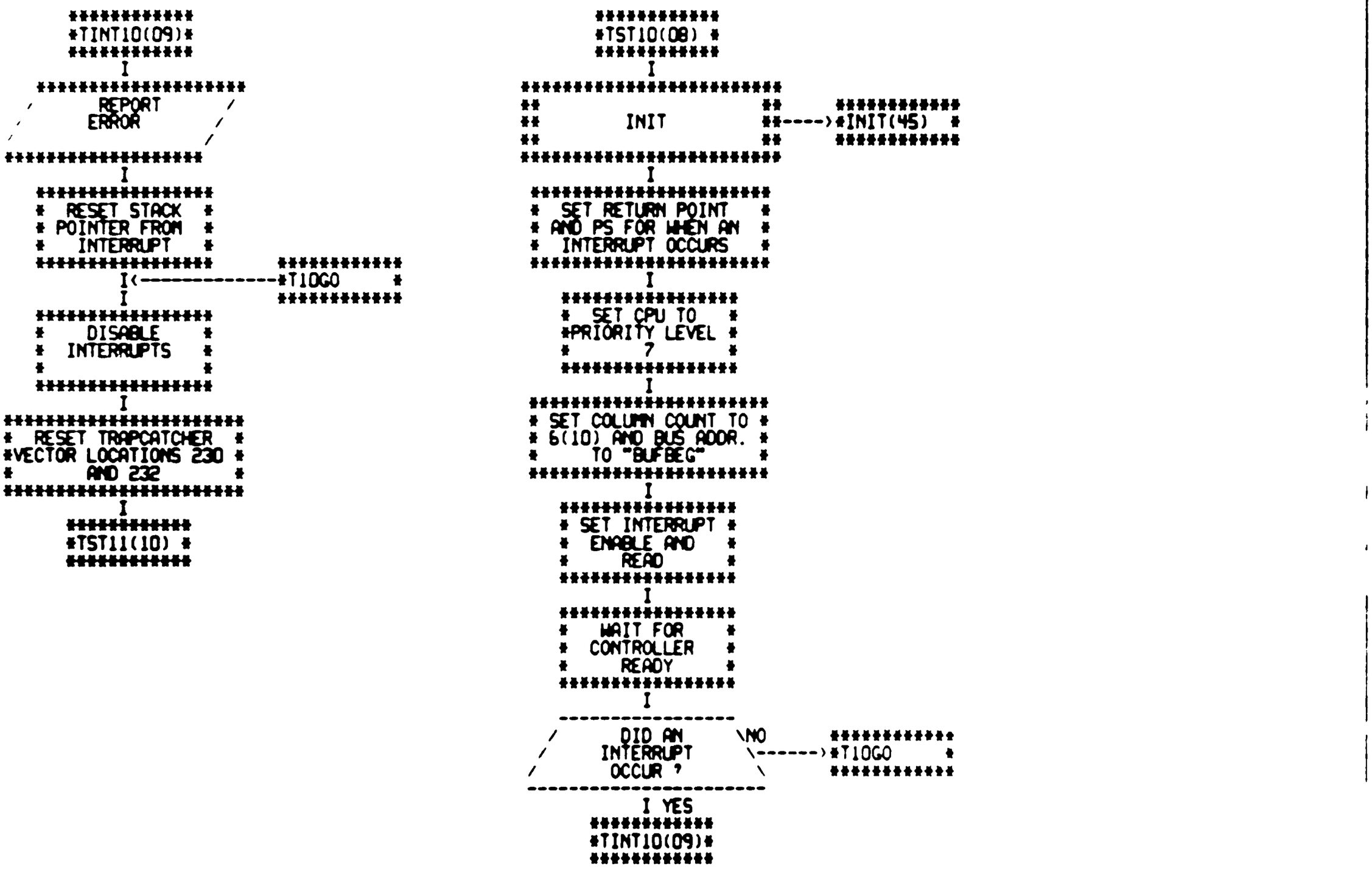

*TST3(03)
LOAD ALL BITS OF THE COLUMN COUNT REGISTER
IS THE CONTENTS OF THE COLUMN COUNT REG.=177777?
NO
REPORT ERROR
YES
IS BIT 7 SET IN THE STATUS REGISTER
NO
REPORT ERROR
YES
ISSUE A POWER CLEAR VIA THE STATUS REGISTER
IS THE CONTENTS OF THE COLUMN COUNT REG. NOW 0?
NO
REPORT ERROR
YES
IS BIT 7 STILL SET IN THE STATUS REGISTER?
NO
REPORT ERROR
YES
*TST4(05)

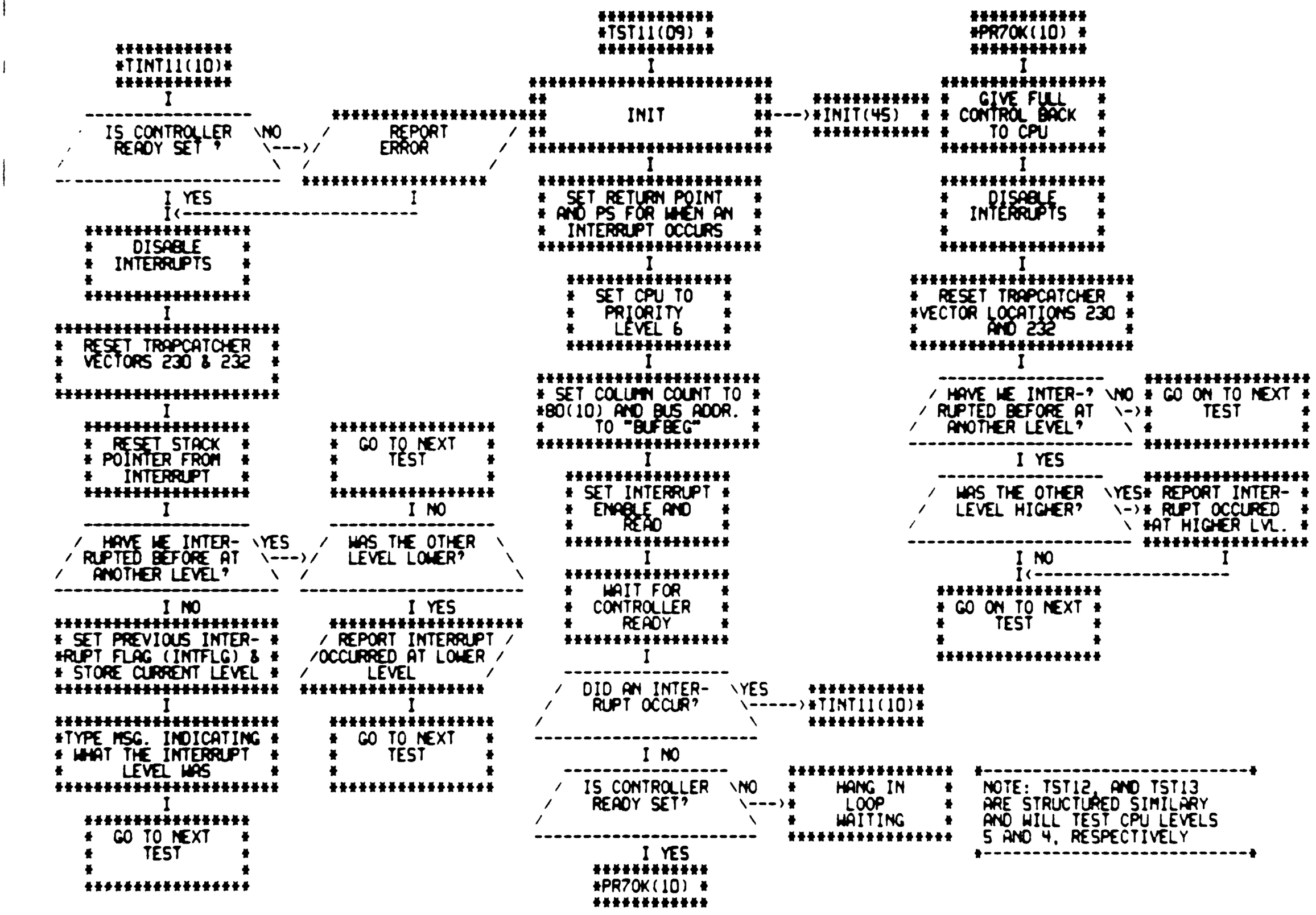

TST4(04)
LOAD ALL BITS OF THE BUS ADDRESS REGISTER
IS THE CONTENTS OF THE BUS ADDR. REGISTER=177777?
NO
REPORT ERROR
YES
IS BIT 7 SET IN THE STATUS REGISTER?
NO
REPORT ERROR
YES
ISSUE A POWER CLEAR VIA THE STATUS REGISTER
IS THE CONTENTS OF THE BUS ADDR. REGISTER NOW 0?
NO
REPORT ERROR
YES
IS BIT 7 STILL SET IN THE STATUS REGISTER?
NO
REPORT ERROR
YES
TST5(06)


*TST5(05) *
CKOFFL
CKOFFL(45)
*TST5A(06) *
IS CONTROLLER READY CLEARED?
NO
REPORT ERROR
YES
* SET UP COLUMN COUNT REGISTER TO READ 1 COLUMN *
*TST5B(06) *
IS ERROR BIT (BIT15) SET IN STATUS REGISTER?
YES
REPORT ERROR
NO
*TST6(07) *
IS BIT 0 SET IN STATUS REGISTER?
YES
REPORT ERROR
NO
*TST6(07) *
* SET UP MEMORY ADDR. FOR COLUMN CONTENTS TRANSFER *
COUNT
*INCREMENT THE COUNTER USED TO WAIT FOR CONTROLLER READY *
*INITIALIZE A COUNTER TO WAIT FOR CONTROLLER READY *
ANY OTHER ERROR BITS SET IN STATUS REGISTER?
YES
REPORT ERROR
NO
HAS THE COUNTER OVERFLOWED TO 0?
NO
* START READING A CARD *
*TST5A(06) *
YES
* RESTORE PROCESSOR STATUS TO WHAT IT WAS BEFORE READING CARD *
IS CONTROLLER READY SET?
NO
REPORT ERROR
YES
*TST5B(06) *


*TST6(06) *
CKOFFL
CKOFFL(45)
*TST6B(07) *
* RESTORE PROCESSOR *
* STATUS TO WHAT IT *
*WAS BEFORE CARD READ *
IS CONTROLLER READY?
NO
REPORT ERROR
YES
IS ERROR BIT (BIT15) SET IN STATUS REGISTER?
YES
REPORT ERROR
NO
*TST7(08) *
* CLEAR THE STATUS REGISTER *
* SET UP COLUMN COUNT REGISTER TO READ 20 COLUMNS *
* SET UP MEMORY ADDR. FOR COLUMN CONTENTS TRANSFER *
* START READING A CARD *
IS CONTROLLER BUSY?
YES
REPORT ERROR
NO
*TST6A(07) *
*TST6A(07) *
* INITIALIZE A COUNTER TO WAIT FOR CONTROLLER READY *
* STORE CURRENT PROCESSOR STATUS & CLEAR THE TRACE BIT (BIT4) *
IS CONTROLLER READY?
YES
*TST6B(07) *
NO
DECREMENT THE COUNTER USED TO WAIT FOR CONTROLLER READY
HAS THE COUNTER OVERFLOWED TO 0?
NO
YES
REPORT ERROR
*TST7(08) *


*TINT7(08) *
WAS CONTROLLER READY?
NO
REPORT ERROR
I YES
RESET STACK POINTER FROM INTERRUPT
DID ANY KIND OF ERROR SHOW UP?
YES
REPORT ERROR
I NO
DISABLE INTERRUPTS
*CONT7 *
RESET TRAPCATCHER VECTOR LOCATIONS 230 AND 232
*TST10(09) *
*TST7(07) *
INIT
*INIT(45) *
SET RETURN POINT AND PS FOR WHEN AN INTERRUPT OCCURS
SET CPU TO PRIORITY LEVEL 0
SET COLUMN COUNT TO #31(10) AND BUS ADDR. TO "BUFBEG"
SET INTERRUPT ENABLE AND READ
WAIT FOR CONTROLLER READY
DID AN INTERRUPT OCCUR?
NO
*INTN(08) *
I YES
*TINT7(08) *
*INTN(08) *
GIVE CONTROL BACK TO CPU AND DISABLE INTERRUPTS
REPORT ERROR
*CONT7 *

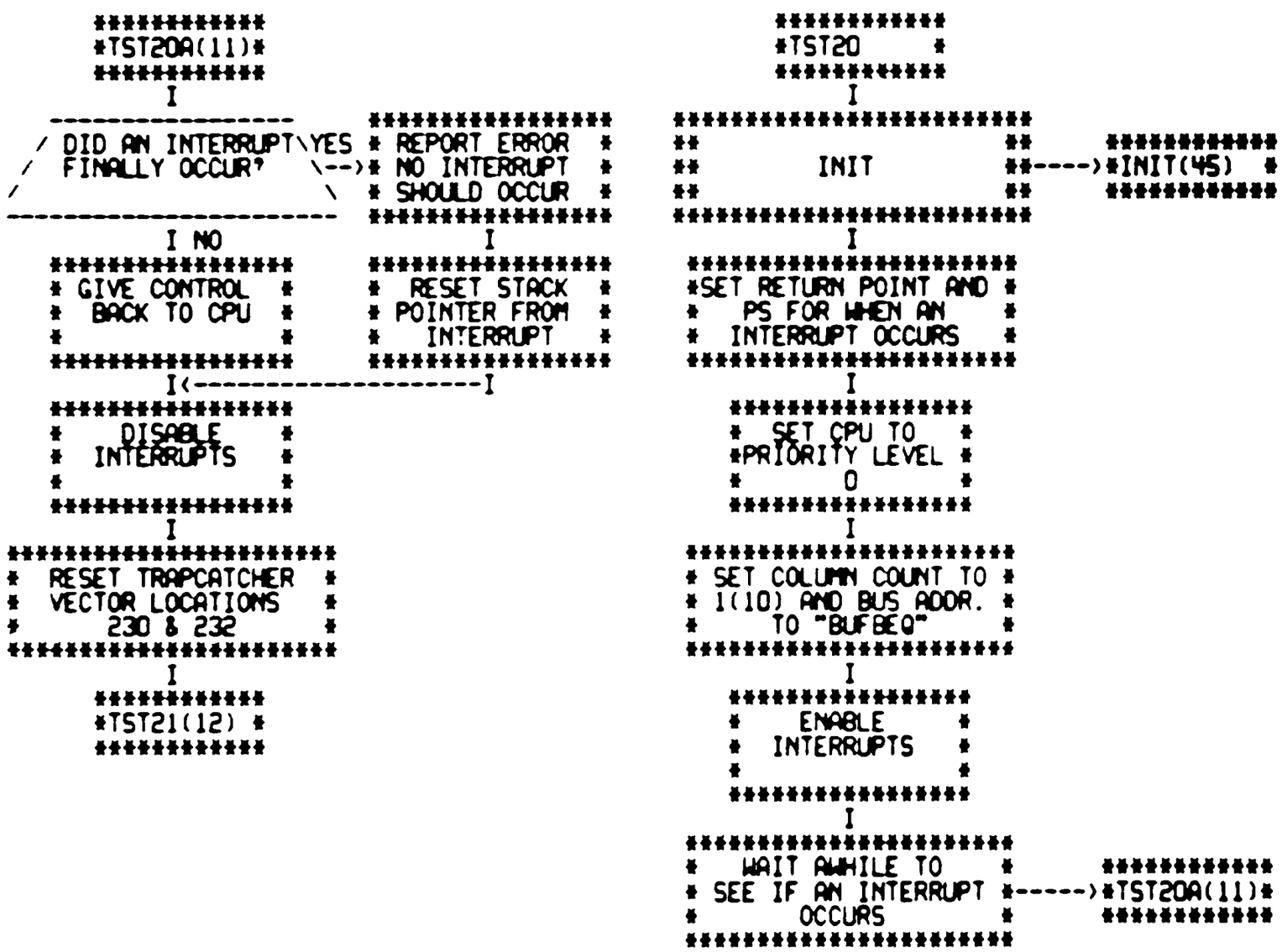

TINT10(09)
REPORT ERROR
RESET STACK POINTER FROM INTERRUPT
*T10GO
DISABLE INTERRUPTS
RESET TRAPCATCHER VECTOR LOCATIONS 230 AND 232
*TST11(10)
*TST10(08)
INIT
*INIT(45)
SET RETURN POINT AND PS FOR WHEN AN INTERRUPT OCCURS
SET CPU TO PRIORITY LEVEL 7
SET COLUMN COUNT TO 6(10) AND BUS ADDR. TO "BUFBEG"
SET INTERRUPT ENABLE AND READ
WAIT FOR CONTROLLER READY
DID AN INTERRUPT OCCUR ?
NO
YES


TINT11(10)
IS CONTROLLER READY SET ?
NO
REPORT ERROR
YES
DISABLE INTERRUPTS
RESET TRAPCATCHER VECTORS 230 & 232
RESET STACK POINTER FROM INTERRUPT
HAVE WE INTER-RUPTED BEFORE AT ANOTHER LEVEL?
YES
WAS THE OTHER LEVEL LOWER?
GO TO NEXT TEST
NO
REPORT INTERRUPT OCCURRED AT LOWER LEVEL
SET PREVIOUS INTER-RUPT FLAG (INTFLG) & STORE CURRENT LEVEL
TYPE MSG. INDICATING WHAT THE INTERRUPT LEVEL WAS
*TST11(09) *
INIT
*INIT(45) *
SET RETURN POINT AND PS FOR WHEN AN INTERRUPT OCCURS
SET CPU TO PRIORITY LEVEL 6
SET COLUMN COUNT TO *80(10) AND BUS ADDR. TO "BUFBEG"
SET INTERRUPT ENABLE AND READ
WAIT FOR CONTROLLER READY
DID AN INTER-RUPT OCCUR?
TINT11(10)
IS CONTROLLER READY SET?
HANG IN LOOP WAITING
*PR70K(10) *
*PR70K(10) *
GIVE FULL CONTROL BACK TO CPU
DISABLE INTERRUPTS
RESET TRAPCATCHER *VECTOR LOCATIONS 230 AND 232
HAVE WE INTER-RUPTED BEFORE AT ANOTHER LEVEL?
WAS THE OTHER LEVEL HIGHER?
REPORT INTER-RUPT OCCURED *AT HIGHER LVL.
GO ON TO NEXT TEST
GO ON TO NEXT TEST
NOTE: TST12, AND TST13 ARE STRUCTURED SIMILARY AND WILL TEST CPU LEVELS 5 AND 4, RESPECTIVELY

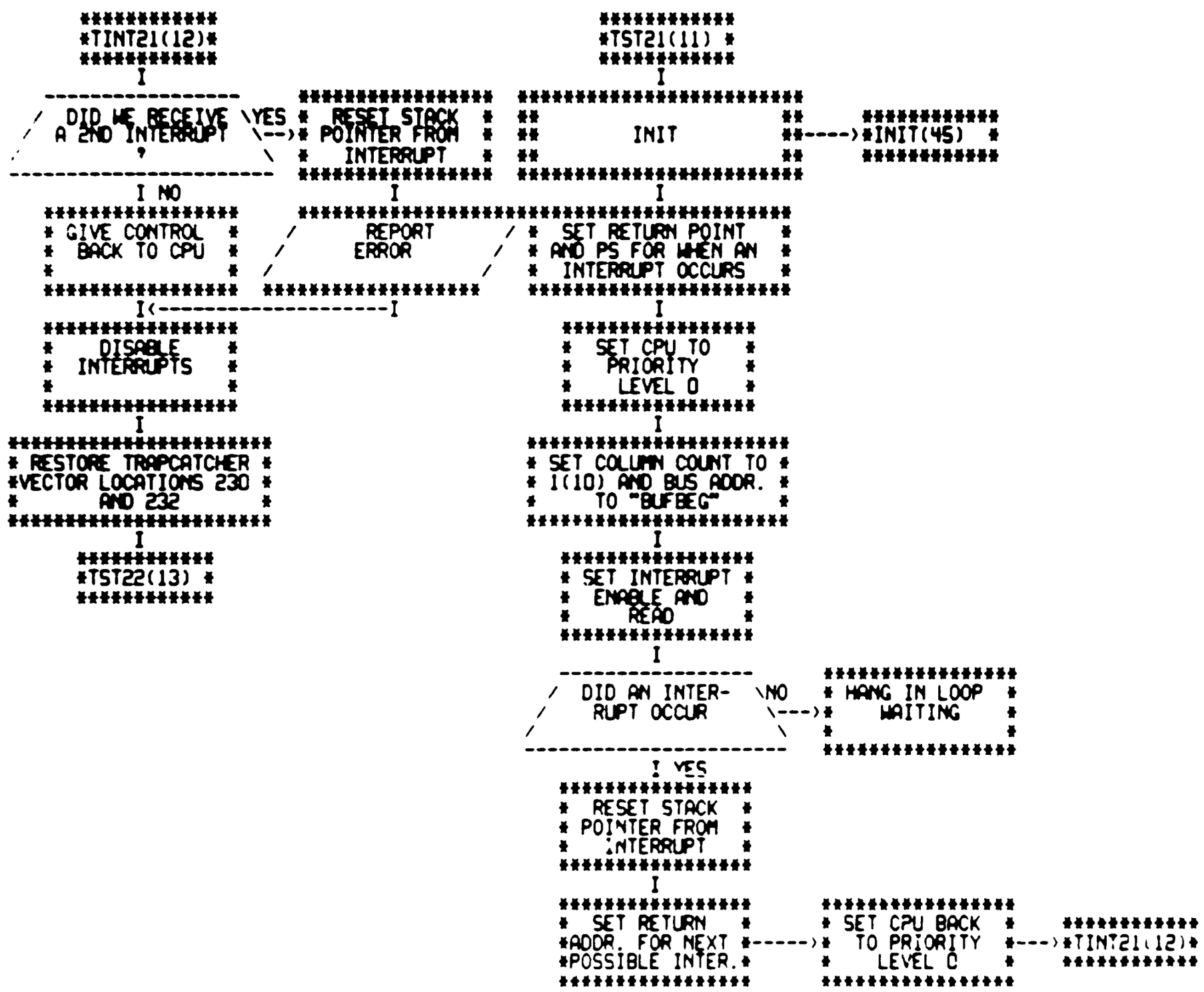
TEST 14 THRU 17 ARE STRUCTURED SIMILARLY

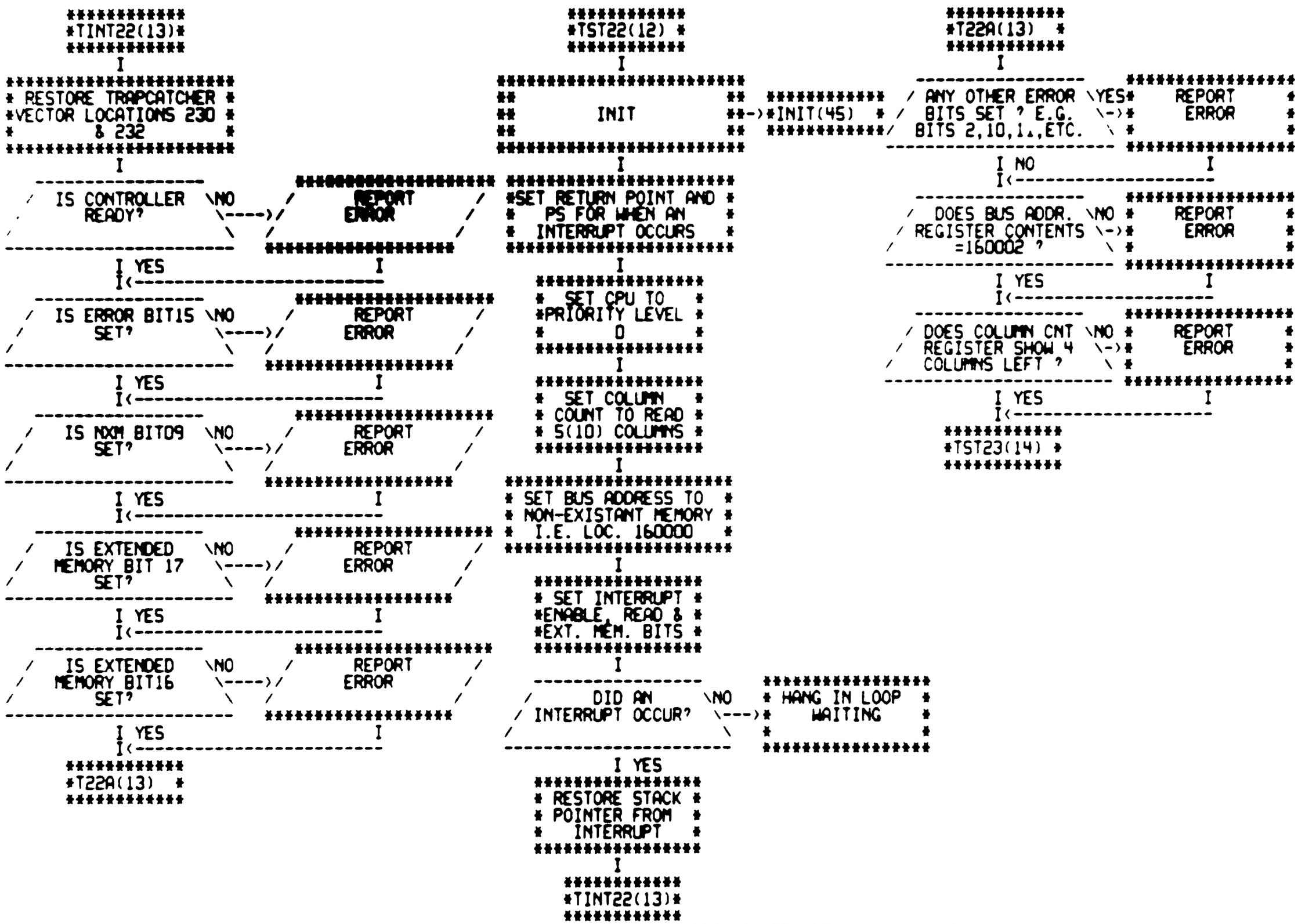
TO THAT SHOWN FOR TEST 11 *TST11(10) *

TESTS 14 THRU 17 COVER CPU LEVELS 3,2,1 AND 0;
THE ONLY DIFFERENCE BEING THAT WE ARE NOW
LOOKING FOR AN INTERRUPT TO OCCUR SINCE THE CPU
LEVELS ARE BELOW THE DEVICE LEVEL OF 4.

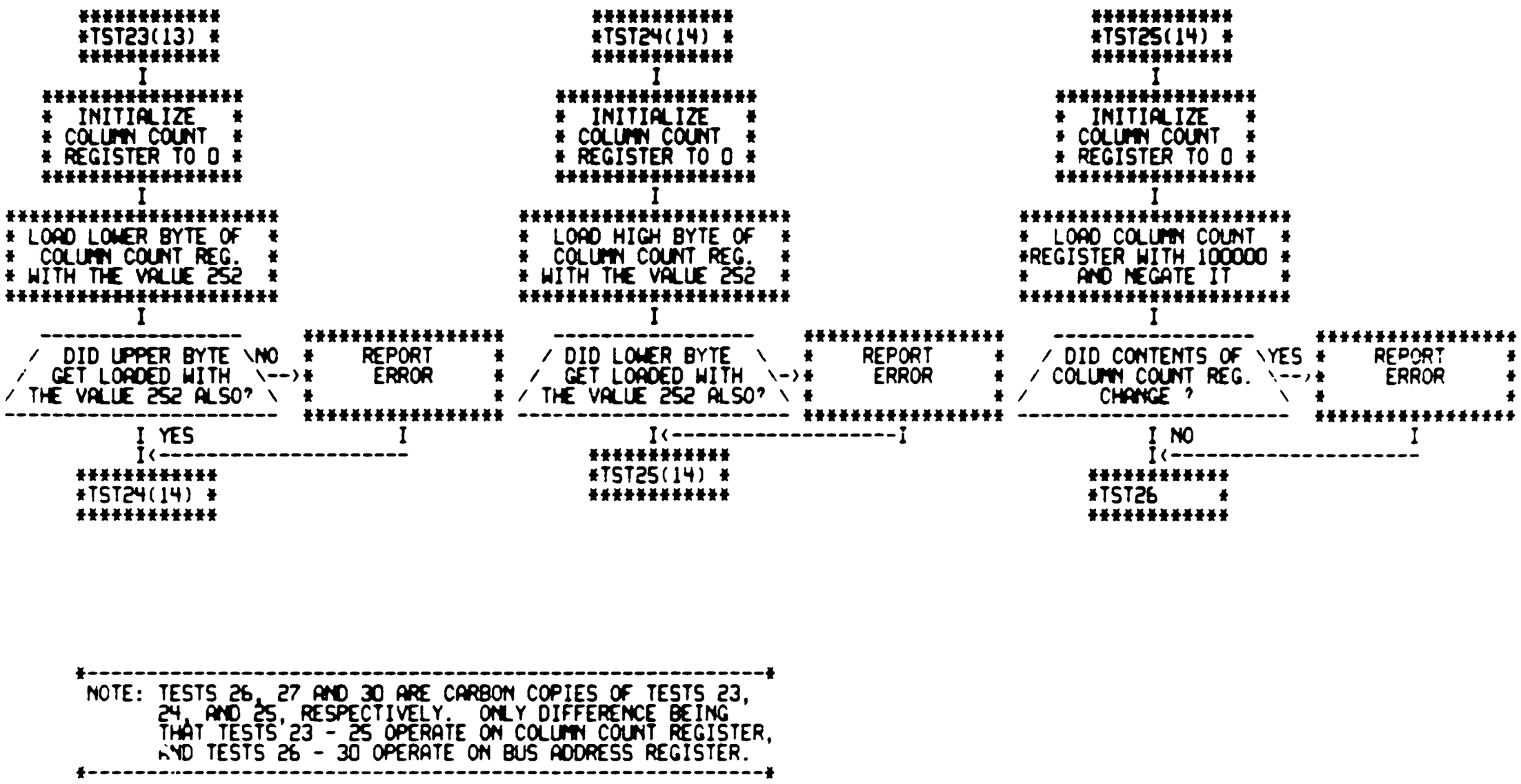


F03

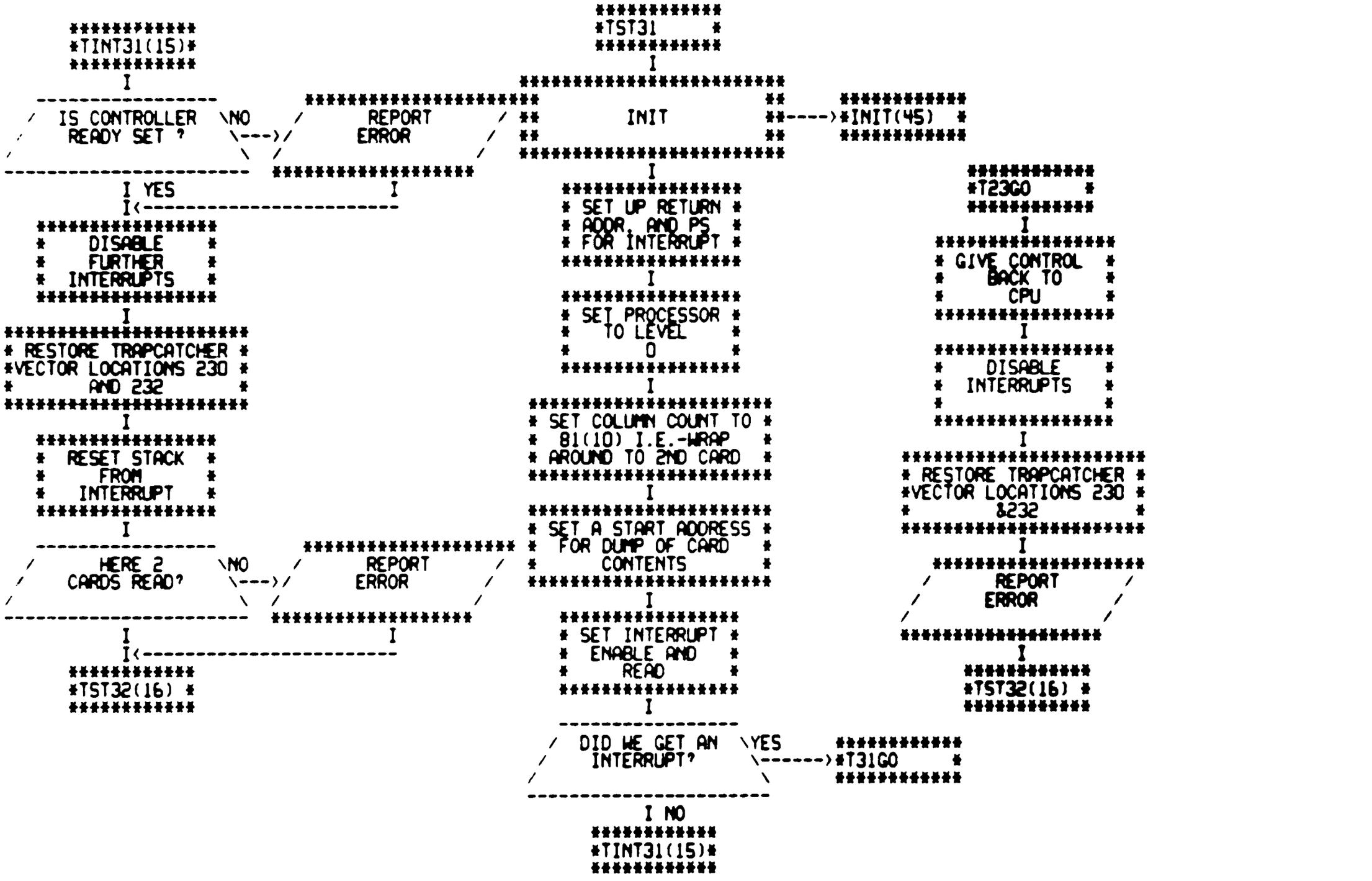

TINT21(12)
DID WE RECEIVE A 2ND INTERRUPT
YES
RESET STACK POINTER FROM INTERRUPT
NO
GIVE CONTROL BACK TO CPU
REPORT ERROR
DISABLE INTERRUPTS
RESTORE TRAPCATCHER VECTOR LOCATIONS 230 AND 232
*TST22(13) *
*TST21(11) *
INIT
*INIT(45) *
SET RETURN POINT AND PS FOR WHEN AN INTERRUPT OCCURS
SET CPU TO PRIORITY LEVEL 0
SET COLUMN COUNT TO I(10) AND BUS ADDR. TO "BUFBEG"
SET INTERRUPT ENABLE AND READ
DID AN INTERRUPT OCCUR
NO
HANG IN LOOP WAITING
YES
RESET STACK POINTER FROM INTERRUPT
SET RETURN ADDR. FOR NEXT POSSIBLE INTER.
SET CPU BACK TO PRIORITY LEVEL 0
TINT21(12)

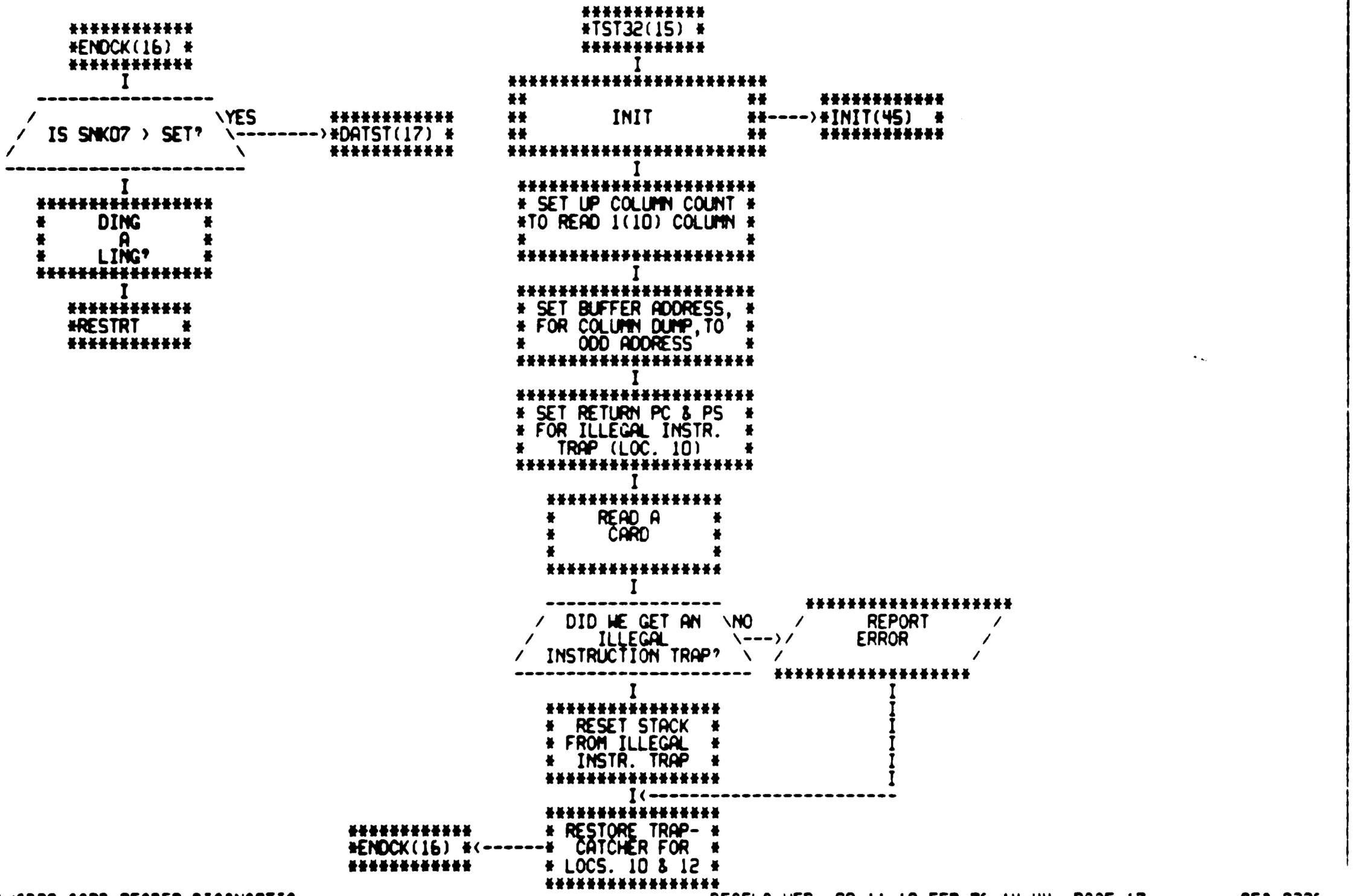

TINT22(13)
RESTORE TRAPCATCHER VECTOR LOCATIONS 230 & 232
IS CONTROLLER READY?
NO
REPORT ERROR
YES
IS ERROR BIT15 SET?
NO
REPORT ERROR
YES
IS NXM BIT09 SET?
NO
REPORT ERROR
YES
IS EXTENDED MEMORY BIT 17 SET?
NO
REPORT ERROR
YES
IS EXTENDED MEMORY BIT16 SET?
NO
REPORT ERROR
YES
*T22A(13) *
*TST22(12) *
INIT
*INIT(45) *
SET RETURN POINT AND PS FOR WHEN AN INTERRUPT OCCURS
SET CPU TO PRIORITY LEVEL 0
SET COLUMN COUNT TO READ 5(10) COLUMNS
SET BUS ADDRESS TO NON-EXISTANT MEMORY I.E. LOC. 160000
SET INTERRUPT ENABLE, READ & EXT. MEM. BITS
DID AN INTERRUPT OCCUR?
NO
HANG IN LOOP WAITING
YES
RESTORE STACK POINTER FROM INTERRUPT
TINT22(13)
*T22A(13) *
ANY OTHER ERROR BITS SET ? E.G. BITS 2,10,14,ETC.
YES
REPORT ERROR
NO
DOES BUS ADDR. REGISTER CONTENTS =160002 ?
NO
REPORT ERROR
YES
DOES COLUMN CNT REGISTER SHOW 4 COLUMNS LEFT ?
NO
REPORT ERROR
YES
*TST23(14) *

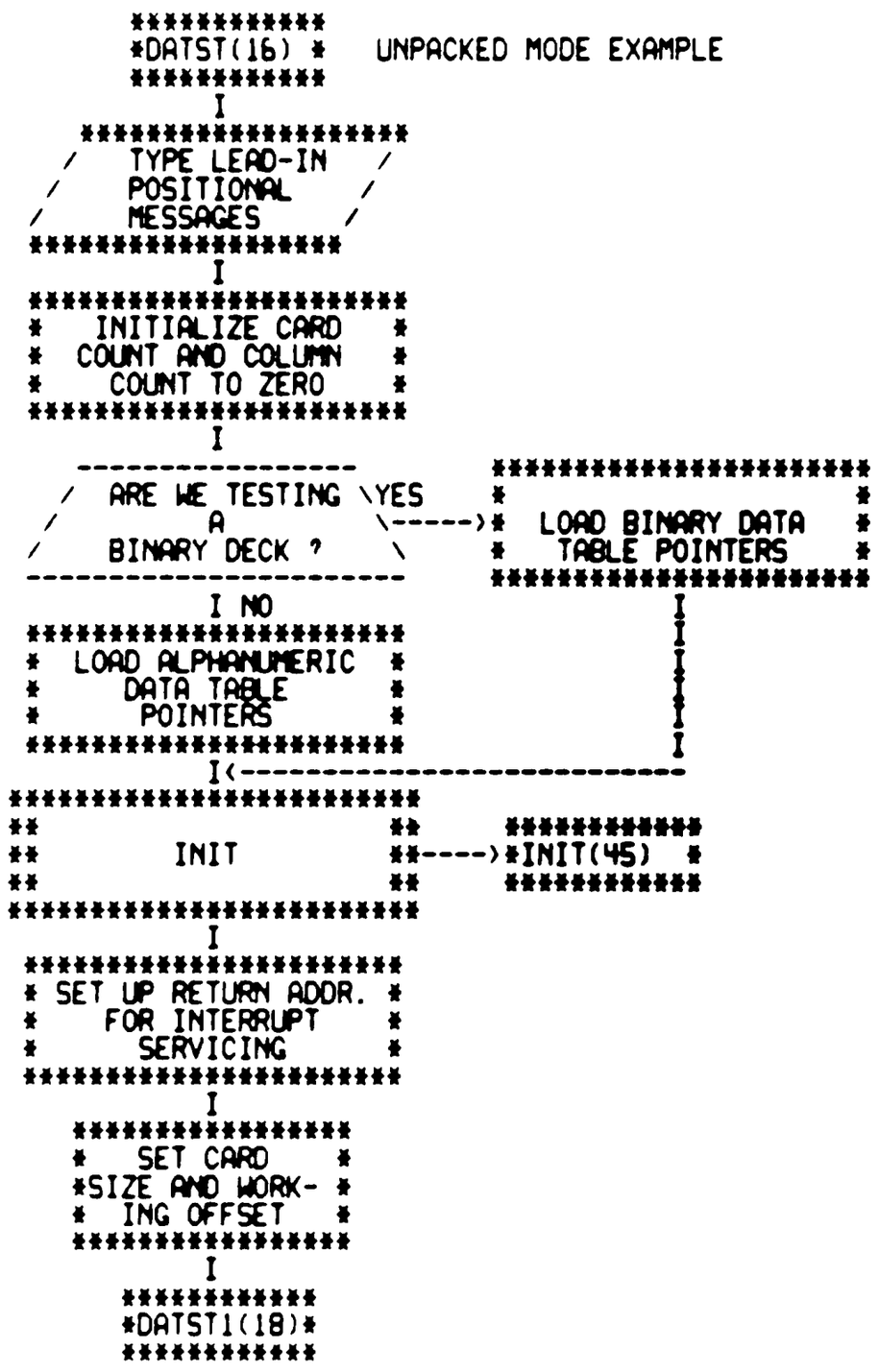
H03

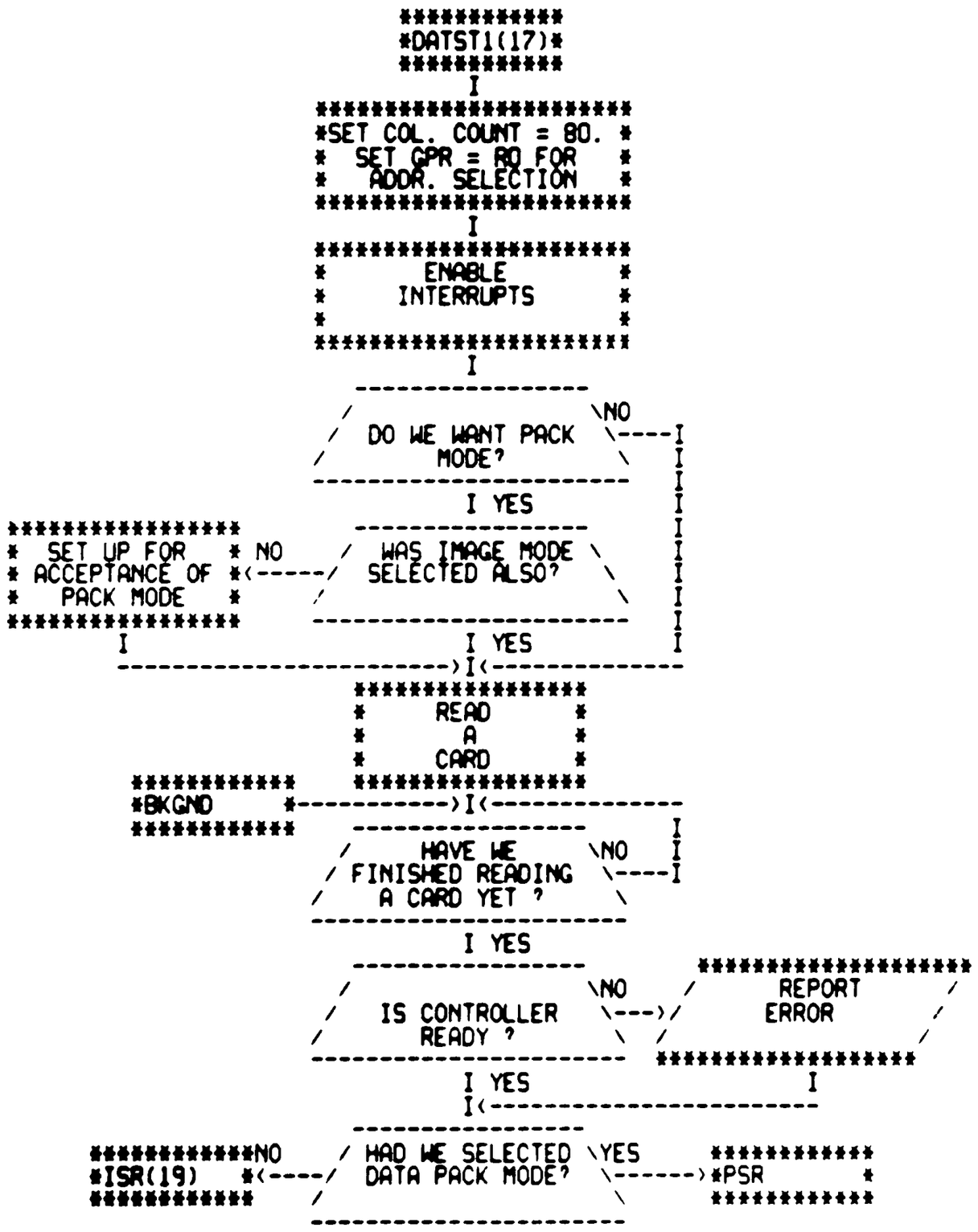


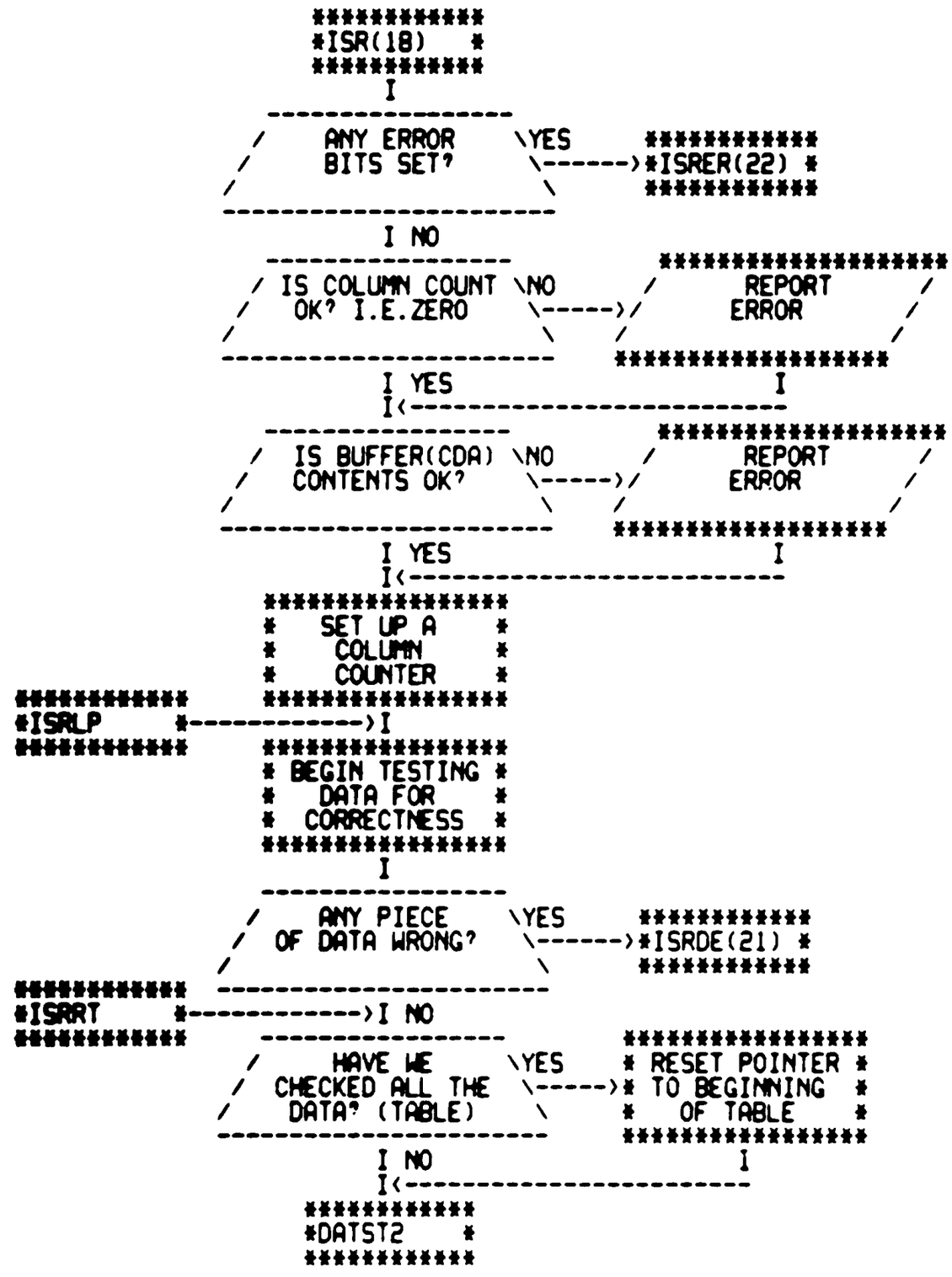
NOTE: TESTS 26, 27 AND 30 ARE CARBON COPIES OF TESTS 23, 24, AND 25, RESPECTIVELY. ONLY DIFFERENCE BEING THAT TESTS 23 - 25 OPERATE ON COLUMN COUNT REGISTER, AND TESTS 26 - 30 OPERATE ON BUS ADDRESS REGISTER.

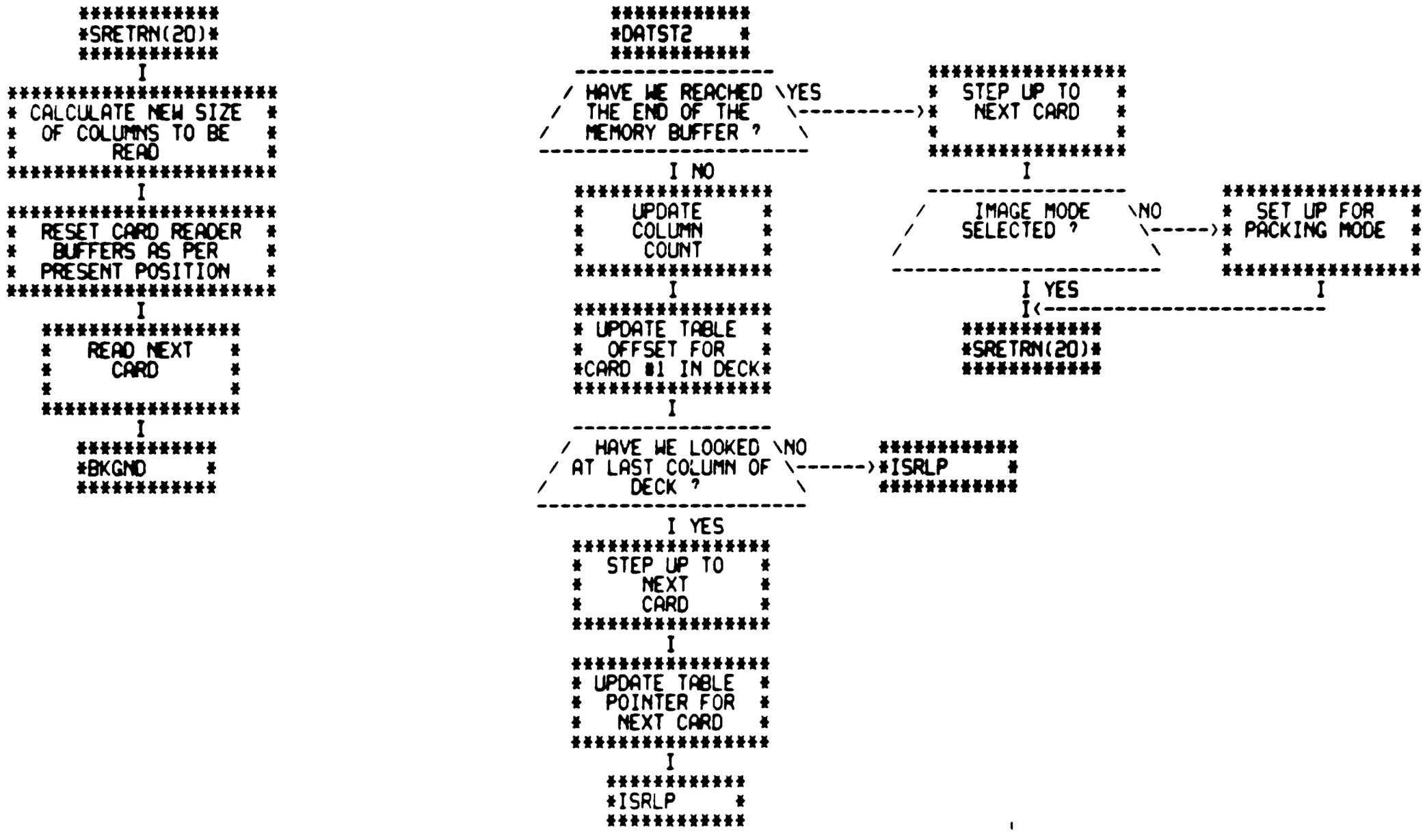

TINT31(15)
IS CONTROLLER READY SET ?
NO
REPORT ERROR
YES
DISABLE FURTHER INTERRUPTS
RESTORE TRAPCATCHER VECTOR LOCATIONS 230 AND 232
RESET STACK FROM INTERRUPT
HERE 2 CARDS READ?
NO
REPORT ERROR
*TST32(16) *
*TST31 *
INIT
*INIT(45) *
SET UP RETURN ADDR. AND PS FOR INTERRUPT
SET PROCESSOR TO LEVEL 0
SET COLUMN COUNT TO 81(10) I.E.-WRAP AROUND TO 2ND CARD
SET A START ADDRESS FOR DUMP OF CARD CONTENTS
SET INTERRUPT ENABLE AND READ
DID WE GET AN INTERRUPT?
YES
*T31GO *
NO
TINT31(15)
*T23GO *
GIVE CONTROL BACK TO CPU
DISABLE INTERRUPTS
RESTORE TRAPCATCHER VECTOR LOCATIONS 230 &232
REPORT ERROR
*TST32(16) *

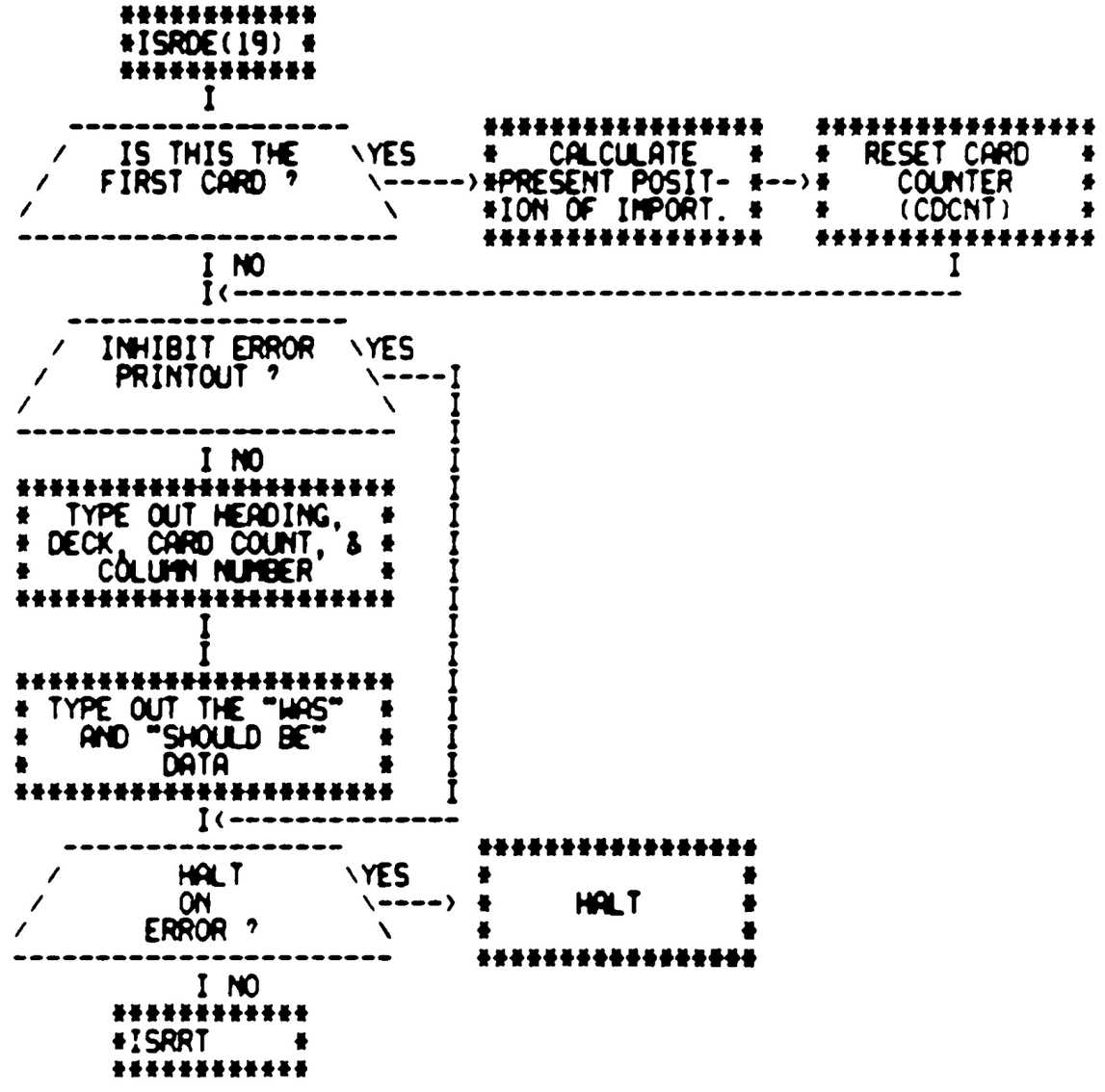

*ENDCK(16) *
IS SNK07) SET?
YES
*DATST(17) *
DING A LING?
*RESTRT *
*TST32(15) *
INIT
*INIT(45) *
* SET UP COLUMN COUNT *
*TO READ 1(10) COLUMN *
* SET BUFFER ADDRESS, *
* FOR COLUMN DUMP,TO' *
* ODD ADDRESS *
* SET RETURN PC & PS *
* FOR ILLEGAL INSTR. *
* TRAP (LOC. 10) *
READ A CARD
DID WE GET AN ILLEGAL INSTRUCTION TRAP?
NO
REPORT ERROR
RESET STACK * FROM ILLEGAL * INSTR. TRAP
* RESTORE TRAP- * CATCHER FOR * LOCS. 10 & 12 *
*ENDCK(16) *

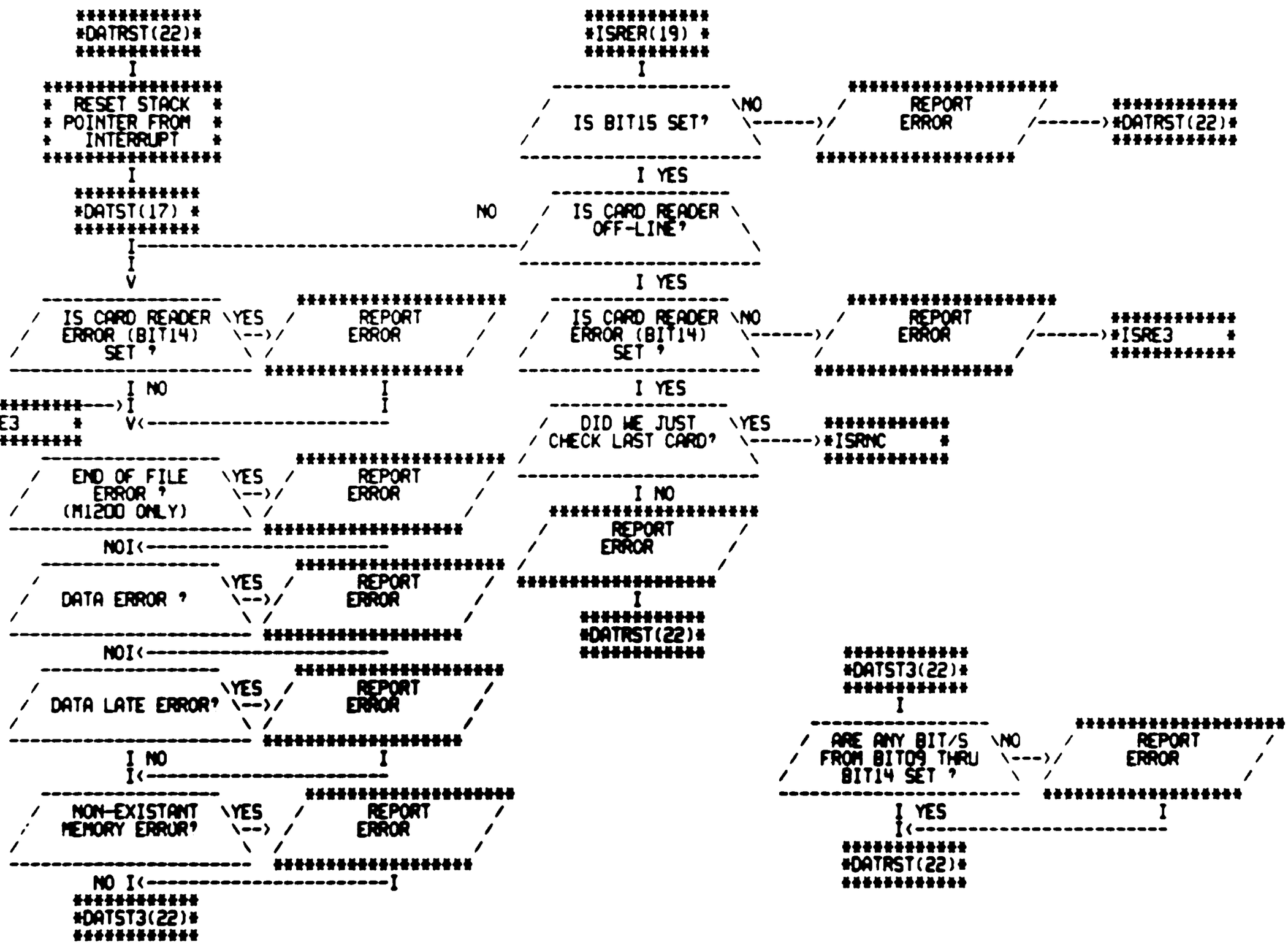

*DATST(16) *
UNPACKED MODE EXAMPLE
TYPE LEAD-IN
POSITIONAL
MESSAGES
INITIALIZE CARD
COUNT AND COLUMN
COUNT TO ZERO
ARE WE TESTING
A
BINARY DECK ?
YES
NO
LOAD BINARY DATA
TABLE POINTERS
LOAD ALPHANUMERIC
DATA TABLE
POINTERS
INIT
INIT
INIT(45)
SET UP RETURN ADDR.
FOR INTERRUPT
SERVICING
SET CARD
SIZE AND WORK-
ING OFFSET
DATST1(18)


DATST1(17)
*SET COL. COUNT = 80. *
* SET GPR = R0 FOR *
* ADDR. SELECTION *
* ENABLE *
* INTERRUPTS *
DO WE WANT PACK MODE?
NO
YES
WAS IMAGE MODE SELECTED ALSO?
NO
YES
* SET UP FOR ACCEPTANCE OF PACK MODE *
READ A CARD
*BKGND *
HAVE WE FINISHED READING A CARD YET ?
NO
YES
IS CONTROLLER READY ?
NO
REPORT ERROR
YES
HAD WE SELECTED DATA PACK MODE?
NO
YES
*ISR(19) *
*PSR *

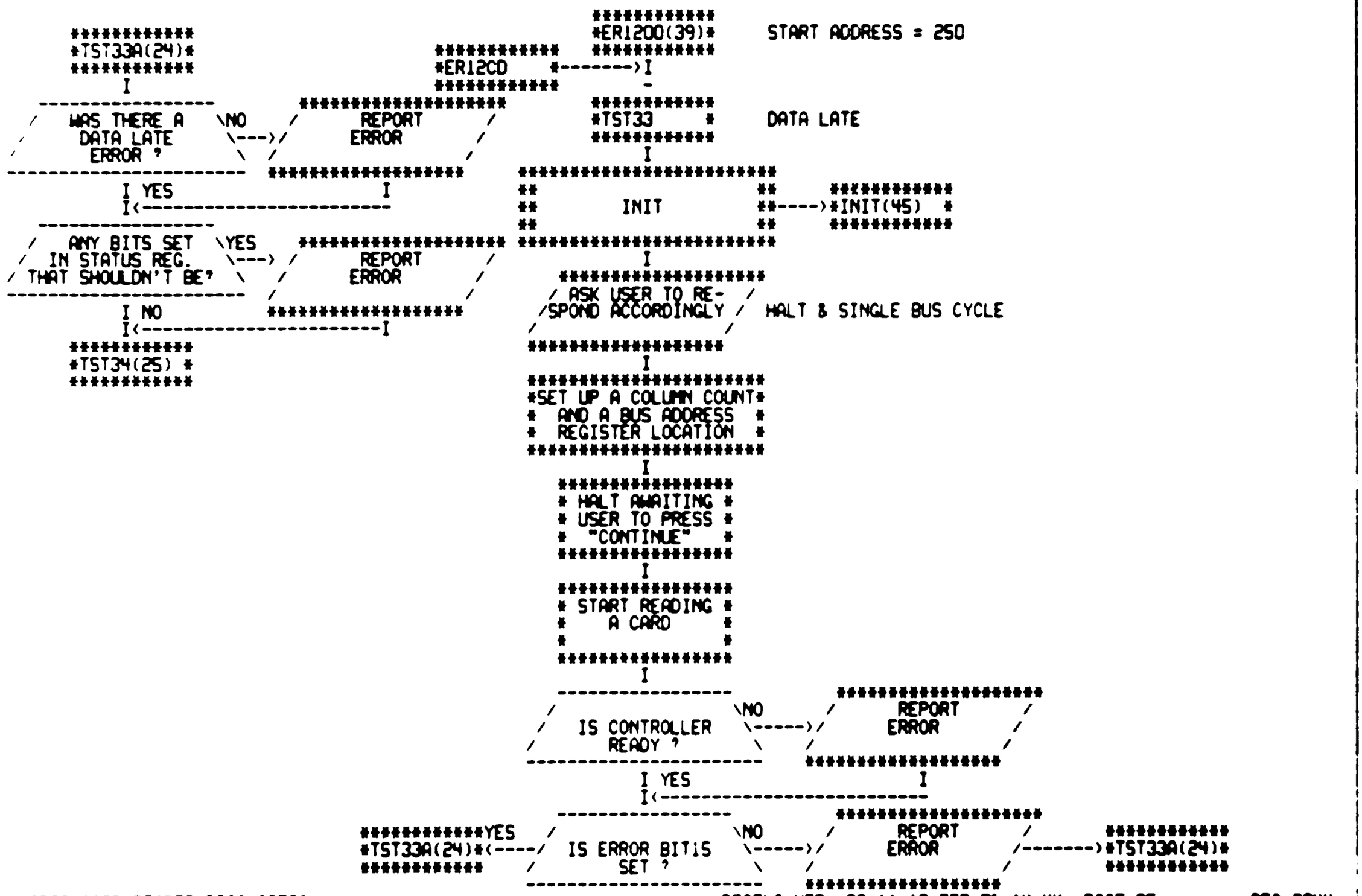

*ISR(18)
ANY ERROR BITS SET?
YES
*ISRER(22)
NO
IS COLUMN COUNT OK? I.E.ZERO
NO
REPORT ERROR
YES
IS BUFFER(CDA) CONTENTS OK?
NO
REPORT ERROR
YES
SET UP A COLUMN COUNTER
*ISRLP
BEGIN TESTING DATA FOR CORRECTNESS
ANY PIECE OF DATA WRONG?
YES
*ISRDE(21)
*ISRRT
NO
HAVE WE CHECKED ALL THE DATA? (TABLE)
YES
RESET POINTER TO BEGINNING OF TABLE
NO
*DATST2


SRETRN(20)
SRETRN(20)
CALCULATE NEW SIZE OF COLUMNS TO BE READ
RESET CARD READER BUFFERS AS PER PRESENT POSITION
READ NEXT CARD
BKGND
BKGND
DATST2
DATST2
HAVE WE REACHED THE END OF THE MEMORY BUFFER ?
YES
NO
UPDATE COLUMN COUNT
UPDATE TABLE OFFSET FOR *CARD #1 IN DECK*
HAVE WE LOOKED AT LAST COLUMN OF DECK ?
NO
YES
ISRLP
ISRLP
STEP UP TO NEXT CARD
STEP UP TO NEXT CARD
UPDATE TABLE POINTER FOR NEXT CARD
ISRLP
ISRLP
IMAGE MODE SELECTED ?
NO
YES
SET UP FOR PACKING MODE
SRETRN(20)
SRETRN(20)

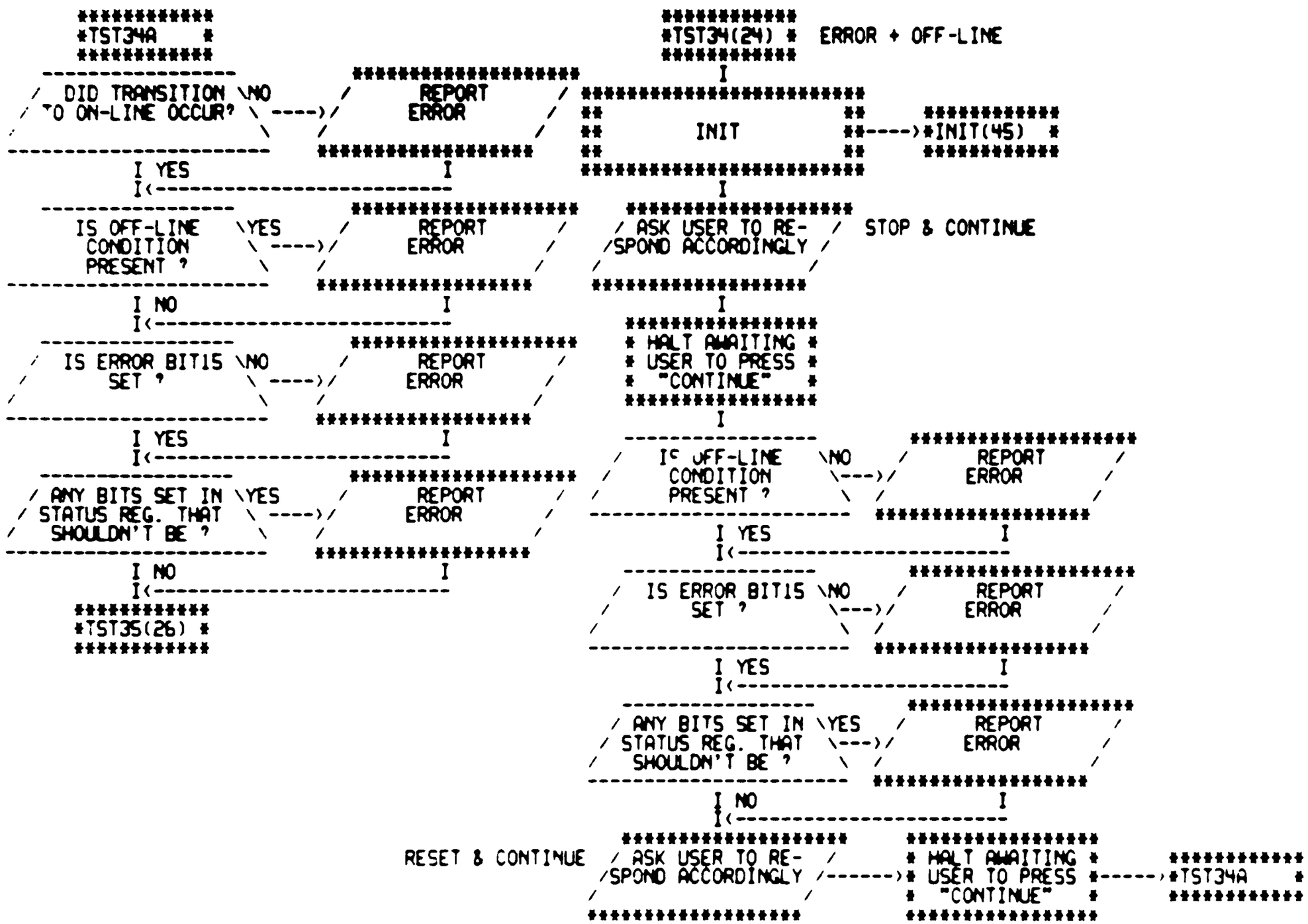

ISRDE(19)
IS THIS THE FIRST CARD ?
YES
CALCULATE PRESENT POSIT-ION OF IMPORT.
RESET CARD COUNTER (CDCNT)
NO
INHIBIT ERROR PRINTOUT ?
YES
NO
TYPE OUT HEADING, DECK, CARD COUNT, & COLUMN NUMBER
TYPE OUT THE "WAS" AND "SHOULD BE" DATA
HALT ON ERROR ?
YES
HALT
NO
ISRRT

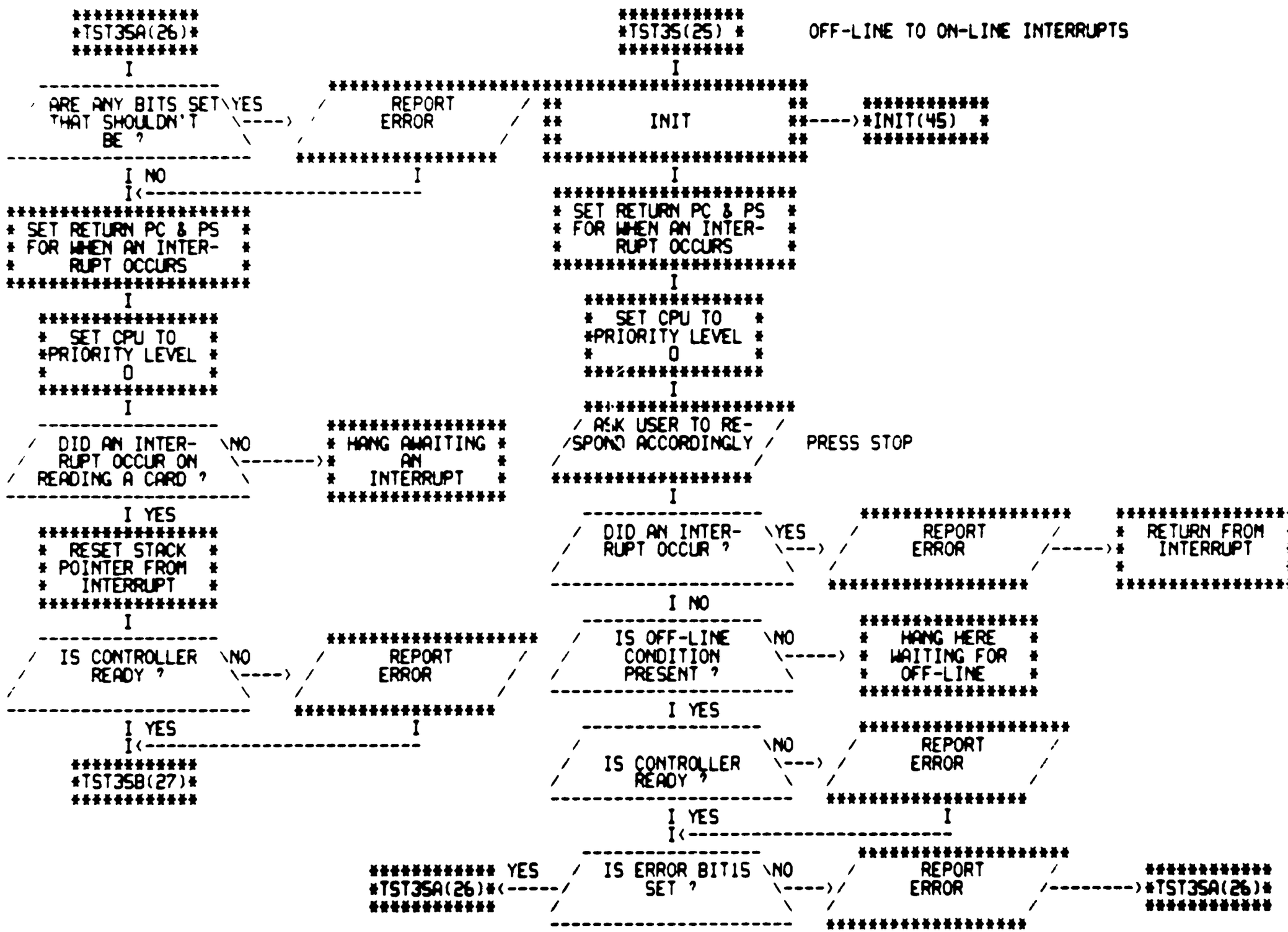

DATRST(22)
RESET STACK POINTER FROM INTERRUPT
*DATST(17) *
IS CARD READER OFF-LINE?
NO
YES
IS CARD READER ERROR (BIT14) SET ?
REPORT ERROR
*ISRE3 *
IS BIT15 SET?
*ISRER(19) *
IS CARD READER ERROR (BIT14) SET ?
DID WE JUST CHECK LAST CARD?
*ISRNC *
END OF FILE ERROR ? (M1200 ONLY)
DATA ERROR ?
DATA LATE ERROR?
NON-EXISTANT MEMORY ERROR?
DATST3(22)
ARE ANY BIT/S FROM BIT09 THRU BIT14 SET ?

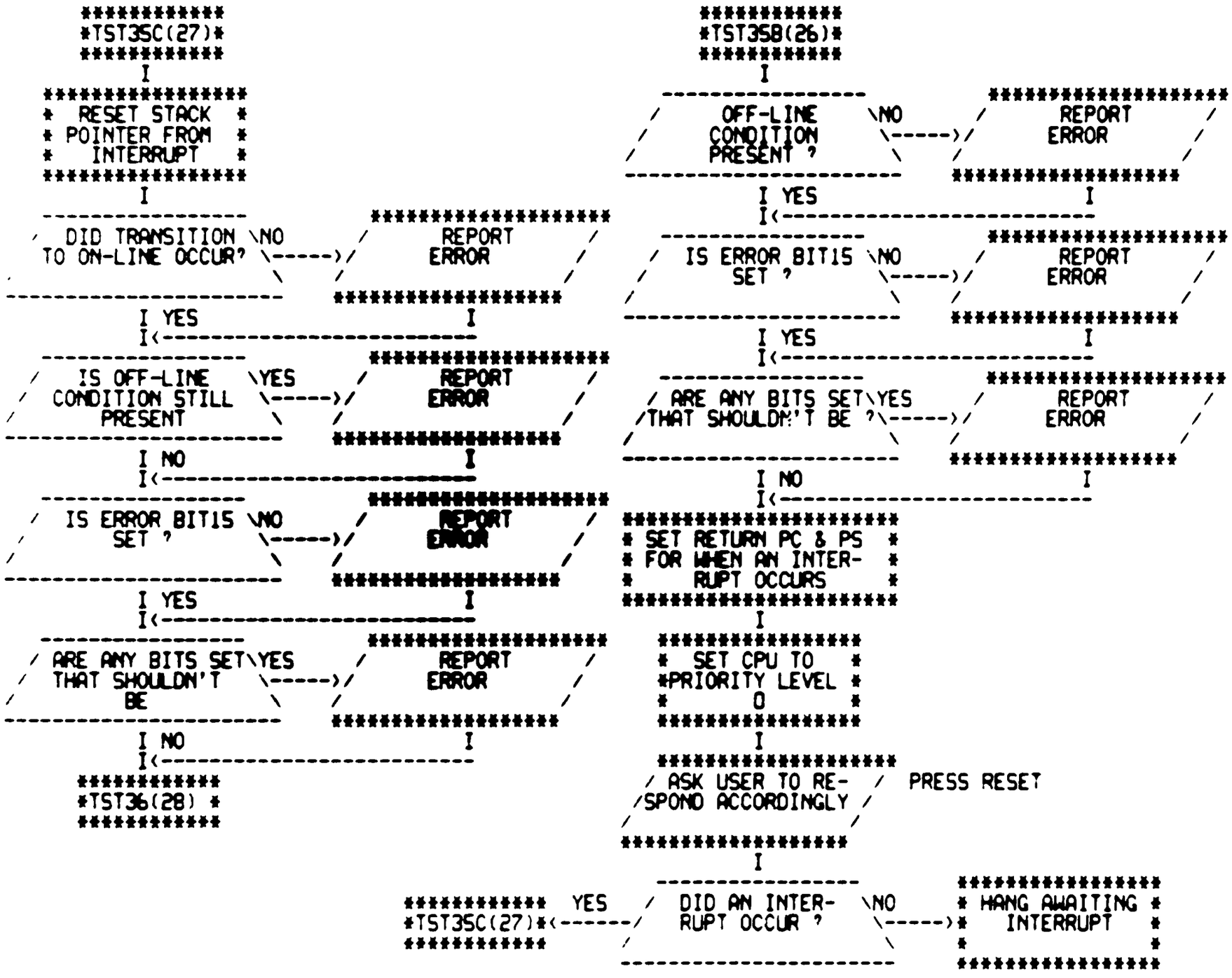
```
*-------------------------------------------------------*
  DATA RELIABILITY TESTING FOR PACKED MODE WILL

          ************                    ************
  START AT *DATST(17) * & BRANCH OFF TO*PSR       *
          ************                    ************

  WHERE DATA WILL BE HANDLED AS OUTLINED IN

                       ************
  SECTION STARTING AT *ISR(19)   *WITH ONLY ONE
                       ************

  EXCEPTION:  DATA IS HANDLED USING BYTE CONSTRUCTION

*-------------------------------------------------------*
```

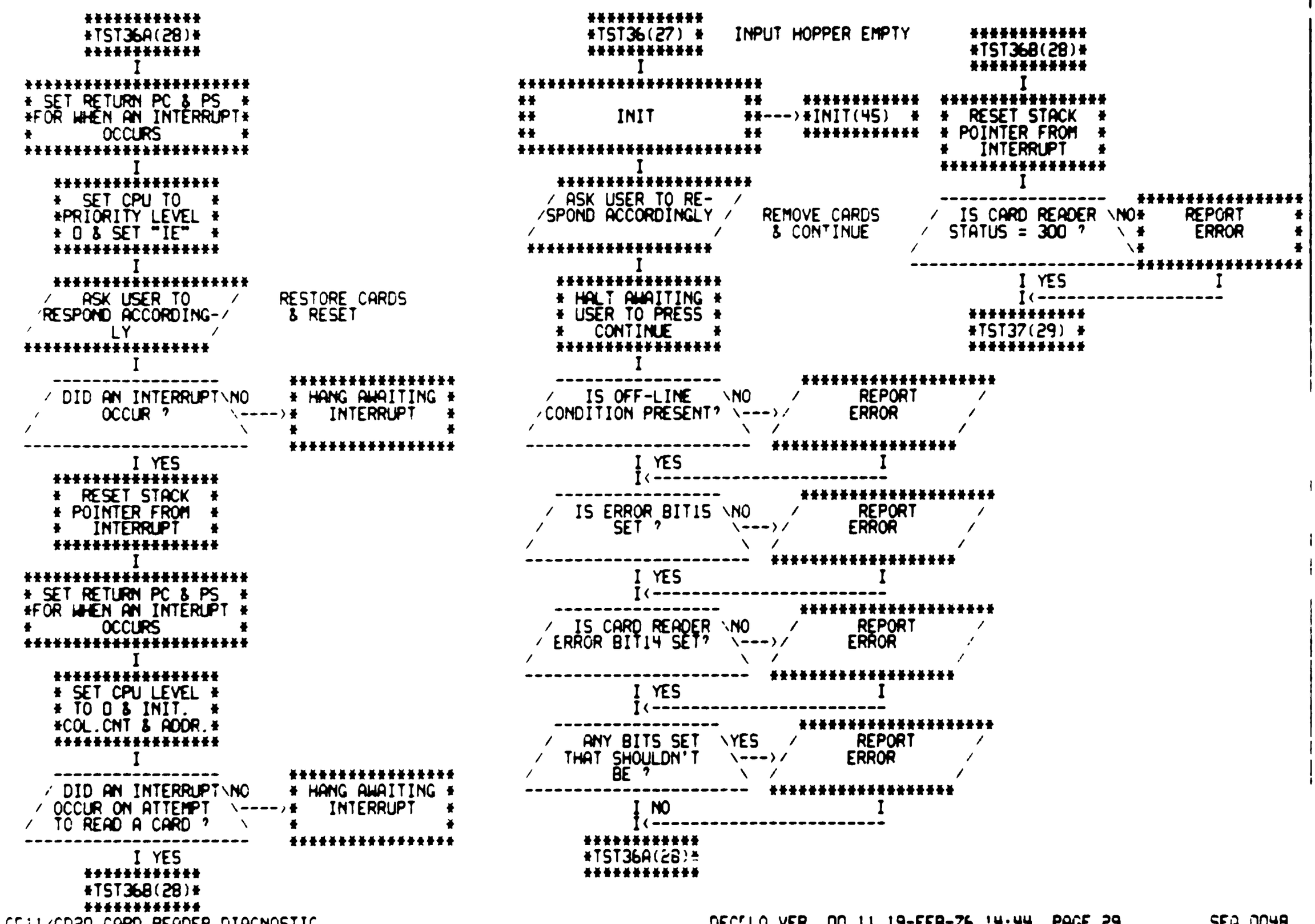

TST33A(24)
*ER12CD
ER1200(39)
START ADDRESS = 250
WAS THERE A DATA LATE ERROR ?
NO
REPORT ERROR
YES
*TST33 *
DATA LATE
INIT
*INIT(45) *
ANY BITS SET IN STATUS REG. THAT SHOULDN'T BE?
YES
REPORT ERROR
NO
ASK USER TO RESPOND ACCORDINGLY
HALT & SINGLE BUS CYCLE
*TST34(25) *
SET UP A COLUMN COUNT * AND A BUS ADDRESS * * REGISTER LOCATION *
HALT AWAITING USER TO PRESS "CONTINUE"
START READING A CARD
IS CONTROLLER READY ?
NO
REPORT ERROR
YES
IS ERROR BITS SET ?
NO
REPORT ERROR
YES
TST33A(24)

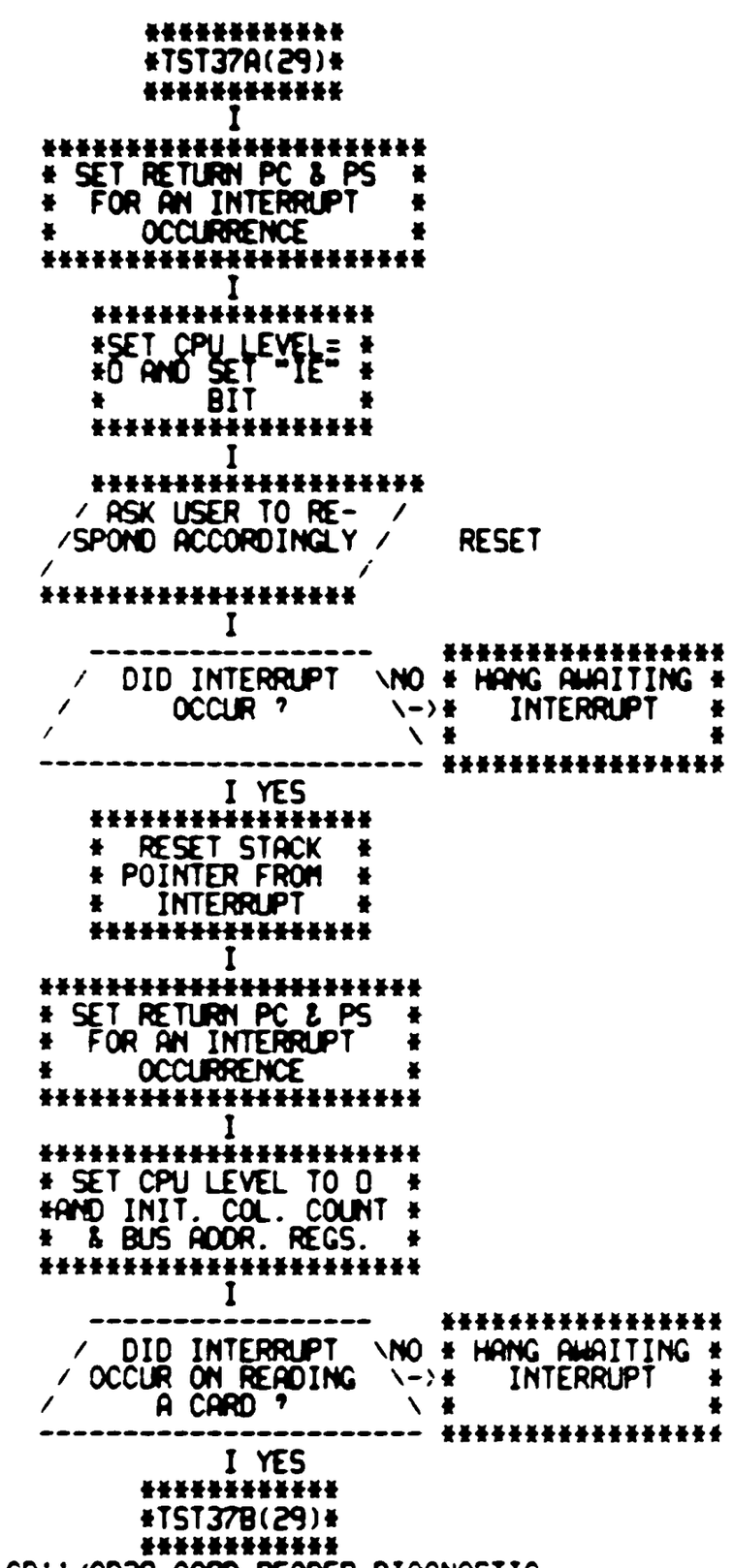
F04

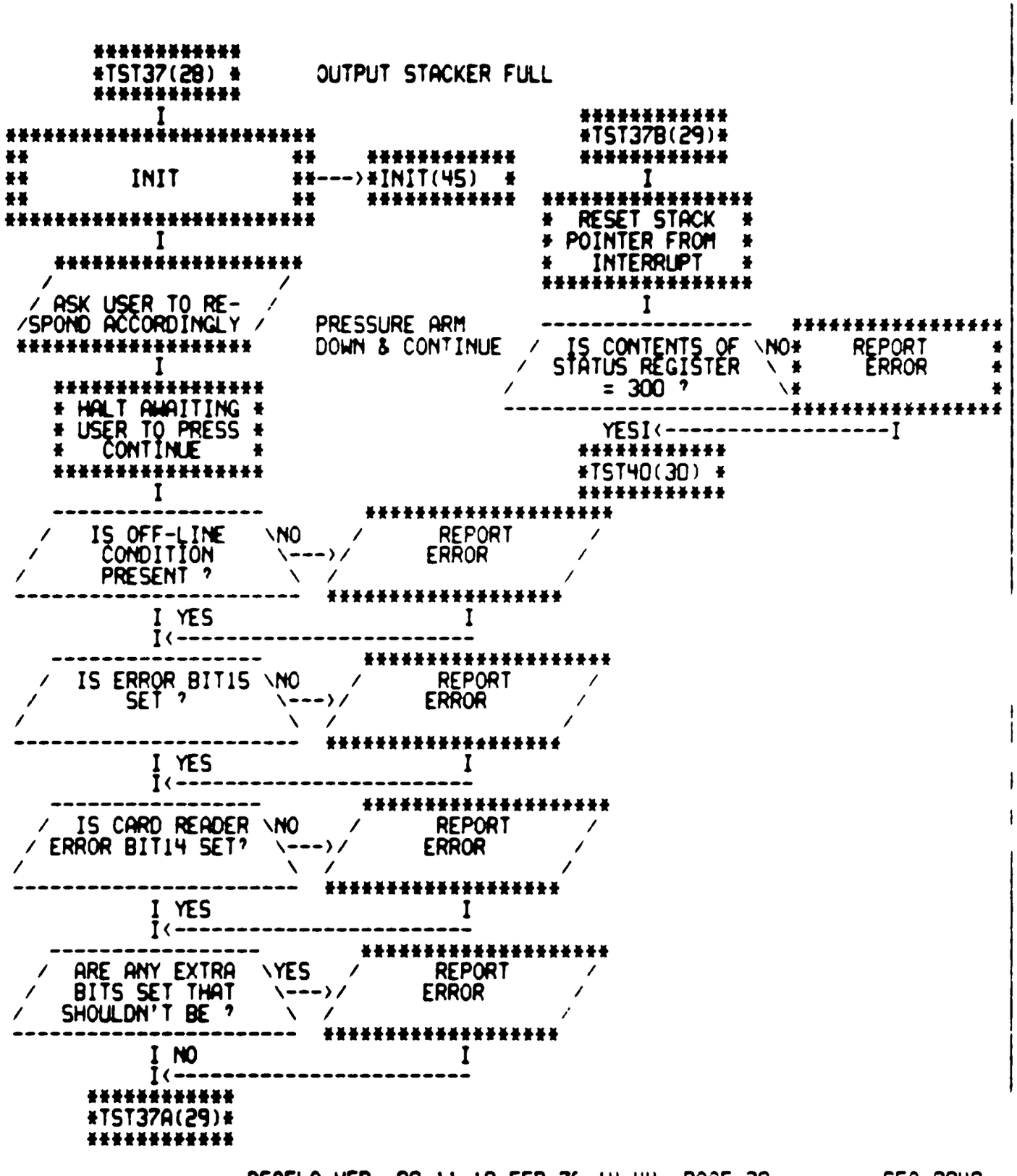

*TST34A *
DID TRANSITION TO ON-LINE OCCUR?
NO
REPORT ERROR
YES
IS OFF-LINE CONDITION PRESENT ?
YES
REPORT ERROR
NO
IS ERROR BIT15 SET ?
NO
REPORT ERROR
YES
ANY BITS SET IN STATUS REG. THAT SHOULDN'T BE ?
YES
REPORT ERROR
NO
*TST35(26) *
*TST34(24) * ERROR + OFF-LINE
INIT
*INIT(45) *
ASK USER TO RESPOND ACCORDINGLY
STOP & CONTINUE
* HALT AWAITING USER TO PRESS "CONTINUE" *
IS OFF-LINE CONDITION PRESENT ?
NO
REPORT ERROR
YES
IS ERROR BIT15 SET ?
NO
REPORT ERROR
YES
ANY BITS SET IN STATUS REG. THAT SHOULDN'T BE ?
YES
REPORT ERROR
NO
ASK USER TO RESPOND ACCORDINGLY
RESET & CONTINUE
* HALT AWAITING USER TO PRESS "CONTINUE" *
*TST34A *

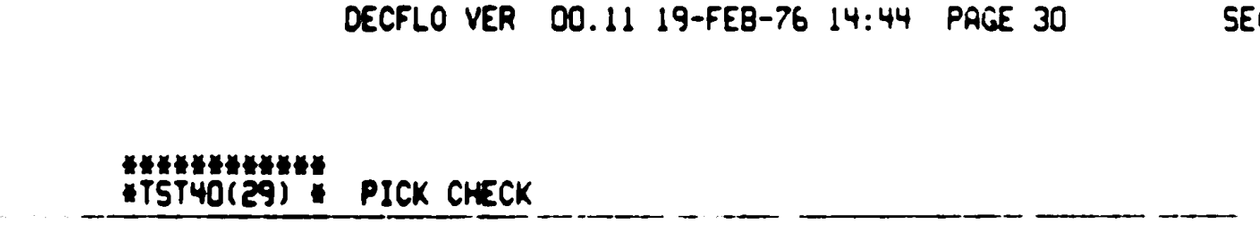

TST35A(26)
ARE ANY BITS SET THAT SHOULDN'T BE ?
YES
REPORT ERROR
I NO
SET RETURN PC & PS FOR WHEN AN INTER-RUPT OCCURS
SET CPU TO *PRIORITY LEVEL * 0
DID AN INTER-RUPT OCCUR ON READING A CARD ?
NO
HANG AWAITING AN INTERRUPT
I YES
RESET STACK POINTER FROM INTERRUPT
IS CONTROLLER READY ?
NO
REPORT ERROR
I YES
TST35B(27)
TST35(25)
OFF-LINE TO ON-LINE INTERRUPTS
INIT
INIT(45)
SET RETURN PC & PS FOR WHEN AN INTER-RUPT OCCURS
SET CPU TO *PRIORITY LEVEL * 0
ASK USER TO RE-SPOND ACCORDINGLY
PRESS STOP
DID AN INTER-RUPT OCCUR ?
YES
REPORT ERROR
RETURN FROM INTERRUPT
I NO
IS OFF-LINE CONDITION PRESENT ?
NO
HANG HERE WAITING FOR OFF-LINE
I YES
IS CONTROLLER READY ?
NO
REPORT ERROR
I YES
IS ERROR BIT15 SET ?
NO
REPORT ERROR
YES
TST35A(26)

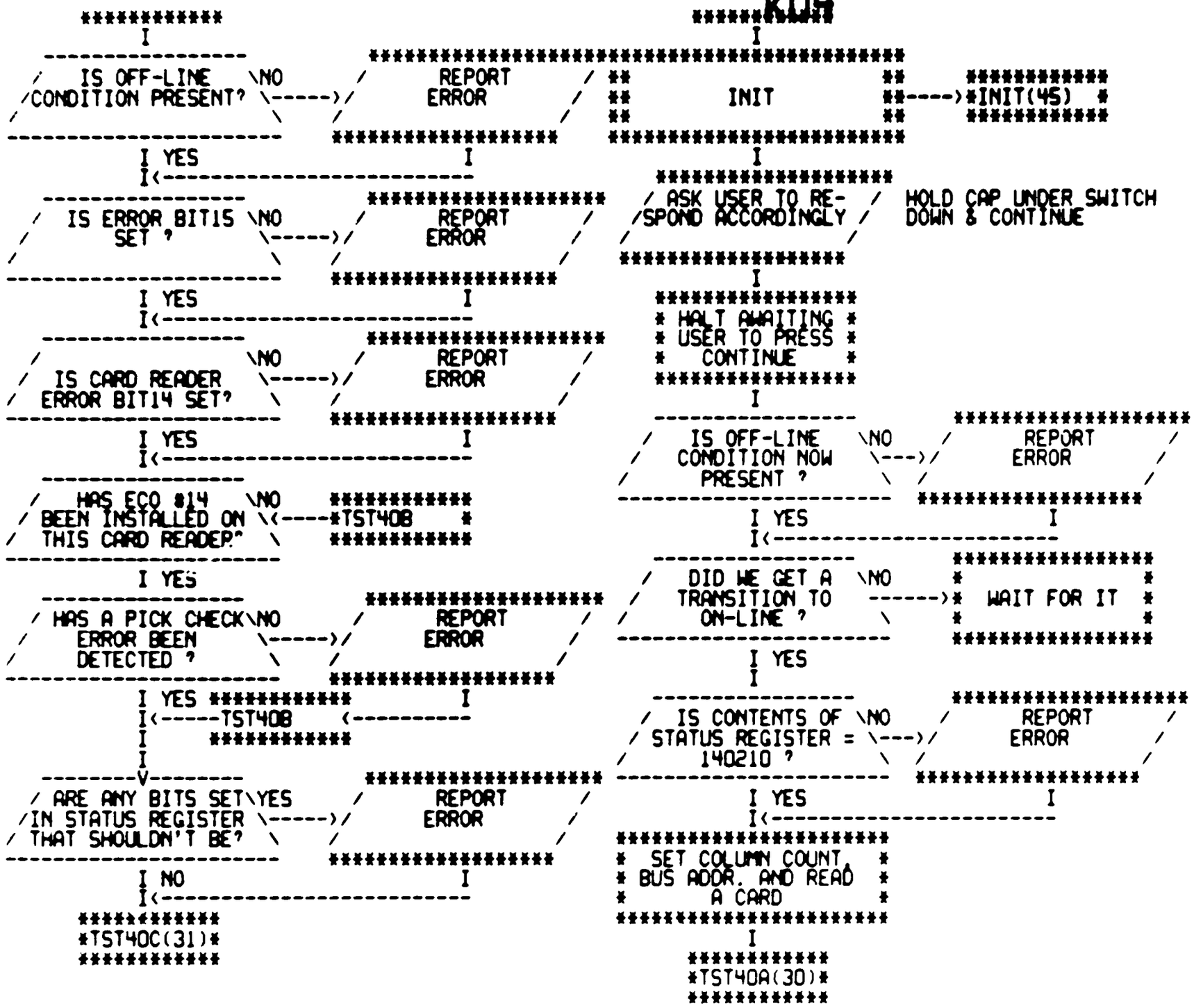

TST35C(27)
RESET STACK POINTER FROM INTERRUPT
DID TRANSITION TO ON-LINE OCCUR? NO
REPORT ERROR
YES
IS OFF-LINE CONDITION STILL PRESENT YES
REPORT ERROR
NO
IS ERROR BIT15 SET ? NO
REPORT ERROR
YES
ARE ANY BITS SET THAT SHOULDN'T BE YES
REPORT ERROR
NO
*TST36(28) *
TST35B(26)
OFF-LINE CONDITION PRESENT ? NO
REPORT ERROR
YES
IS ERROR BIT15 SET ? NO
REPORT ERROR
YES
ARE ANY BITS SET THAT SHOULDN'T BE ? YES
REPORT ERROR
NO
SET RETURN PC & PS FOR WHEN AN INTER-RUPT OCCURS
SET CPU TO PRIORITY LEVEL 0
ASK USER TO RE-SPOND ACCORDINGLY
PRESS RESET
DID AN INTER-RUPT OCCUR ? YES
TST35C(27)
NO
HANG AWAITING INTERRUPT

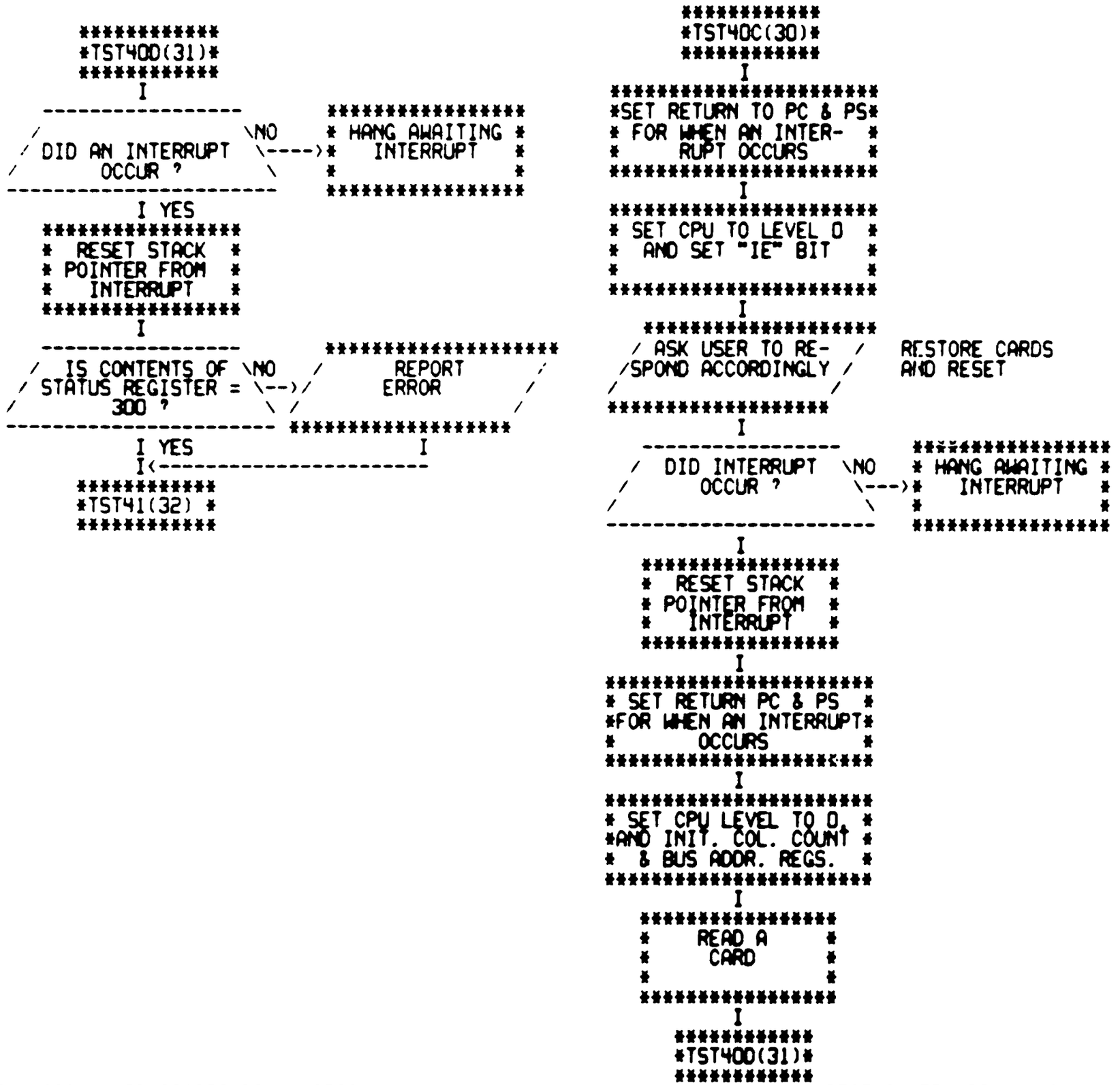

TST36A(28)
SET RETURN PC & PS FOR WHEN AN INTERRUPT OCCURS
SET CPU TO PRIORITY LEVEL 0 & SET "IE"
ASK USER TO RESPOND ACCORDINGLY
RESTORE CARDS & RESET
DID AN INTERRUPT OCCUR ?
HANG AWAITING INTERRUPT
YES
RESET STACK POINTER FROM INTERRUPT
SET RETURN PC & PS FOR WHEN AN INTERRUPT OCCURS
SET CPU LEVEL TO 0 & INIT. COL.CNT & ADDR.
DID AN INTERRUPT OCCUR ON ATTEMPT TO READ A CARD ?
HANG AWAITING INTERRUPT
YES
TST36B(28)
TST36(27)
INPUT HOPPER EMPTY
INIT
INIT(45)
ASK USER TO RESPOND ACCORDINGLY
REMOVE CARDS & CONTINUE
HALT AWAITING USER TO PRESS CONTINUE
IS OFF-LINE CONDITION PRESENT?
REPORT ERROR
YES
IS ERROR BIT15 SET ?
REPORT ERROR
YES
IS CARD READER ERROR BIT14 SET?
REPORT ERROR
YES
ANY BITS SET THAT SHOULDN'T BE ?
REPORT ERROR
YES
NO
TST36A(28)
TST36B(28)
RESET STACK POINTER FROM INTERRUPT
IS CARD READER STATUS = 300 ?
REPORT ERROR
YES
TST37(29)


TST37A(29)
SET RETURN PC & PS FOR AN INTERRUPT OCCURRENCE
SET CPU LEVEL= 0 AND SET "IE" BIT
ASK USER TO RESPOND ACCORDINGLY
RESET
DID INTERRUPT OCCUR ?
NO
HANG AWAITING INTERRUPT
YES
RESET STACK POINTER FROM INTERRUPT
SET RETURN PC & PS FOR AN INTERRUPT OCCURRENCE
SET CPU LEVEL TO 0 AND INIT. COL. COUNT & BUS ADDR. REGS.
DID INTERRUPT OCCUR ON READING A CARD ?
NO
HANG AWAITING INTERRUPT
YES
TST37B(29)

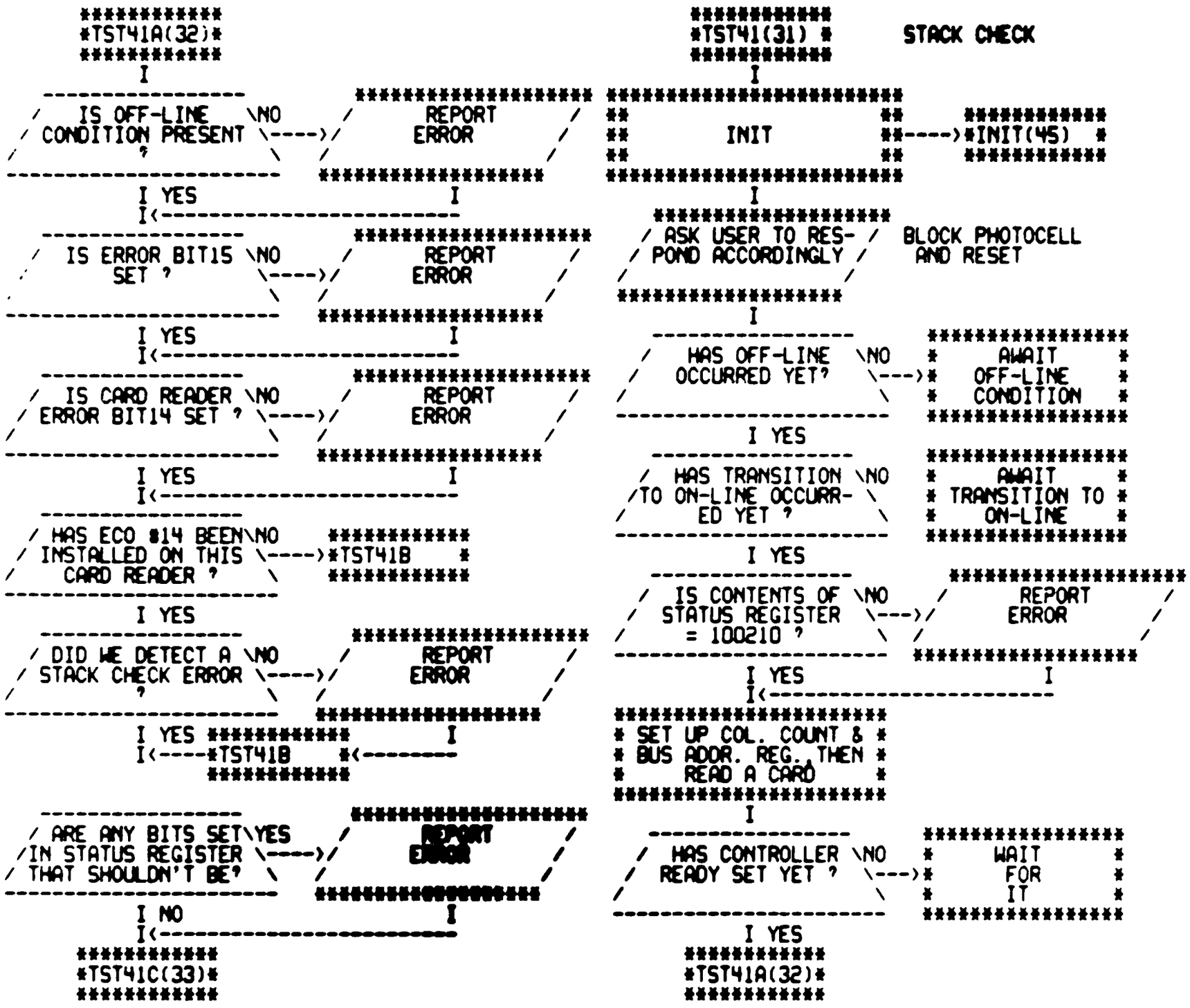

*TST37(28) *
INIT
*INIT(45) *
ASK USER TO RESPOND ACCORDINGLY
OUTPUT STACKER FULL
PRESSURE ARM DOWN & CONTINUE
HALT AWAITING USER TO PRESS CONTINUE
IS OFF-LINE CONDITION PRESENT ?
NO
REPORT ERROR
YES
IS ERROR BIT15 SET ?
NO
REPORT ERROR
YES
IS CARD READER ERROR BIT14 SET?
NO
REPORT ERROR
YES
ARE ANY EXTRA BITS SET THAT SHOULDN'T BE ?
NO
REPORT ERROR
TST37A(29)
TST37B(29)
RESET STACK POINTER FROM INTERRUPT
IS CONTENTS OF STATUS REGISTER = 300 ?
NO
REPORT ERROR
YES
*TST40(30) *


TST40A(30)
*TST40(29) *
PICK CHECK

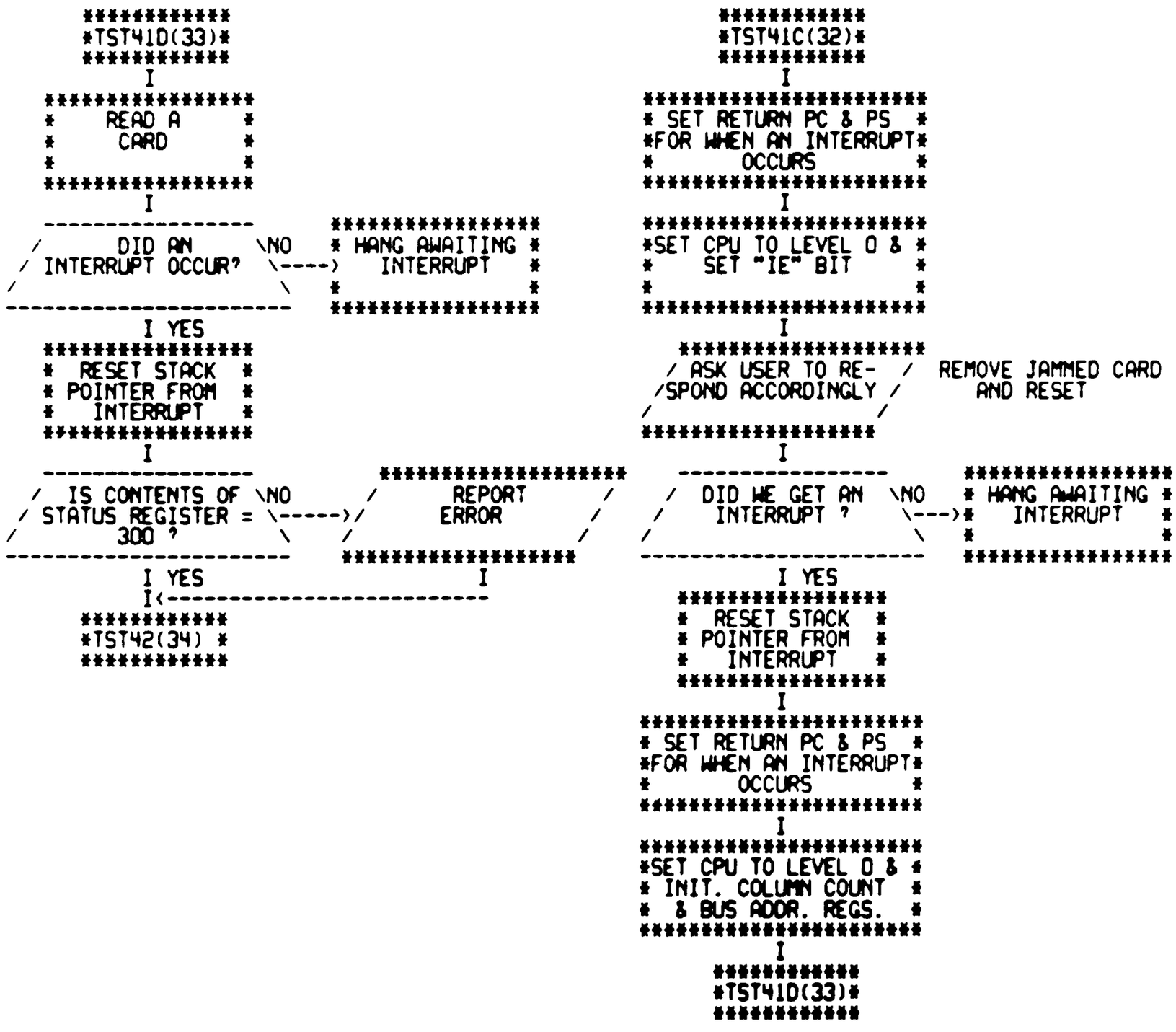

INIT
INIT(45)
IS OFF-LINE CONDITION PRESENT?
NO
REPORT ERROR
YES
IS ERROR BIT15 SET ?
NO
REPORT ERROR
YES
IS CARD READER ERROR BIT14 SET?
NO
REPORT ERROR
YES
HAS ECO #14 BEEN INSTALLED ON THIS CARD READER?
NO
TST40B
YES
HAS A PICK CHECK ERROR BEEN DETECTED ?
NO
REPORT ERROR
YES
TST40B
ARE ANY BITS SET IN STATUS REGISTER THAT SHOULDN'T BE?
YES
REPORT ERROR
NO
TST40C(31)
ASK USER TO RESPOND ACCORDINGLY
HOLD CAP UNDER SWITCH DOWN & CONTINUE
HALT AWAITING USER TO PRESS CONTINUE
IS OFF-LINE CONDITION NOW PRESENT ?
NO
REPORT ERROR
YES
DID WE GET A TRANSITION TO ON-LINE ?
NO
WAIT FOR IT
YES
IS CONTENTS OF STATUS REGISTER = 140210 ?
NO
REPORT ERROR
YES
SET COLUMN COUNT, BUS ADDR. AND READ A CARD
TST40A(30)

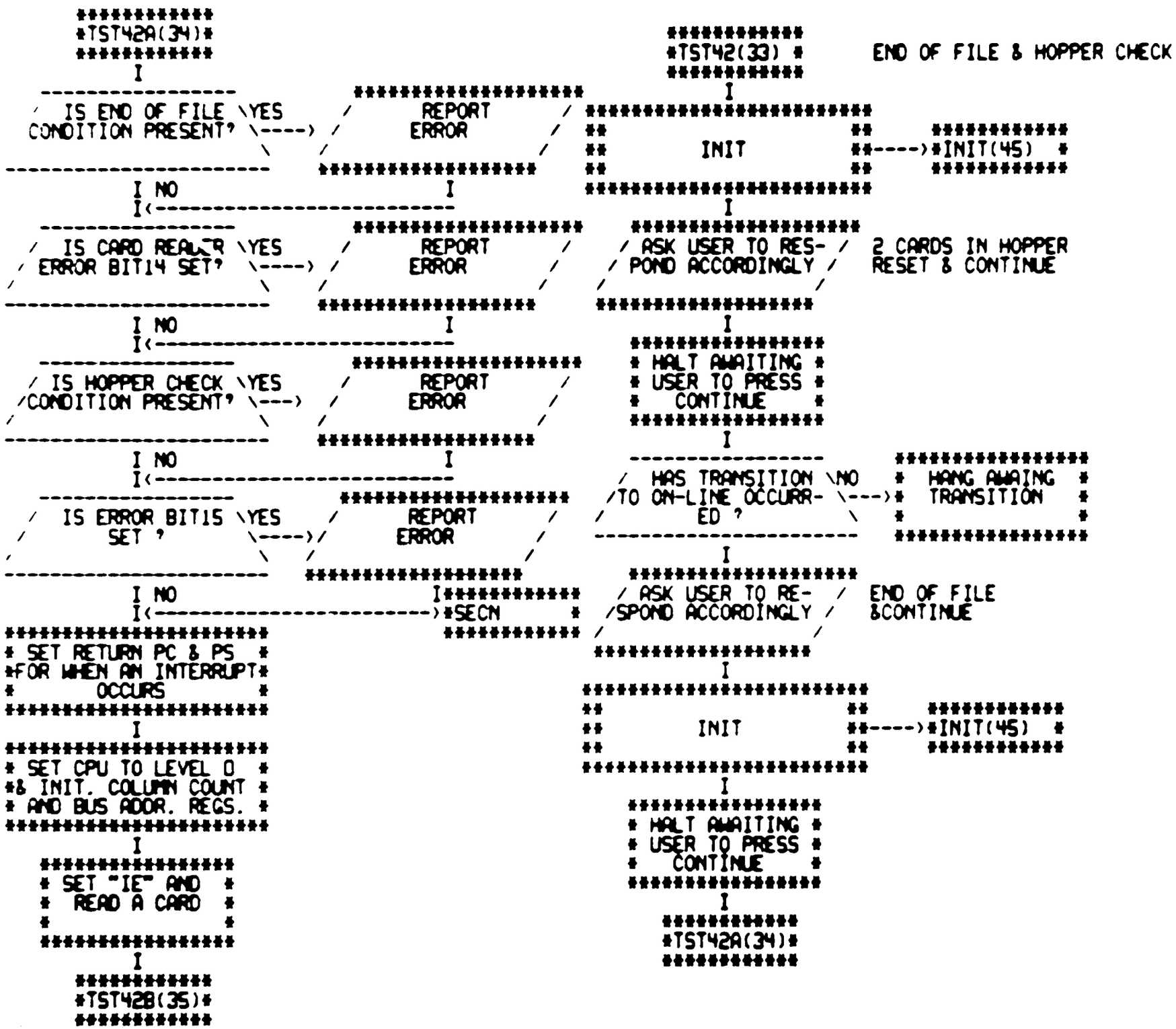

TST40D(31)
DID AN INTERRUPT OCCUR ?
NO
HANG AWAITING INTERRUPT
YES
RESET STACK POINTER FROM INTERRUPT
IS CONTENTS OF STATUS REGISTER = 300 ?
NO
REPORT ERROR
YES
TST41(32)
TST40C(30)
SET RETURN TO PC & PS FOR WHEN AN INTER-RUPT OCCURS
SET CPU TO LEVEL 0 AND SET "IE" BIT
ASK USER TO RE-SPOND ACCORDINGLY
RESTORE CARDS AND RESET
DID INTERRUPT OCCUR ?
NO
HANG AWAITING INTERRUPT
RESET STACK POINTER FROM INTERRUPT
SET RETURN PC & PS FOR WHEN AN INTERRUPT OCCURS
SET CPU LEVEL TO 0, AND INIT. COL. COUNT & BUS ADDR. REGS.
READ A CARD
TST40D(31)

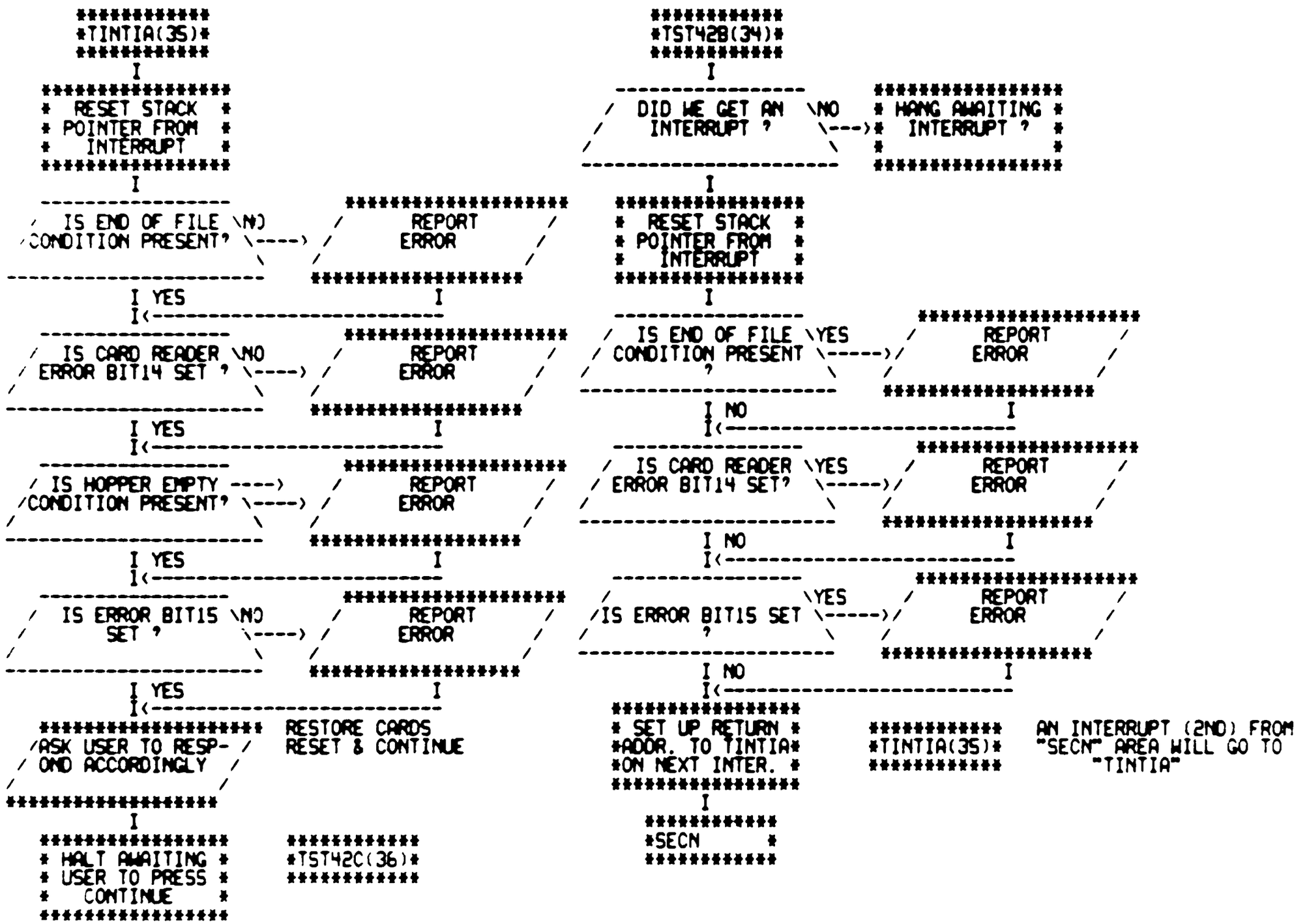
M04

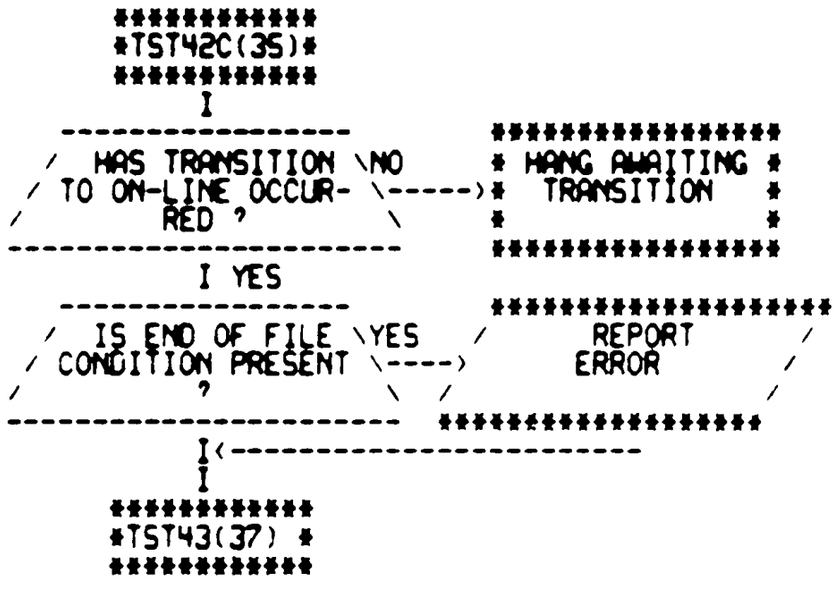

TST41A(32)
IS OFF-LINE CONDITION PRESENT ?
NO
REPORT ERROR
YES
IS ERROR BIT15 SET ?
NO
REPORT ERROR
YES
IS CARD READER ERROR BIT14 SET ?
NO
REPORT ERROR
YES
HAS ECO #14 BEEN INSTALLED ON THIS CARD READER ?
NO
TST41B
YES
DID WE DETECT A STACK CHECK ERROR ?
NO
REPORT ERROR
YES
TST41B
ARE ANY BITS SET IN STATUS REGISTER THAT SHOULDN'T BE?
YES
REPORT ERROR
NO
TST41C(33)

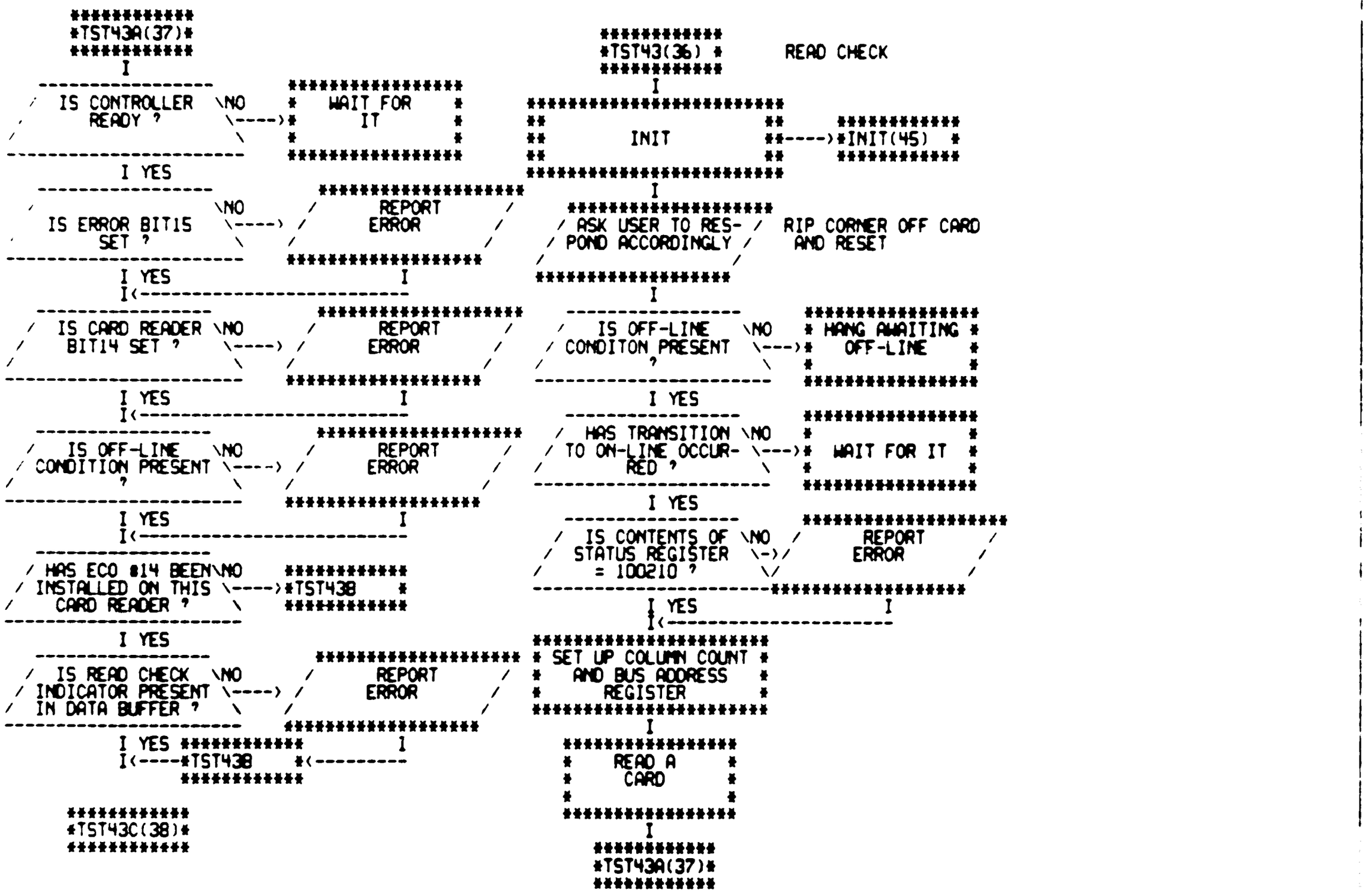
TST41(31)
STACK CHECK
INIT
INIT(45)
ASK USER TO RESPOND ACCORDINGLY
BLOCK PHOTOCELL AND RESET
HAS OFF-LINE OCCURRED YET?
NO
AWAIT OFF-LINE CONDITION
YES
HAS TRANSITION TO ON-LINE OCCURRED YET ?
NO
AWAIT TRANSITION TO ON-LINE
YES
IS CONTENTS OF STATUS REGISTER = 100210 ?
NO
REPORT ERROR
YES
SET UP COL. COUNT & BUS ADDR. REG., THEN READ A CARD
HAS CONTROLLER READY SET YET ?
NO
WAIT FOR IT
YES
TST41A(32)

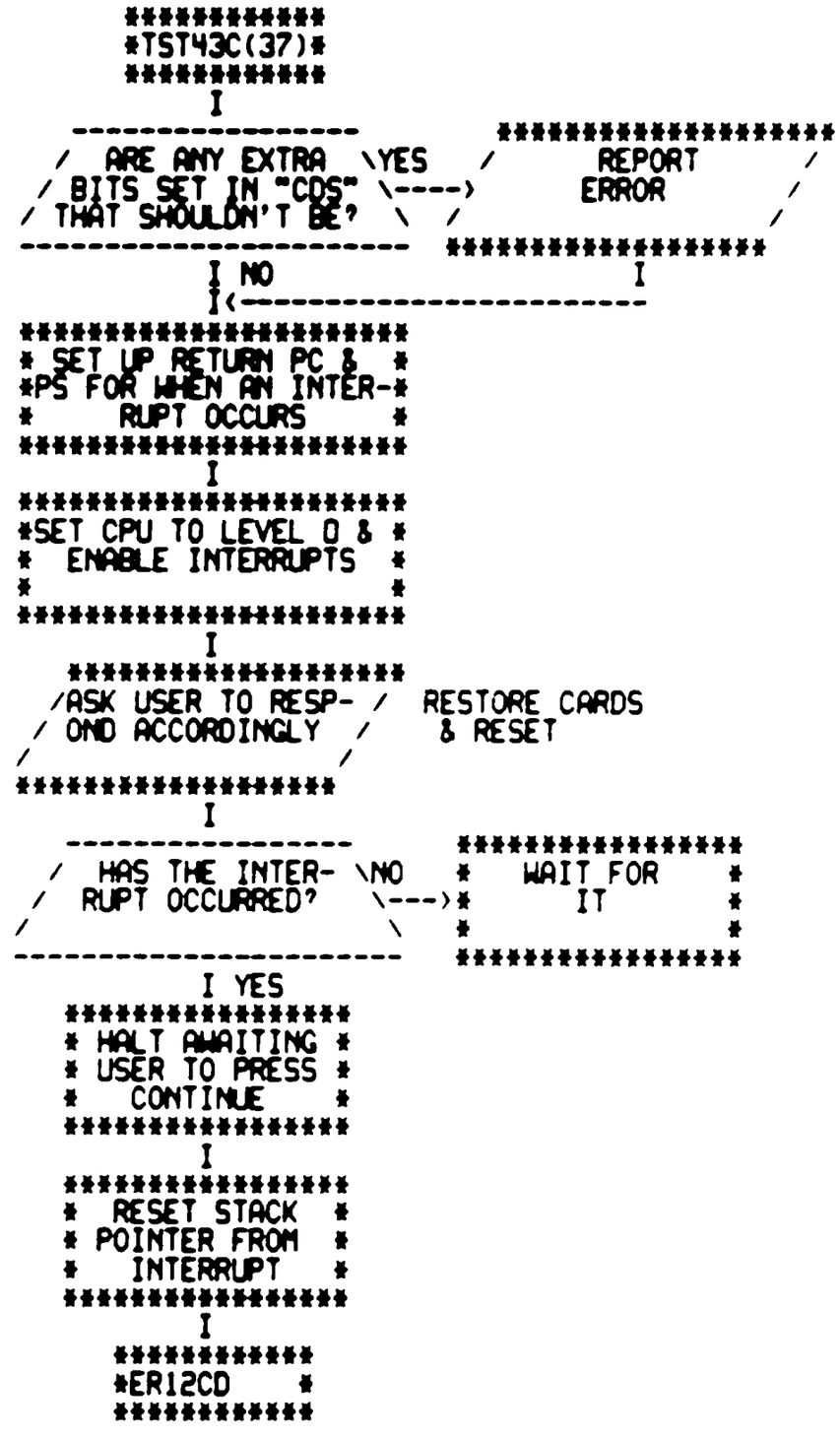

TST41D(33)
READ A CARD
DID AN INTERRUPT OCCUR?
NO
HANG AWAITING INTERRUPT
YES
RESET STACK POINTER FROM INTERRUPT
IS CONTENTS OF STATUS REGISTER = 300 ?
NO
REPORT ERROR
YES
TST42(34)
TST41C(32)
SET RETURN PC & PS FOR WHEN AN INTERRUPT OCCURS
SET CPU TO LEVEL 0 & SET "IE" BIT
ASK USER TO RE-SPOND ACCORDINGLY
REMOVE JAMMED CARD AND RESET
DID WE GET AN INTERRUPT ?
NO
HANG AWAITING INTERRUPT
YES
RESET STACK POINTER FROM INTERRUPT
SET RETURN PC & PS FOR WHEN AN INTERRUPT OCCURS
SET CPU TO LEVEL 0 & INIT. COLUMN COUNT & BUS ADDR. REGS.
TST41D(33)


TST42A(34)
IS END OF FILE CONDITION PRESENT? YES
REPORT ERROR
NO
IS CARD READER ERROR BIT14 SET? YES
REPORT ERROR
NO
IS HOPPER CHECK CONDITION PRESENT? YES
REPORT ERROR
NO
IS ERROR BIT15 SET ? YES
REPORT ERROR
NO
SECN
SET RETURN PC & PS FOR WHEN AN INTERRUPT OCCURS
SET CPU TO LEVEL 0 & INIT. COLUMN COUNT AND BUS ADDR. REGS.
SET "IE" AND READ A CARD
TST42B(35)
TST42(33)
END OF FILE & HOPPER CHECK
INIT
INIT(45)
ASK USER TO RESPOND ACCORDINGLY
2 CARDS IN HOPPER RESET & CONTINUE
HALT AWAITING USER TO PRESS CONTINUE
HAS TRANSITION TO ON-LINE OCCURRED ?
NO
HANG AWAITING TRANSITION
ASK USER TO RESPOND ACCORDINGLY
END OF FILE &CONTINUE
INIT
INIT(45)
HALT AWAITING USER TO PRESS CONTINUE
TST42A(34)

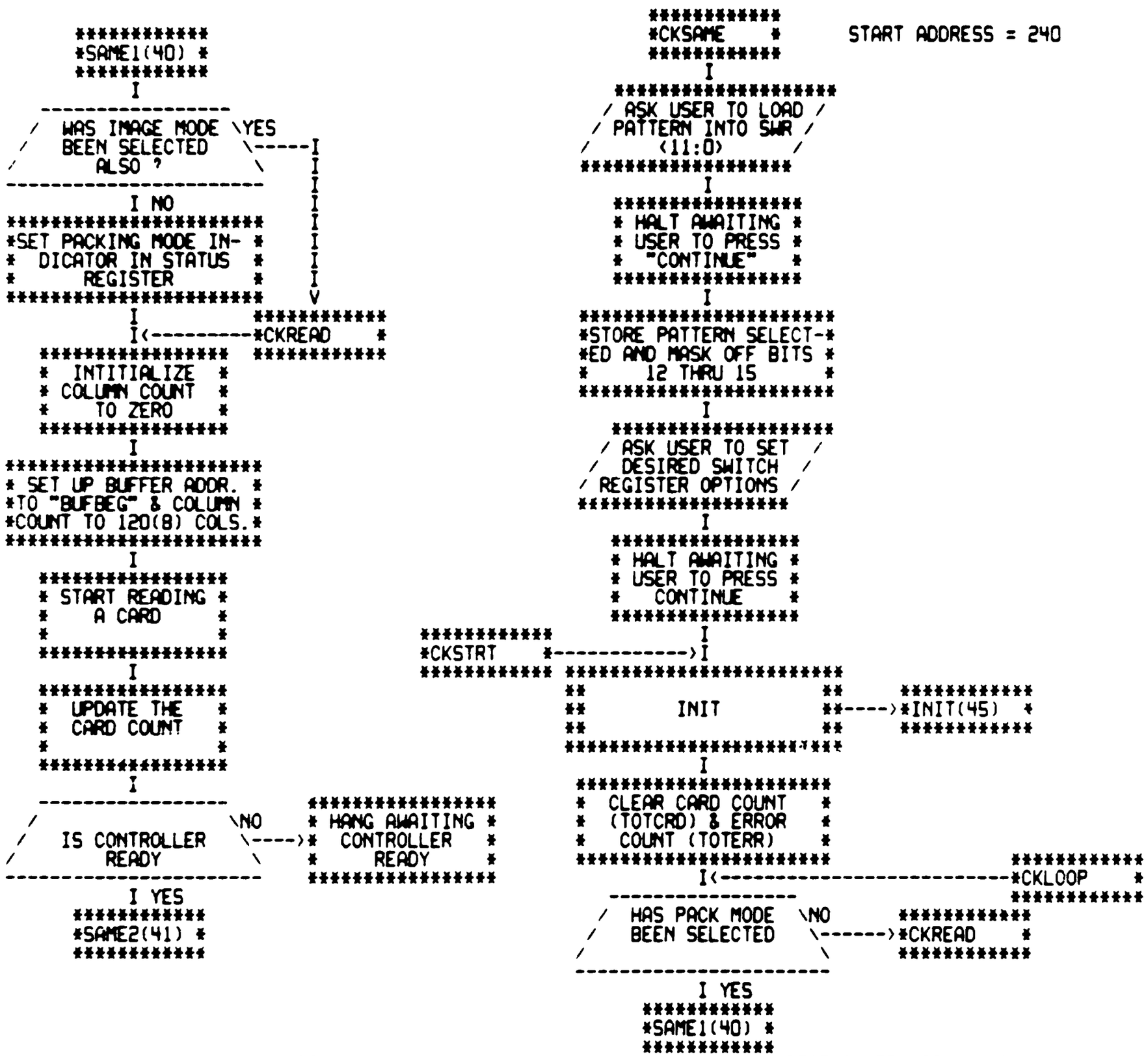

TINTIA(35)
RESET STACK POINTER FROM INTERRUPT
IS END OF FILE CONDITION PRESENT?
REPORT ERROR
YES
IS CARD READER ERROR BIT14 SET ?
REPORT ERROR
YES
IS HOPPER EMPTY CONDITION PRESENT?
REPORT ERROR
YES
IS ERROR BIT15 SET ?
REPORT ERROR
YES
ASK USER TO RESP- OND ACCORDINGLY
RESTORE CARDS RESET & CONTINUE
HALT AWAITING USER TO PRESS CONTINUE
TST42C(36)
TST42B(34)
DID WE GET AN INTERRUPT ?
NO
HANG AWAITING INTERRUPT ?
RESET STACK POINTER FROM INTERRUPT
IS END OF FILE CONDITION PRESENT ?
REPORT ERROR
NO
IS CARD READER ERROR BIT14 SET?
REPORT ERROR
NO
IS ERROR BIT15 SET ?
REPORT ERROR
NO
SET UP RETURN ADDR. TO TINTIA ON NEXT INTER.
TINTIA(35)
AN INTERRUPT (2ND) FROM "SECN" AREA WILL GO TO "TINTIA"
SECN


TST42C(35)
HAS TRANSITION TO ON-LINE OCCURRED ?
NO
HANG AWAITING TRANSITION
YES
IS END OF FILE CONDITION PRESENT ?
YES
REPORT ERROR
TST43(37)

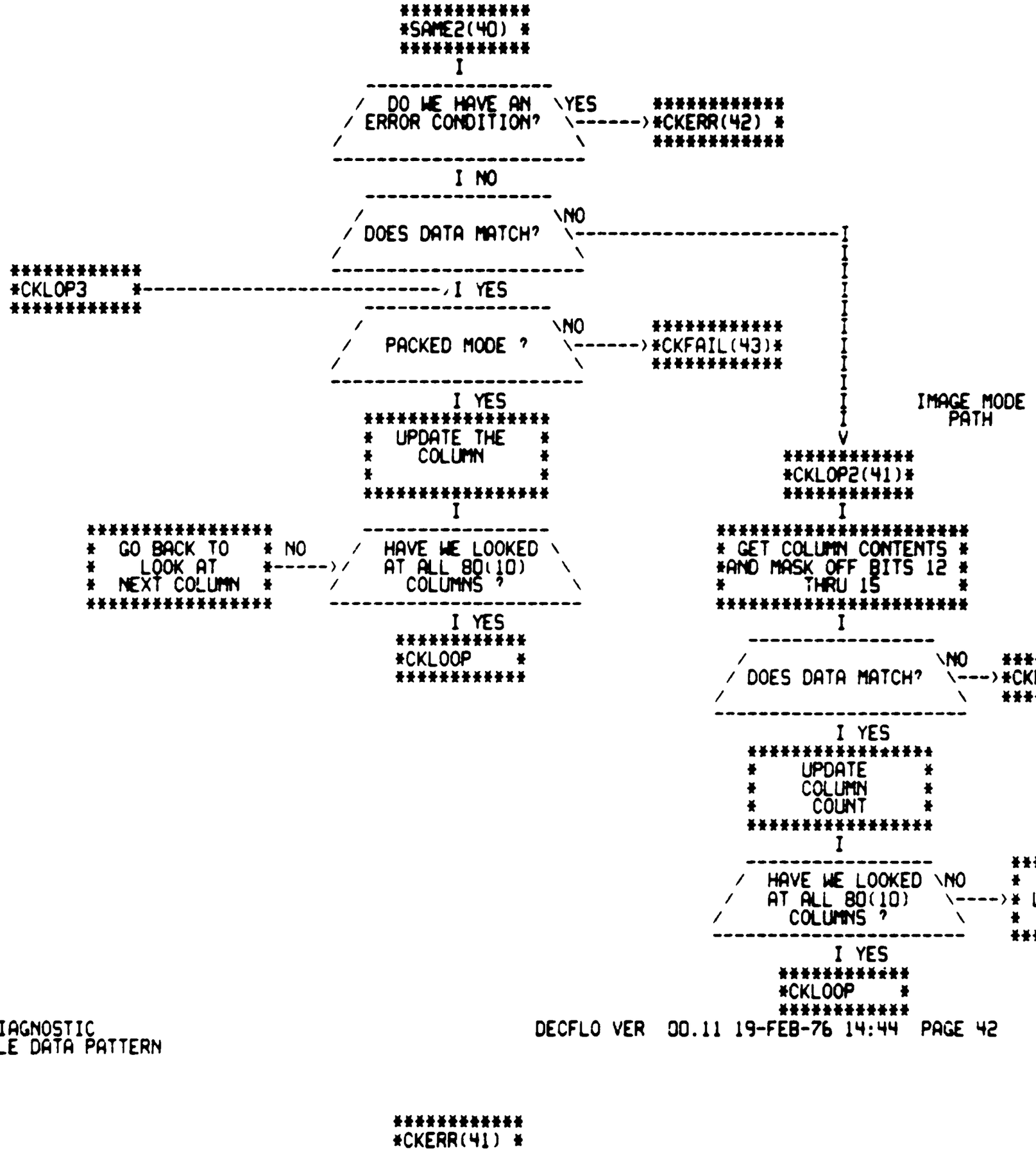

TST43A(37)
IS CONTROLLER READY ?
NO
WAIT FOR IT
YES
IS ERROR BIT15 SET ?
NO
REPORT ERROR
YES
IS CARD READER BIT14 SET ?
NO
REPORT ERROR
YES
IS OFF-LINE CONDITION PRESENT ?
NO
REPORT ERROR
YES
HAS ECO #14 BEEN INSTALLED ON THIS CARD READER ?
NO
TST43B
YES
IS READ CHECK INDICATOR PRESENT IN DATA BUFFER ?
NO
REPORT ERROR
YES
TST43B
TST43C(38)
TST43(36)
READ CHECK
INIT
INIT(45)
ASK USER TO RESPOND ACCORDINGLY
RIP CORNER OFF CARD AND RESET
IS OFF-LINE CONDITON PRESENT ?
NO
HANG AWAITING OFF-LINE
YES
HAS TRANSITION TO ON-LINE OCCURRED ?
NO
WAIT FOR IT
YES
IS CONTENTS OF STATUS REGISTER = 100210 ?
NO
REPORT ERROR
YES
SET UP COLUMN COUNT AND BUS ADDRESS REGISTER
READ A CARD
TST43A(37)

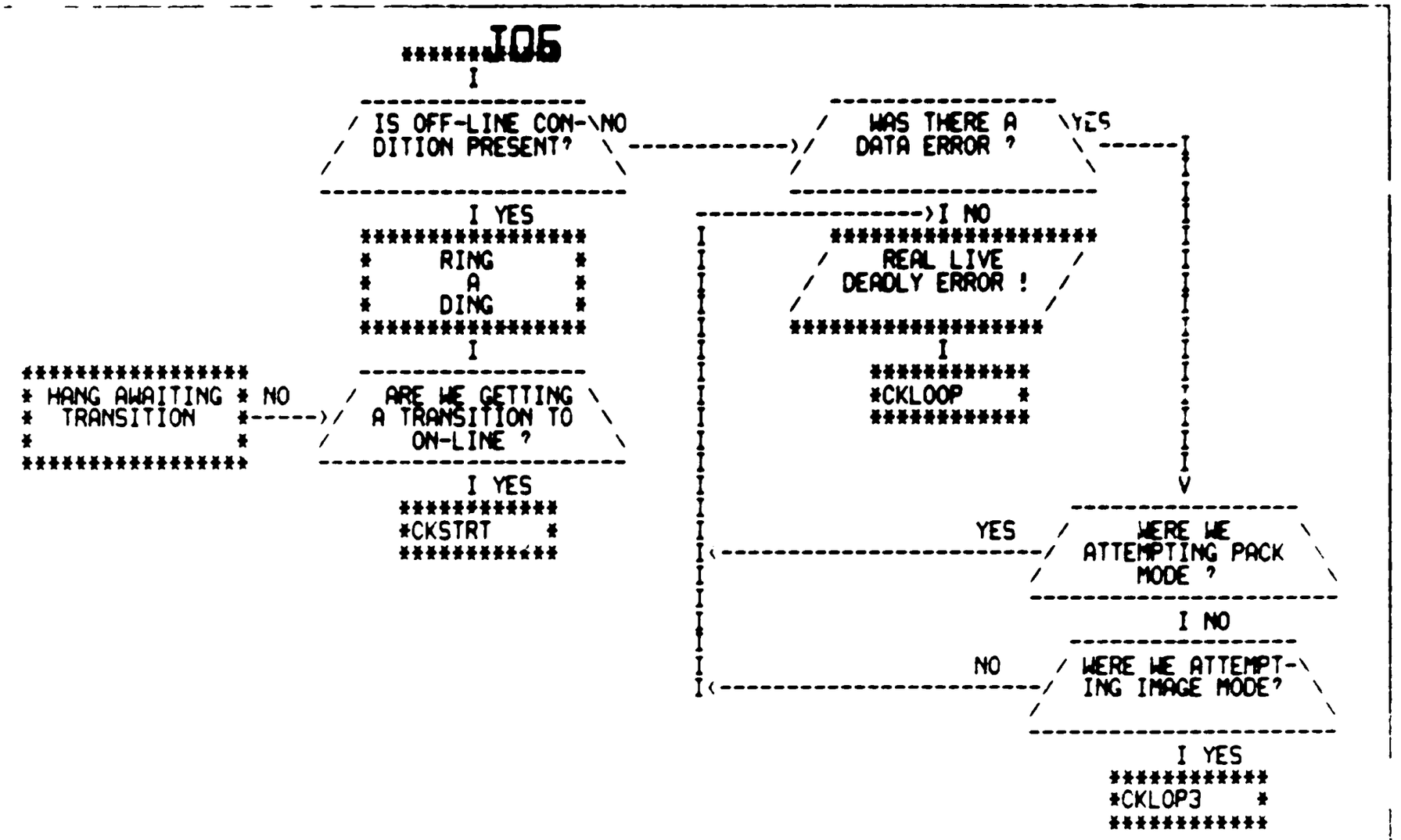

TST43C(37)
ARE ANY EXTRA BITS SET IN "CDS" THAT SHOULDN'T BE?
YES
REPORT ERROR
NO
SET UP RETURN PC & PS FOR WHEN AN INTERRUPT OCCURS
SET CPU TO LEVEL 0 & ENABLE INTERRUPTS
ASK USER TO RESPOND ACCORDINGLY
RESTORE CARDS & RESET
HAS THE INTERRUPT OCCURRED?
NO
WAIT FOR IT
YES
HALT AWAITING USER TO PRESS CONTINUE
RESET STACK POINTER FROM INTERRUPT
ER12CD

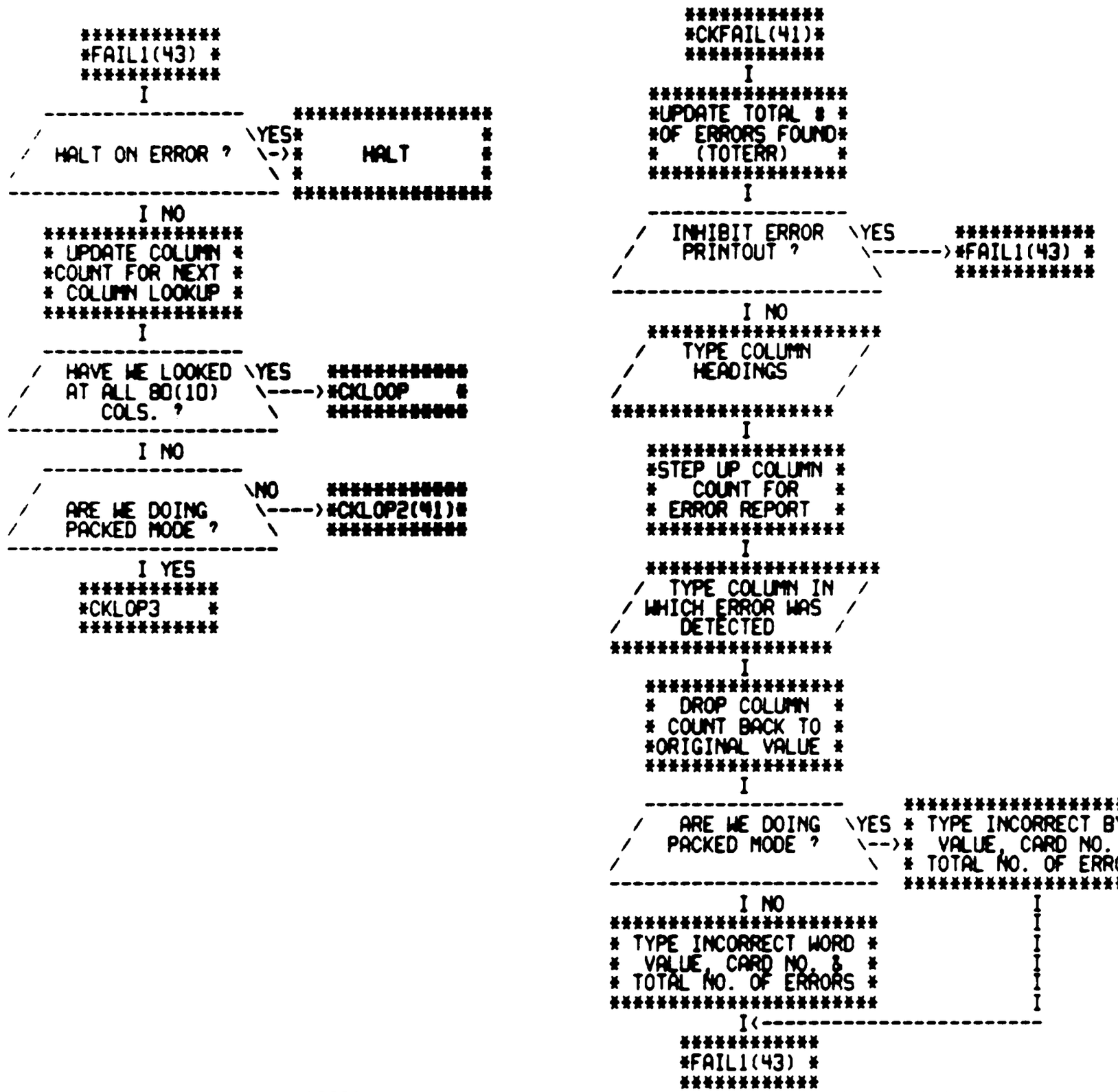
```
*------------------------------------------------------*
  ERROR FUNCTION TESTING OF CARD READER MODELS M1000 OR
  M200 IS IDENTICAL TO THAT OF AN M1200 AS OUTLINED

             ************
  STARTING AT*ER1200(24)*   WITH ONLY ONE EXCEPTION:
             ************

  ************
  *TST42(34) * IS NOT EXCUTED [START ADDRESS = 210]
  ************
*------------------------------------------------------*
```


*SAME1(40) *
WAS IMAGE MODE BEEN SELECTED ALSO ?
YES
NO
*SET PACKING MODE IN- DICATOR IN STATUS REGISTER *
*CKREAD *
INTITIALIZE COLUMN COUNT TO ZERO
* SET UP BUFFER ADDR. *TO "BUFBEG" & COLUMN COUNT TO 120(8) COLS.*
START READING A CARD
UPDATE THE CARD COUNT
IS CONTROLLER READY
NO
HANG AWAITING CONTROLLER READY
YES
*SAME2(41) *
*CKSAME *
START ADDRESS = 240
ASK USER TO LOAD PATTERN INTO SWR (11:0)
HALT AWAITING USER TO PRESS "CONTINUE"
*STORE PATTERN SELECT-*ED AND MASK OFF BITS 12 THRU 15
ASK USER TO SET DESIRED SWITCH REGISTER OPTIONS
HALT AWAITING USER TO PRESS CONTINUE
*CKSTRT *
INIT
*INIT(45) *
CLEAR CARD COUNT (TOTCRD) & ERROR COUNT (TOTERR)
*CKLOOP *
HAS PACK MODE BEEN SELECTED
NO
*CKREAD *
YES
*SAME1(40) *

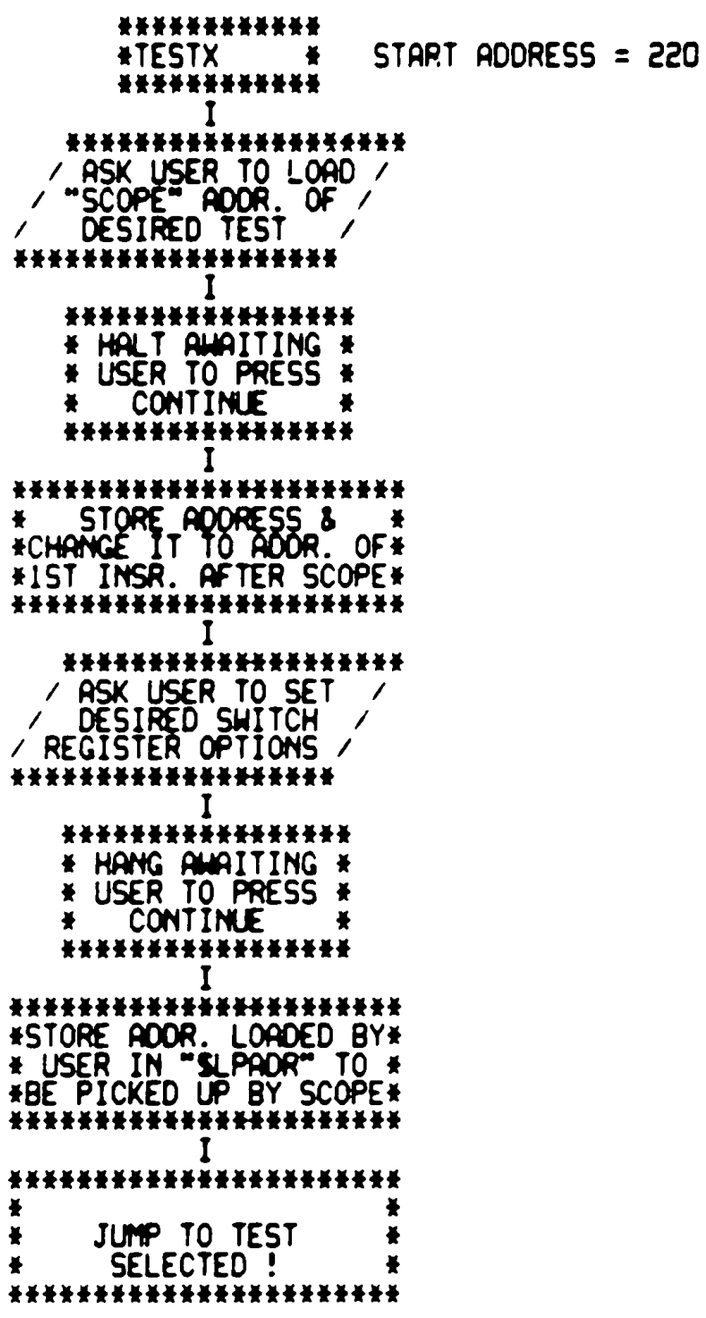
I05

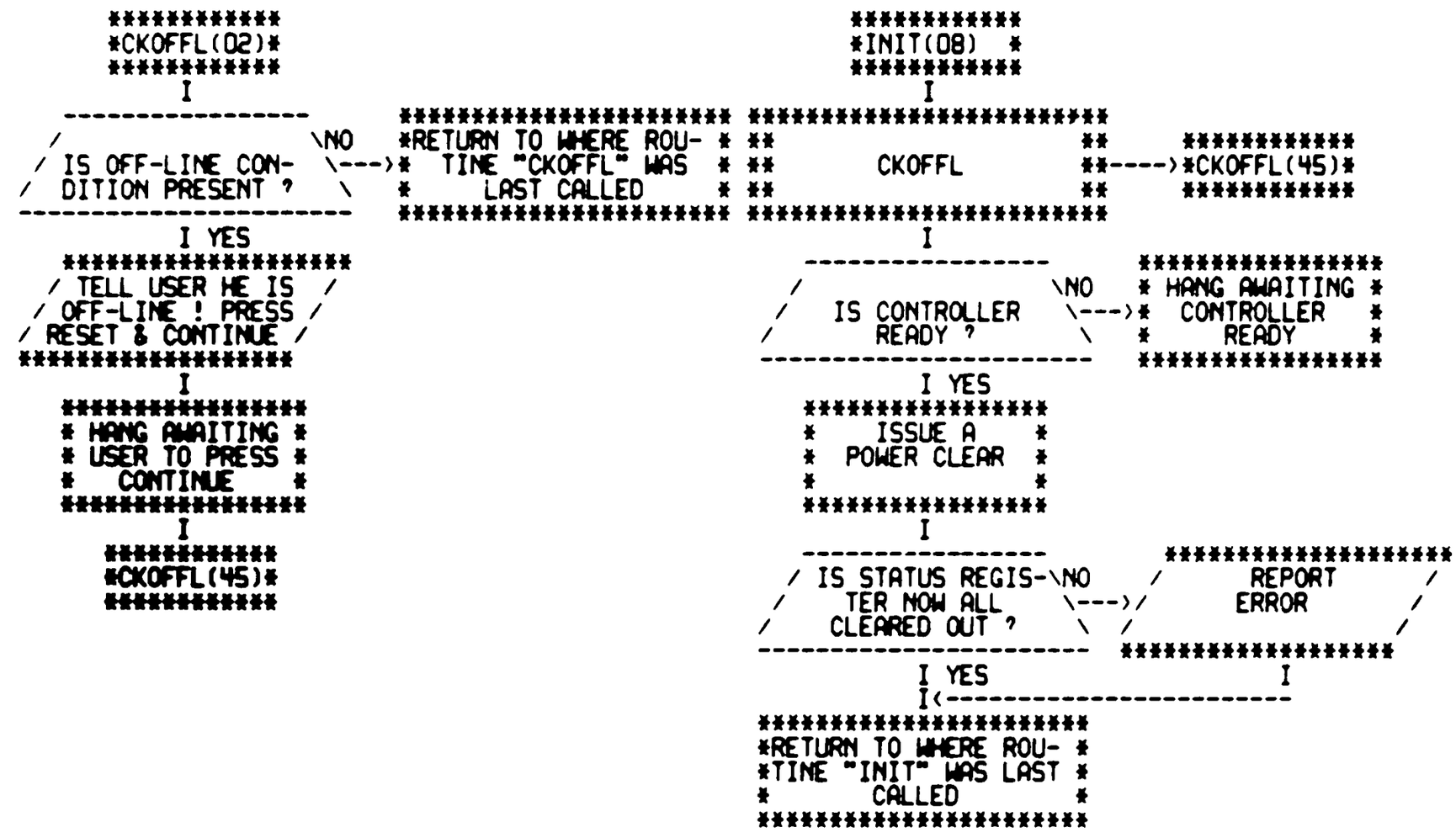

*SAME2(40) *
DO WE HAVE AN ERROR CONDITION?
YES
*CKERR(42) *
NO
DOES DATA MATCH?
NO
*CKLOP3 *
I YES
PACKED MODE ?
NO
CKFAIL(43)
I YES
IMAGE MODE PATH
* UPDATE THE COLUMN *
CKLOP2(41)
* GO BACK TO LOOK AT NEXT COLUMN *
NO
HAVE WE LOOKED AT ALL 80(10) COLUMNS ?
* GET COLUMN CONTENTS *AND MASK OFF BITS 12 THRU 15 *
DOES DATA MATCH?
NO
CKFAIL(43)
I YES
UPDATE COLUMN COUNT
HAVE WE LOOKED AT ALL 80(10) COLUMNS ?
NO
* GO BACK TO LOOK AT NEXT COLUMN *
I YES
*CKLOOP *
CKLOP2(41)
I YES
*CKLOOP *
*CKERR(41) *


IS OFF-LINE CON-\NO
DITION PRESENT?
I YES
RING A DING
HANG AWAITING TRANSITION
NO
ARE WE GETTING A TRANSITION TO ON-LINE ?
I YES
CKSTRT
WAS THERE A DATA ERROR ?
YES
I NO
REAL LIVE DEADLY ERROR !
CKLOOP
WERE WE ATTEMPTING PACK MODE ?
YES
I NO
WERE WE ATTEMPTING IMAGE MODE?
NO
I YES
CKLOP3


*FAIL1(43) *
HALT ON ERROR ?
YES
HALT
NO
* UPDATE COLUMN *
*COUNT FOR NEXT *
* COLUMN LOOKUP *
HAVE WE LOOKED AT ALL 80(10) COLS. ?
YES
*CKLOOP #
NO
ARE WE DOING PACKED MODE ?
NO
CKLOP2(41)
YES
*CKLOP3 *
CKFAIL(41)
*UPDATE TOTAL # *
OF ERRORS FOUND
* (TOTERR) *
INHIBIT ERROR PRINTOUT ?
YES
*FAIL1(43) *
NO
TYPE COLUMN HEADINGS
*STEP UP COLUMN *
* COUNT FOR *
* ERROR REPORT *
TYPE COLUMN IN WHICH ERROR WAS DETECTED
*DROP COLUMN *
* COUNT BACK TO *
*ORIGINAL VALUE *
ARE WE DOING PACKED MODE ?
YES
* TYPE INCORRECT BYTE *
* VALUE, CARD NO. & *
* TOTAL NO. OF ERRORS *
NO
* TYPE INCORRECT WORD *
* VALUE, CARD NO. & *
* TOTAL NO. OF ERRORS *
*FAIL1(43) *

LOS


*TESTX *
START ADDRESS = 220
ASK USER TO LOAD "SCOPE" ADDR. OF DESIRED TEST
HALT AWAITING USER TO PRESS CONTINUE
STORE ADDRESS & CHANGE IT TO ADDR. OF 1ST INSR. AFTER SCOPE
ASK USER TO SET DESIRED SWITCH REGISTER OPTIONS
HANG AWAITING USER TO PRESS CONTINUE
STORE ADDR. LOADED BY USER IN "SLPADR" TO BE PICKED UP BY SCOPE
JUMP TO TEST SELECTED !


CKOFFL(02)
IS OFF-LINE CONDITION PRESENT ?
NO
YES
RETURN TO WHERE ROUTINE "CKOFFL" WAS LAST CALLED
TELL USER HE IS OFF-LINE ! PRESS RESET & CONTINUE
HANG AWAITING USER TO PRESS CONTINUE
CKOFFL(45)
*INIT(08) *
CKOFFL
CKOFFL(45)
IS CONTROLLER READY ?
HANG AWAITING CONTROLLER READY
ISSUE A POWER CLEAR
IS STATUS REGISTER NOW ALL CLEARED OUT ?
REPORT ERROR
RETURN TO WHERE ROUTINE "INIT" WAS LAST CALLED

BEGIN	01																	
BKGND	18	20																
CKERR	41	42																
CKFAIL	41	41	43															
CKLOOP	40	41	41	42	43													
CKLOP2	41	41	43															
CKLOP3	41	42	43															
CKOFFL	02	06	07	45	45	45												
CKREAD	40	40																
CKSAME	40																	
CKSTRT	40	42																
CONT7	08	08																
DATRST	22	22	22	22														
DATST	16	17	22	23														
DATST1	17	18																
DATST2	19	20																
DATST3	22	22																
ENDCK	16	16																
ER1200	24	39																
ER12CD	24	38																
FAIL1	43	43	43															
INIT	08	09	10	11	12	13	15	16	17	24	25	26	28	29	30	32	34	34
	37	40	45															
INTN	08	08																
ISR	18	19	23															
ISRDE	19	21																
ISRE3	22	22																
ISRER	19	22																
ISRLP	19	20	20															
ISRNC	22																	
ISRRT	19	21																
PR?OK	10	10																
PSR	18	23																
RESTRT	16																	
SAME1	40	40																
SAME2	40	41																
SECN	34	35																
SRETRN	20	20																
T10GO	09	09																
T22A	13	13																
T23GO	15																	
T31GO	15																	
TESTX	44																	
TINT10	09	09																
TINT11	10	10																
TINT21	12	12																
TINT22	13	13																
TINT31	15	15																
TINT7	08	08																
TINTIA	35	35																
TST1	01	02																
TST10	08																	

	09			
TST11	09	10	11	
TST2	02	03		
TST20	11			
TST20A	11	11		
TST21	11	12		
TST22	12	13		
TST23	13	14		
TST24	14	14		
TST25	14	14		
TST26	14			
TST3	03	03	04	
TST31	15			
TST32	15	15	16	
TST33	24			
TST33A	24	24	24	
TST34	24	25		
TST34A	25	25		
TST35	25	26		
TST35A	26	26	26	
TST35B	26	27		
TST35C	27	27		
TST36	27	28	28	
TST36A	28	28		
TST36B	28	28		
TST37	28	29		
TST37A	29	29		
TST37B	29	29		
TST4	04	05		
TST40	29	30		
TST40A	30	30		
TST40B	30	30		
TST40C	30	31		
TST40D	31	31		
TST41	31	32		
TST41A	32	32		
TST41B	32	32		
TST41C	32	33		
TST41D	33	33		
TST42	33	34	39	
TST42A	34	34		
TST42B	34	35		
TST42C	35	36		
TST43	36	37		
TST43A	37	37		
TST43B	37	37		
TST43C	37	38		
TST5	05	06		
TST5A	06	06		
TST5B	06	06		
TST6	06	06	06	07
TST6A	07	07		
TST6B	07			

	07		
TST?	07	07	08

TABLE OF CONTENTS

TABLE OF CONTENTS

```
                        .NLIST  MC,MD,CND
                        .LIST   ME
                        .ENABL  ABS,AMA
                        .MCALL  .HEADER,STARS,.$CMTAG,.$CATCH,.$ERROR,.$ERRTYP,SETPRI
                        .MCALL  .EQUAT,.SETUP,.$TYPOCT,.$TYPE,.$TRAP,.$POWER,GETPRI
                        .MCALL  NEWTST,.$SCOPE,.$EOP,.$ACT11,.$TYPDEC,COMMENT,ENDCOMMENT

 176000                 $SWR=176000

                        .TITLE  MAINDEC - 11 - DZCDB-A
                        ;*COPYRIGHT (C) 1976
                        ;*DIGITAL EQUIPMENT CORP.
                        ;*MAYNARD, MASS. 01754
                        ;*
                        ;*PROGRAM BY B. BURGESS
                        ;*
                        ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
                        ;*PACKAGE (MAINDEC-11-DZQAC-B1),AUG 29,1975.
                        ;*
 000001                 $TN=1

                                ;COPYRIGHT (C) 1976
                                ;DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.

                                ;THIS SOFTWARE IS FURNISHED UNDER A LICENSE FOR USE ONLY
                                ;ON A SINGLE COMPUTER SYSTEM AND MAY BE COPIED ONLY WITH
                                ;THE INCLUSION OF THE ABOVE COPYRIGHT NOTICE.  THIS
                                ;SOFTWARE, OR ANY OTHER COPIES THEREOF, MAY NOT BE PROVIDED
                                ;OR OTHERWISE MADE AVAILABSLE TO ANY OTHER PERSON EXCEPT
                                ;FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE
                                ;LICENSE TERMS.  TITLE TO AND OWNERSHIP OF THE SOFTWARE SHALL
                                ;AT ALL TIMES REMAIN IN DEC.

                                ;THE INFORMATION IN THIS DOCUMENT IS SUBJECT TO CHANGE
                                ;WITHOUT NOTICE AND SHOULD NOT BE CONSTRUED AS A COMMITMENT
                                ;BY DIGITAL EQUIPMENT CORPORATION.

                                ;DEC ASSUMES NO RESPONSIBILITY FOR THE USE OR RELIABILITY
                                ;OF ITS SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY
                                ;DEC.
```

```
                        .SBTTL          OPERATOR PROCEDURES

;STARTING ADDRESSES ARE:
;       200=INSTRUCTION AND DATA TEST FOR THE CD11
;       210=ERROR FUNCTION TEST OF CD11 (M-1000/M-200)
;       220=SINGLE TEST LOOP
;       240=READ SINGLE DATA PATTERN TEST
;       250=ERROR FUNCTION TEST FOR CD11 (M-1200)

;SWITCH REGISTER SETTINGS FOR THE INSTRUCTION AND DATA TEST ARE:
;       SW02=1 RUN IN DATA IMAGE MODE ONLY
;       SW03=1 RUN IN DATA PACKING MODE ONLY (IGNORED IF SW02=1)
;       SW04=1 FOR THE BINARY TEST DECK
;       SW05=1 TO HALT AT THE END OF A STANDARD 80 CARD
;              TEST DECK.(HITTING CONTINUE WILL START TESTING
;              OF THE NEXT DECK IN ACCORDANCE WITH CURRENT
;              SWR SETTINGS).
;          =0 TO CONTINUE FROM ONE DECK TO THE NEXT.
;              AFTER THE LAST DECK IN THE HOPPER IS
;              RUN, THE PROGRAM WAITS FOR THE CARD READER
;              TO COME BACK ON-LINE,AND RUNS THRU
;              A SERIES OF CHECKS OF OFF-LINE AND
;              COMING ON-LINE OPERATIONS OF THE READER.
;              WHEN THE READER IS BACK ON-LINE AND THE
;              CHECKS ARE COMPLETE, THE DATA TEST IS RESUMED.
;       SW06=1 TO RUN THE COMBINED INSTRUCTION AND DATA TEST
;              WHEN CONTINUING FROM ONE DECK TO THE NEXT
;          =0 TO RUN ONLY THE DATA TEST ON EVERY DECK AFTER THE FIRST
;       SW07=1 TO RUN ONLY THE INSTRUCTION TEST CONTINUALLY.
;              SETTING SW06 AND SW07 AT THE END OF A DECK WILL
;              CAUSE THE INSTRUCTION TEST TO BE RUN CONTINUOUSLY FROM THEN ON
;              (NOTE THAT IF SW7 IS SET, THE PROGRAM MAY HANG WHEN THE
;              CARD READER RUNS OUT OF CARDS)
;       SW11=1 TO INHIBIT SUBPROGRAM ITERATION
;              (NOTE THAT IF PROGRAM FLOW IS ALLOWED TO ENTER THE
;              DATA SUBTEST WHEN SW11 IS SET, DATA ERRORS WILL
;              OCCUR SINCE THE CARD COUNT WILL BE INCORRECT.)
;       SW12=1 TO INHIBIT TRACE TRAPPING
;       SW13=1 TO INHIBIT PRINTOUT
;       SW14=1 FOR SCOPE LOOP & LOOP ON TEST
;       SW15=1 TO HALT ON ERROR

;OPERATING PROCEDURE FOR THE INSTRUCTION AND DATA TEST:
;       1.  LOAD TEST DECK IN CARD READER AND PRESS "START" ON THE CARD
;           READER.  IF THE DECK BEING USED IS NOT A STANDARD TEST
;           DECK, ONLY THE INSTRUCTION PORTION OF THE TEST CAN BE RUN.
;           (SW7 MUST BE SET TO ONE TO INDICATE THIS).
;       2.  LOAD SA 200, THEN SET THE SWITCH REGISTER SWITCHES TO THE DESIRED
;           COMBINATION
;       3.  PRESS "START" ON THE CONSOLE
;       4.  NOTE THAT RUNNING THE COMPLETE INSTRUCTION TEST
;           REQUIRES THAT THE INPUT HOPPER MUST RUN OUT OF CARDS
```

```
                        ;           AT THE END OF A TEST DECK AT LEAST ONCE.  WHEN THIS
                        ;           OCCURS, THE PROCESSOR SHOULD CONTINUE TO RUN.  LOADING
                        ;           A DECK INTO THE INPUT HOPPER AND PRESSING "RESET" ON THE CARD
                        ;           READER SHOULD CAUSE THE BELL TO RING AND THE CARD
                        ;           READER TO RESUME READING CARDS.  IF THIS DOES NOT OCCUR,
                        ;           IT IS A FAULT AND SHOULD BE FIXED.


                        ;SPECIAL SWITCH REGISTER SETTINGS FOR THE ERROR FUNCTION TEST:
                        ;       SW14=1 TO LOOP THRU THE CURRENT SUBTEST
                        ;       SW15=1 TO HALT ON ERROR

                        ;OPERATING PROCEDURE FOR THE ERROR FUNCTION TEST:
                        ;       1.  LOAD A FEW SPARE CARDS INTO THE INPUT HOPPER.
                        ;       2.  PRESS "RESET" ON THE CARD READER.
                        ;       3.  LOAD THE SA, THEN SET THE DESIRED SWITCH OPTIONS.
                        ;       4.  PRESS "START" ON THE CONSOLE.
                        ;       5.  FOLLOW THE INSTRUCTIONS AS THEY ARE PRINTED OUT.

                        ;SINGLE TEST LOOP (SA 220) HALTS TWICE!
                        ;       1ST HALT - LOAD STARTING ADDRESS OF DESIRED TEST (TEST1 TO TEST 22)
                        ;       2ND HALT - SET SWR OPTIONS (BIT 11 MUST = 0)
                        ;       THIS TEST USES TRACE TRAPPING WHERE APPLICABLE IF SW12 IS NOT SET

                        ;DESCRIPTION OF SINGLE DATA PATTERN TEST
                        ;       THIS TEST IS DESIGNED TO AID IN THE LOCATION OF DIFFICULT DATA ERROR
                        ;       PROBLEMS AND PERHAPS HELP IN SOME CARD READER ADJUSTMENTS.  IT
                        ;       CONTINUOUSLY READS CARDS WHICH HAVE ALL COLUMNS PUNCHED OR MARKED
                        ;       IDENTICALLY, CHECKING THE DATA AGAINST A PATTERN SET UP ON THE SWITCHES
                        ;       INITIALLY. ANY ERRORS ARE PRINTED OUT, ALONG WITH A COUNT OF THE TOTAL
                        ;       NUMBER OF CARDS READ AND THE TOTAL NUMBER OF DATA ERRORS WHICH HAVE
                        ;       OCCURRED SINCE THE TEST WAS STARTED.

                        ;OPERATING PROCEDURE FOR SINGLE DATA PATTERN TEST:
                        ;       1.  LOAD TEST DECK OF IDENTICAL CARDS IN THE INPUT HOPPER, AND PUT
                        ;           THE CARD READER ON-LINE (I.E. - PRESS "RESET" ON CARD READER).
                        ;       2.  LOAD SA 240, THEN PRESS "START" ON THE CONSOLE.
                        ;       3.  AT THE INITIAL HALT SET THE CORRECT CARD-IMAGE
                        ;           DATA PATTERN IN SW11-SW00, THEN PRESS CONTINUE.
                        ;       4.  WHEN THE READER RUNS OUT OF CARDS IT WILL RING THE
                        ;           BELL.  RELOADING THE DECK AND PRESSING "RESET" ON THE CARD
                        ;           READER WILL CONTINUE THE TEST.
```

```
                        ;*****************************************************************
                        ;STATUS AND CONTROL REGISTER (CDST) BIT DESIGNATIONS
                        ;       BIT 0   READ
                        ;       BIT 1   DATA PACKING
                        ;       BIT 2   HOPPER EMPTY
                        ;       BIT 3   READER TRANSITION TO ON LINE
                        ;       BIT 4   ADDRESS BIT 16
                        ;       BIT 5   ADDRESS BIT 17
                        ;       BIT 6   INTERRUPT ENABLE
                        ;       BIT 7   CONTROLLER READY
                        ;       BIT 8   POWER CLEAR
                        ;       BIT 9   NON-EXISTENT MEMORY
                        ;       BIT 10  DATA LATE
                        ;       BIT 11  DATA ERROR
                        ;       BIT 12  OFF-LINE
                        ;       BIT 13  END OF FILE (M1200 ONLY)
                        ;       BIT 14  CARD READER ERROR
                        ;       BIT 15  ERROR
                        ;*****************************************************************



                        .SBTTL  BASIC DEFINITIONS

                        ;*INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***
001100                  STACK=  1100
                        .EQUIV  EMT,ERROR       ;;BASIC DEFINITION OF ERROR CALL
                        .EQUIV  IOT,SCOPE       ;;BASIC DEFINITION OF SCOPE CALL
177776                  PS=     177776          ;;PROCESSOR STATUS WORD
                        .EQUIV  PS,PSW
177774                  STKLMT= 177774          ;;STACK LIMIT REGISTER
177772                  PIRQ=   177772          ;;PROGRAM INTERRUPT REQUEST REGISTER
177570                  DSWR=   177570          ;;HARDWARE SWITCH REGISTER
177570                  DDISP=  177570          ;;HARDWARE DISPLAY REGISTER

                        ;*GENERAL PURPOSE REGISTER DEFINITIONS
000000                  R0=     %0              ;;GENERAL REGISTER
000001                  R1=     %1              ;;GENERAL REGISTER
000002                  R2=     %2              ;;GENERAL REGISTER
000003                  R3=     %3              ;;GENERAL REGISTER
000004                  R4=     %4              ;;GENERAL REGISTER
000005                  R5=     %5              ;;GENERAL REGISTER
000006                  R6=     %6              ;;GENERAL REGISTER
000007                  R7=     %7              ;;GENERAL REGISTER
                        .EQUIV  R6,SP           ;;STACK POINTER
```

```
                                .EQUIV  R7,PC           ;;PROGRAM COUNTER
                                ;*PRIORITY LEVEL DEFINITIONS
000000                          PR0=    0               ;;PRIORITY LEVEL 0
000040                          PR1=    40              ;;PRIORITY LEVEL 1
000100                          PR2=    100             ;;PRIORITY LEVEL 2
000140                          PR3=    140             ;;PRIORITY LEVEL 3
000200                          PR4=    200             ;;PRIORITY LEVEL 4
000240                          PR5=    240             ;;PRIORITY LEVEL 5
000300                          PR6=    300             ;;PRIORITY LEVEL 6
000340                          PR7=    340             ;;PRIORITY LEVEL 7

                                ;*"SWITCH REGISTER" SWITCH DEFINITIONS
100000                          SW15=   100000
040000                          SW14=   40000
020000                          SW13=   20000
010000                          SW12=   10000
004000                          SW11=   4000
002000                          SW10=   2000
001000                          SW09=   1000
000400                          SW08=   400
000200                          SW07=   200
000100                          SW06=   100
000040                          SW05=   40
000020                          SW04=   20
000010                          SW03=   10
000004                          SW02=   4
000002                          SW01=   2
000001                          SW00=   1
                                .EQUIV  SW09,SW9
                                .EQUIV  SW08,SW8
                                .EQUIV  SW07,SW7
                                .EQUIV  SW06,SW6
                                .EQUIV  SW05,SW5
                                .EQUIV  SW04,SW4
                                .EQUIV  SW03,SW3
                                .EQUIV  SW02,SW2
                                .EQUIV  SW01,SW1
                                .EQUIV  SW00,SW0

                                ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
100000                          BIT15=  100000
040000                          BIT14=  40000
020000                          BIT13=  20000
010000                          BIT12=  10000
004000                          BIT11=  4000
002000                          BIT10=  2000
001000                          BIT09=  1000
000400                          BIT08=  400
000200                          BIT07=  200
000100                          BIT06=  100
000040                          BIT05=  40
000020                          BIT04=  20
000010                          BIT03=  10
```

```
                        BIT02=  4
                        BIT01=  2
                        BIT00=  1
                        .EQUIV  BIT09,BIT9
                        .EQUIV  BIT08,BIT8
                        .EQUIV  BIT07,BIT7
                        .EQUIV  BIT06,BIT6
                        .EQUIV  BIT05,BIT5
                        .EQUIV  BIT04,BIT4
                        .EQUIV  BIT03,BIT3
                        .EQUIV  BIT02,BIT2
                        .EQUIV  BIT01,BIT1
                        .EQUIV  BIT00,BIT0

                        ;*BASIC "CPU" TRAP VECTOR ADDRESSES
                        ERRVEC= 4               ;;TIME OUT AND OTHER ERRORS
                        RESVEC= 10              ;;RESERVED AND ILLEGAL INSTRUCTIONS
                        TBITVEC=14              ;;"T" BIT
                        TRTVEC= 14              ;;TRACE TRAP
                        BPTVEC= 14              ;;BREAKPOINT TRAP (BPT)
                        IOTVEC= 20              ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
                        PWRVEC= 24              ;;POWER FAIL
                        EMTVEC= 30              ;;EMULATOR TRAP (EMT) **ERROR**
                        TRAPVEC=34              ;;"TRAP" TRAP
                        TKVEC=  60              ;;TTY KEYBOARD VECTOR
                        TPVEC=  64              ;;TTY PRINTER VECTOR
                        PIRQVEC=240             ;;PROGRAM INTERRUPT REQUEST VECTOR

                        ;SPECIAL EQUATES
                                DUMMY=  0
                                ADINT=  %2              ;CONTAINS ADDRESS OF INTERRUPT VECTOR
                                CDS=    %3              ;CONTAINS ADDRESS OF CARD READER STATUS REGISTER
                                CDC=    %4              ;CONTAINS ADDRESS OF CARD READER COLUMN COUNT
                                CDA=    %5              ;CONTAINS ADDRESS OF CARD READER BUS ADDRESS REG.
                                TTY=    %5
                                TRACE=  360


                        .SBTTL  TRAP CATCHER

                                .=0
                        ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
                        ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
                        ;*LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
                                .=174
000174  000000                  DISPREG: .WORD  0               ;;SOFTWARE DISPLAY REGISTER
000176  000000                  SWREG:   .WORD  0               ;;SOFTWARE SWITCH REGISTER

                        .SBTTL  STARTING ADDRESS(ES)
000200  000137  002170          JMP     @#BEGIN         ;;JUMP TO STARTING ADDRESS OF PROGRAM

                        ;*****************************************************************

                        .SBTTL  ACT11 HOOKS
```

```
                                ;HOOKS REQUIRED BY ACT11
000204                                  $SVPC=.                 ;SAVE PC
000046                                  .=46
000046  015012                          $ENDAD                  ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
000052                                  .=52
000052  020000                          .WORD   20000           ;;2)SET LOC.52 TO 20000
000204                                  .=$SVPC                 ;; RESTORE PC

000014                                  .=14
000014  001242                          .WORD   TRTRAP
000016  000340                          .WORD   340

                                ;ADDITIONAL STARTING ADDRESSES

000210                                  .=210
000210  000137  015602                  JMP     ERCD11                  ;FOR CD11 (M1000/M200) ERROR FUNCTION TESTS

000220                                  .=220
000220  000137  023576                  JMP     TESTX                   ;FOR LOOP WHICH WILL CONTINUTALLY RUN
                                                                        ;ANY SINGLE SUBTEST

000240                                  .=240
000240  000137  024322                  JMP     CKSAME                  ;TO READ A SINGLE DATA PATTERN
                                                                        ;CONTINUOUSLY

000250                                  .=250
000250  000137  015306                  JMP     ER1200                  ;FOR CD11 (M1200) ERROR FUNCTION TEST
```

```
                                ;*****************************************************************

                                .SBTTL  COMMON TAGS

                                ;*THIS TABLE CONTAINS VARIOUS COMMON STORAGE LOCATIONS
                                ;*USED IN THE PROGRAM.

                    001100                  .=1100
001100                          $CMTAG:                 ;;START OF COMMON TAGS
001100  000000                  $PASS:  .WORD   0        ;;CONTAINS PASS COUNT
001102  000                     $TSTNM: .BYTE   0        ;;CONTAINS THE TEST NUMBER
001103  000                     $ERFLG: .BYTE   0        ;;CONTAINS ERROR FLAG
001104  000000                  $ICNT:  .WORD   0        ;;CONTAINS SUBTEST ITERATION COUNT
001106  000000                  $LPADR: .WORD   0        ;;CONTAINS SCOPE LOOP ADDRESS
001110  000000                  $LPERR: .WORD   0        ;;CONTAINS SCOPE RETURN FOR ERRORS
001112  000000                  $ERTTL: .WORD   0        ;;CONTAINS TOTAL ERRORS DETECTED
001114  000                     $ITEMB: .BYTE   0        ;;CONTAINS ITEM CONTROL BYTE
001115  001                     $ERMAX: .BYTE   1        ;;CONTAINS MAX. ERRORS PER TEST
001116  000000                  $ERRPC: .WORD   0        ;;CONTAINS PC OF LAST ERROR INSTRUCTION
001120  000000                  $GDADR: .WORD   0        ;;CONTAINS ADDRESS OF 'GOOD' DATA
001122  000000                  $BDADR: .WORD   0        ;;CONTAINS ADDRESS OF 'BAD' DATA
001124  000000                  $GDDAT: .WORD   0        ;;CONTAINS 'GOOD' DATA
001126  000000                  $BDDAT: .WORD   0        ;;CONTAINS 'BAD' DATA
001130  000000                          .WORD   0        ;;RESERVED--NOT TO BE USED
001132  000000                          .WORD   0
001134  000000                          .WORD   0
001136  177570                  SWR:    .WORD   DSWR     ;;ADDRESS OF SWITCH REGISTER
001140  177570                  DISPLAY: .WORD  DDISP    ;;ADDRESS OF DISPLAY REGISTER
001142  177560                  $TKS:   177560           ;;TTY KBD STATUS
001144  177562                  $TKB:   177562           ;;TTY KBD BUFFER
001146  177564                  $TPS:   177564           ;;TTY PRINTER STATUS REG. ADDRESS
001150  177566                  $TPB:   177566           ;;TTY PRINTER BUFFER REG. ADDRESS
001152     000                  $NULL:  .BYTE   0        ;;CONTAINS NULL CHARACTER FOR FILLS
001153     002                  $FILLS: .BYTE   2        ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
001154     012                  $FILLC: .BYTE   12       ;;INSERT FILL CHARS. AFTER A "LINE FEED"
001155     000                  $TPFLG: .BYTE   0        ;;"TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
001156  000000                  $REGAD: .WORD   0        ;;CONTAINS THE ADDRESS FROM
                                                         ;;WHICH  ($REG0) WAS OBTAINED
001160  000000                  $REG0:  .WORD   0        ;;CONTAINS (($REGAD)+0)
001162  000000                  $REG1:  .WORD   0        ;;CONTAINS (($REGAD)+2)
001164  000000                  $REG2:  .WORD   0        ;;CONTAINS (($REGAD)+4)
001166  000000                  $REG3:  .WORD   0        ;;CONTAINS (($REGAD)+6)
001170  000000                  $REG4:  .WORD   0        ;;CONTAINS (($REGAD)+10)
001172  000000                  $REG5:  .WORD   0        ;;CONTAINS (($REGAD)+12)
001174  000000                  $REG6:  .WORD   0        ;;CONTAINS (($REGAD)+14)
001176  000000                  $REG7:  .WORD   0        ;;CONTAINS (($REGAD)+16)
001200  000000                  $TMP0:  .WORD   0        ;;USER DEFINED
001202  000000                  $TMP1:  .WORD   0        ;;USER DEFINED
001204  000000                  $TMP2:  .WORD   0        ;;USER DEFINED
001206  000000                  $TMP3:  .WORD   0        ;;USER DEFINED
001210  000000                  $TMP4:  .WORD   0        ;;USER DEFINED
001212  000000                  $TMP5:  .WORD   0        ;;USER DEFINED
001214  000000                  $TMP6:  .WORD   0        ;;USER DEFINED
001216  000000                  $TMP7:  .WORD   0        ;;USER DEFINED
```

```
   384  001220  000000                 $TIMES: 0                          ;;MAX. NUMBER OF ITERATIONS
   385  001222  177607  000377         $BELL:  .ASCIZ  <207><377><377>    ;;CODE FOR BELL
   386  001226     077                 $QUES:  .ASCII  /?/                ;;QUESTION MARK
   387  001227     015                 $CRLF:  .ASCII  <15>               ;;CARRIAGE RETURN
   388  001230  000012                 $LF:    .ASCIZ  <12>               ;;LINE FEED
```

```
                                ;*****************************************************************
                                ;LOAD POINTERS AND GENERAL STORAGE
001232  177160                  CDST:   177160          ;ADDRESS OF CARD READER STATUS REGISTER #1
                                                        ;THIS REGISTER'S INFORMATION IS VALID
                                                        ;DURING DATA TRANSFERS
001234  177162                  CDCC:   177162          ;ADDRESS OF CARD READER COLUMN COUNT
001236  177164                  CDBA:   177164          ;ADDRESS OF CARD READER BUS ADDRESS
001240  177166                  CDDB:   177166          ;ADDRESS OF CARD READER STATUS REGISTER #2
                                                        ;THIS REGISTER'S INFORMATION IS VALID
                                                        ;DURING NON-DATA TRANSFER PERIODS
001242  000002                  TRTRAP: RTI             ;RETURN FROM TRACE LOOP
001244  000230                  INTVC:  230             ;ADDRESS OF CARD READER INTERRUPT VECTOR
001246  000232                          232
001250  000000                  COUNT:  0               ;USED FOR TIMING, ETC.
001252  000000                  INTFLG: 0               ;CONTAINS LEVEL THAT INTERRUPT IS FOUND AT
001254  000000                  TRFLG:  0               ;TOGGLED TO SWITCH BETWEEN TRACE TRAPPING AND NORMAL FLO
001256  000000                  PROC:   0               ;STORES PROCESSOR STATUS WHEN TRACE TRAP MUST BE CLEARED
                                                        ;IN A SUBTEST
001260  000000                  ERFLG:  0               ;SET TO ZERO TO OUTPUT DATA ERROR HEADING
001262  000000                  CKRF:   0               ;FLAG FOR CHECKERBOARD DECK
001264  000000                  COUNTG: 0               ;USED AS COUNTER IN TESTG
001266  000000                  CD1000: 0               ;M-1200 OR M-1000/M-200 CARD READER DETECTOR

                                .SBTTL  ERROR POINTER TABLE

                                ;*THIS TABLE CONTAINS THE INFORMATION FOR EACH ERROR THAT CAN OCCUR.
                                ;*THE INFORMATION IS OBTAINED BY USING THE INDEX NUMBER FOUND IN
                                ;*LOCATION SITEMB. THIS NUMBER INDICATES WHICH ITEM IN THE TABLE IS PERTINENT.
                                ;*NOTE1:         IF SITEMB IS 0 THE ONLY PERTINENT DATA IS (SERRPC).
                                ;*NOTE2:         EACH ITEM IN THE TABLE CONTAINS 4 POINTERS EXPLAINED AS FOLLOWS:

                                ;*      EM              ;;POINTS TO THE ERROR MESSAGE
                                ;*      DH              ;;POINTS TO THE DATA HEADER
                                ;*      DT              ;;POINTS TO THE DATA
                                ;*      DF              ;;POINTS TO THE DATA FORMAT

001270                          SERRTB:

                                ;ITEM 1

                                        EM1             ;STATUS REGISTER (CDS) BIT07 NOT SET BY
                                                        ;INITIALIZATION PULSE
                                        DH1             ; (PC)   (SP)   (CDS)   (CDD)   (PS)
                                        DT1             ;SERRPC,SREG6 STMP0,STMP1,SREG7
                                        0               ;OCTAL VALUES

                                ;ITEM 2

                                        EM2             ;COLUMN COUNT REGISTER (CDC) NOT CLEARED BY
                                                        ;INITIALIZATION PULSE
                                        DH2             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (PS)
                                        DT2             ;SERRPC,SREG6,STMP0,STMP1,STMP2,SREG7
                                        0               ;OCTAL VALUES
```

```
                                ;ITEM 3
001310  035014                          EM3             ;BUS ADDRESS REGISTER (CDA) NOT CLEARED BY
                                                        ;INITIALIZATION PULSE
001312  042724                          DH3             ; (PC)   (SP)   (CDS)   (CDD)   (CDA)    (PS)
001314  043614                          DT3             ;SERRPC,$REG6,STMP0,STMP1,STMP3,$REG7
001316  000000                          0               ;OCTAL VALUES

                                ;ITEM 4

001320  035114                          EM4             ;STATUS REGISTER CONTENTS INCORRECT
001322  042600                          DH1             ; (PC)   (SP)   (CDS)   (CDD)    (PS)
001324  043562                          DT1             ;SERRPC,$REG6,STMP0,STMP1,$REG7
001326  000000                          0               ;OCTAL VALUES

                                ;ITEM 5

001330  035157                          EM5             ;COLUMN COUNT REGISTER (CDC) NOT ABLE TO
                                                        ;BE LOADED WITH ALL ONE'S
001332  042646                          DH2             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)    (PS)
001334  043576                          DT2             ;SERRPC,$REG6,STMP0,STMP1,STMP2,$REG7
001336  000000                          0               ;OCTAL VALUES

                                ;ITEM 6

001340  035260                          EM6             ;COLUMN COUNT REGISTER (CDC) NOT CLEARED
                                                        ;BY POWER CLEAR
001342  042646                          DH2             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)    (PS)
001344  043576                          DT2             ;SERRPC,$REG6,STMP0,STMP1,STMP2,$REG7
001346  000000                          0               ;OCTAL VALUES

                                ;ITEM 7

001350  035350                          EM7             ;BUS ADDRESS REGISTER (CDA) NOT ABLE TO BE
                                                        ;LOADED WITH ALL ONE'S
001352  042724                          DH3             ; (PC)   (SP)   (CDS)   (CDD)   (CDA)    (PS)
001354  043614                          DT3             ;SERRPC,$REG6,STMP0,STMP1,STMP3,$REG7
001356  000000                          0               ;OCTAL VALUES

                                ;ITEM 10

001360  035450                          EM10            ;BUS ADDRESS REGISTER (CDA) NOT CLEARED
                                                        ;BY POWER CLEAR
001362  042724                          DH3             ; (PC)   (SP)   (CDS)   (CDD)   (CDA)    (PS)
001364  043614                          DT3             ;SERRPC,$REG6,STMP0,STMP1,STMP3,$REG7
001366  000000                          0               ;OCTAL VALUES

                                ;ITEM 11

001370  035537                          EM11            ;CONTROLLER READY DIDN'T CLEAR ON
                                                        ;READING A CARD
001372  042600                          DH1             ; (PC)   (SP)   (CDS)   (CDD)    (PS)
001374  043562                          DT1             ;SERRPC,$REG6,STMP0,STMP1,$REG7
```

```
001376  000000                  0                       ;OCTAL VALUES

                        ;ITEM 12

001400  035621                  EM12                    ;CONTROLLER READY DIDN'T CLEAR BIT00
                                                        ;OF STATUS REGISTER (CDS)
001402  042600                  DH1                     ; (PC)   (SP)   (CDS)   (CDD)    (PS)
001404  043562                  DT1                     ;$ERRPC,$REG6,$TMP0,$TMP1,$REG7
001406  000000                  0                       ;OCTAL VALUES

                        ;ITEM 13

001410  035720                  EM13                    ;CONTROLLER DIDN'T SET WITHIN ONE SECOND
001412  042600                  DH1                     ; (PC)   (SP)   (CDS)   (CDD)    (PS)
001414  043562                  DT1                     ;$ERRPC,$REG6,$TMP0,$TMP1,$REG7
001416  000000                  0                       ;OCTAL VALUES

                        ;ITEM 14

001420  035767                  EM14                    ;ERROR (BIT15) SET IN STATUS REGISTER (CDS)
001422  042600                  DH1                     ; (PC)   (SP)   (CDS)   (CDD)    (PS)
001424  043562                  DT1                     ;$ERRPC,$REG6,$TMP0,$TMP1,$REG7
001426  000000                  0                       ;OCTAL VALUES

                        ;ITEM 15

001430  036042                  EM15                    ;BIT/S SET IN STATUS REGISTER (CDS) THAT
                                                        ;SHOULDN'T BE
001432  042600                  DH1                     ; (PC)   (SP)   (CDS)   (CDD)    (PS)
001434  043562                  DT1                     ;$ERRPC,$REG6,$TMP0,$TMP1,$REG7
001436  000000                  0                       ;OCTAL VALUES

                        ;ITEM 16

001440  036137                  EM16                    ;'BUSY' SET IN STATUS REGISTER (CDS)
                                                        ;SHOULDN'T BE
001442  042600                  DH1                     ; (PC)   (SP)   (CDS)   (CDD)    (PS)
001444  043562                  DT1                     ;$ERRPC,$REG6,$TMP0,$TMP1,$REG7
001446  000000                  0                       ;OCTAL VALUES

                        ;ITEM 17

001450  036223                  EM17                    ;RESTORING CPU STATUS AFTER READING A CARD
                                                        ;CLEARED CONTROLLER READY IN STATUS REGISTER
001452  042600                  DH1                     ; (PC)   (SP)   (CDS)   (CDD)    (PS)
001454  043562                  DT1                     ;$ERRPC,$REG6,$TMP0,$TMP1,$REG7
001456  000000                  0                       ;OCTAL VALUES

                        ;ITEM 20

001460  036352                  EM20                    ;NO INTERRUPT OCCURRED
001462  043002                  DH4                     ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001464  043632                  DT4                     ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001466  000000                  0                       ;OCTAL VALUES
```

```
                                        ;ITEM 21
001470  036400                                EM21            ;AN INTERRUPT OCCURRED - SHOULDN'T HAVE
001472  043002                                DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001474  043632                                DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001476  000000                                0               ;OCTAL VALUES

                                        ;ITEM 22

001500  036450                                EM22            ;INTERRUPT ALREADY OCCURRED AT A HIGHER LEVEL
001502  043002                                DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001504  043632                                DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001506  000000                                0               ;OCTAL VALUES

                                        ;ITEM 23

001510  036525                                EM23            ;CONTROLLER READY NOT SET
001512  043002                                DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS,
001514  043632                                DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001516  000000                                0               ;OCTAL VALUES

                                        ;ITEM 24

001520  036556                                EM24            ;INTERRUPT ALREADY OCCURRED AT A LOWER LEVEL
001522  043002                                DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001524  043632                                DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001526  000000                                0               ;OCTAL VALUES

                                        ;ITEM 25

001530  036632                                EM25            ;AN INTERRUPT OCCURRED AT TWO DIFFERENT LEVELS
001532  043002                                DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001534  043632                                DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001536  000000                                0               ;OCTAL VALUES

                                        ;ITEM 26

001540  036710                                EM26            ;ERROR (BIT15) NOT SET IN STATUS REGISTER
                                                                ;(CDS) - SHOULD BE
001542  043002                                DH4               (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001544  043632                                DT4             ,$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001546  000000                                0               ;OCTAL VALUES

                                        ;ITEM 27

001550  037005                                EM27            ;NON-EXISTANT MEMORY (BIT09) NOT SET IN
                                                                ;STATUS REGISTER (CDS) - SHOULD BE
001552  043002                                DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001554  043632                                DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001556  000000                                0               ;OCTAL VALUES

                                        ;ITEM 30
```

```
001560  037122                  EM30            ;EXTENDED MEMORY (BIT05) NOT SET IN STATUS
                                                ;REGISTER(CDS)
001562  043002                  DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001564  043632                  DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001566  000000                  0               ;OCTAL VALUES

                        ;ITEM 31

001570  037214                  EM31            ;EXTENDED MEMORY (BIT04) NOT SET IN STATUS
                                                ;REGISTER (CDS)
001572  043002                  DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001574  043632                  DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001576  000000                  0               ;OCTAL VALUES

                        ;ITEM 32

001600  036042                  EM15            ;
001602  043002                  DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001604  043632                  DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001606  000000                  0               ;OCTAL VALUES

                        ;ITEM 33

001610  037306                  EM32            ;CONTENTS OF BUS ADDRESS REGISTER (CDA)
                                                ;INCORRECT
001612  043070                  DH5             ; (PC)  (SP)  (CDS)  (CDD)  (CDC)  (CDA)  (CDA)   (PS)
                                                ;                                   WAS    SHB
001614  043652                  DT5             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$TMP4,$REG7
001616  000000                  0               ;OCTAL VALUES

                        ;ITEM 34

001620  037370                  EM33            ;CONTENTS OF COLUMN COUNT REGISTER (CDC)
                                                ;INCORRECT
001622  043254                  DH6             ; (PC)  (SP)  (CDS)  (CDD)  (CDC)  (CDA)  (CDC)   (PS)
                                                ;                                  WAS    SHB
001624  043652                  DT5             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$TMP4,$REG7
001626  000000                  0               ;OCTAL VALUES

                        ;ITEM 35

001630  037453                  EM34            ;READER OFF-LINE BUT CARD READER ERROR
                                                ;(BIT14) NOT SET IN STATUS REGISTER (CDS)
001632  042600                  DH1             ; (PC)   (SP)   (CDS)   (CDD)    (PS)
001634  043562                  DT1             ;$ERRPC,$REG6,$TMP0,$TMP1,$REG7
001636  000000                  0               ;OCTAL VALUES

                        ;ITEM 36

001640  037573                  EM35            ;NO TRANSITION TO ON-LINE (BIT03) OCCURRED
                                                ;IN STATUS REGISTER (CDS)
001642  042600                  DH1             ; (PC)   (SP)   (CDS)   (CDD)    (PS)
001644  043562                  DT1             ;$ERRPC,$REG6,$TMP0,$TMP1,$REG7
001646  000000                  0               ;OCTAL VALUES
```

```
                                ;ITEM 37
001650  042153                          EM63            ;DISASTEROUS ERROR BUT NO ERROR BITS SET
001652  043002                          DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001654  043632                          DT4             ;$ERRPC,$REG6,STMP0,STMP1,STMP2,STMP3,$REG7
001656  000000                          0               ;OCTAL VALUES

                                ;ITEM 40

001660  037677                          EM36            ;CONTENTS OF STATUS REGISTER #2 (CDD)
                                                        ;INCORRECT
001662  043440                          DH7             ; (PC)   (SP)   (CDS)   (CDD)   (CDD)    (PS)
                                                        ;                       WAS     SHB
001664  043674                          DT6             ;$ERRPC,$REG6,STMP0,STMP1,STMP4,$REG7
001666  000000                          0               ;OCTAL VALUES

                                ;ITEM 41

001670  037756                          EM37            ;NO INTERRUPT WITH PROCESSOR AT LEVEL 0
001672  043002                          DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001674  043632                          DT4             ;$ERRPC,$REG6,STMP0,STMP1,STMP2,STMP3,$REG7
001676  000000                          0               ;OCTAL VALUES

                                ;ITEM 42

001700  040025                          EM40            ;DATA LATE (BIT10) NOT SET IN STATUS
                                                        ;REGISTER (CDS)
001702  043002                          DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001704  043632                          DT4             ;$ERRPC,$REG6,STMP0,STMP1,STMP2,STMP3,$REG7
001706  000000                          0               ;OCTAL VALUES

                                ;ITEM 43

001710  040110                          EM41            ;OFF-LINE (BIT12) NOT SET IN STATUS
                                                        ;REGISTER (CDS)
001712  043002                          DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001714  043632                          DT4             ;$ERRPC,$REG6,STMP0,STMP1,STMP2,STMP3,$REG7
001716  000000                          0               ;OCTAL VALUES

                                ;ITEM 44

001720  040172                          EM42            ;OFF-LINE (BIT12) SET IN STATUS REGISTER
                                                        ;(CDS) - SHOULDN'T BE
001722  043002                          DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001724  043632                          DT4             ;$ERRPC,$REG6,STMP0,STMP1,STMP2,STMP3,$REG7
001726  000000                          0               ;OCTAL VALUES

                                ;ITEM 45

001730  040267                          EM43            ;PICK CHECK (BIT13) NOT SET IN STATUS
                                                        ;REGISTER #2 (CDD)
001732  043002                          DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001734  043632                          DT4             ;$ERRPC,$REG6,STMP0,STMP1,STMP2,STMP3,$REG7
```

```
001736  000000                  0                       ;OCTAL VALUES

                        ;ITEM 46

001740  040356                  EM44                    ;STACK CHECK (BIT12) NOT SET IN STATUS
                                                        ;REGISTER #2 (CDD)
001742  043002                  DH4                     ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001744  043632                  DT4                     ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001746  000000                  0                       ;OCTAL VALUES

                        ;ITEM 47

001750  040446                  EM45                    ;END OF FILE (BIT13) SET IN STATUS
                                                        ;REGISTER (CDS) - SHOULDN'T BE
001752  043002                  DH4                     ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001754  043632                  DT4                     ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001756  000000                  0                       ;OCTAL VALUES

                        ;ITEM 50

001760  040554                  EM46                    ;READ CHECK (BIT14) SET IN STATUS
                                                        ;REGISTER (CDS) - SHOULDN'T BE
001762  043002                  DH4                     ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001764  043632                  DT4                     ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001766  000000                  0                       ;OCTAL VALUES

                        ;ITEM 51

001770  040661                  EM47                    ;HOPPER CHECK (BIT02) SET IN STATUS
                                                        ;REGISTER (CDS) - SHOULDN'T BE
001772  043002                  DH4                     ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001774  043632                  DT4                     ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001776  000000                  0                       ;OCTAL VALUES

                        ;ITEM 52

002000  040770                  EM50                    ;END OF FILE (BIT13) OF STATUS REGISTER
                                                        ;(CDS) NOT SET - SHOULD BE
002002  043002                  DH4                     ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
002004  043632                  DT4                     ;$ERRPC,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
002006  000000                  0                       ;OCTAL VALUES

                        ;ITEM 53

002010  041076                  EM51                    ;READ CHECK (BIT14) OF STATUS REGISTER
                                                        ;(CDS) NOT SET- SHOULD BE
002012  043002                  DH4                     ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
002014  043632                  DT4                     ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
002016  000000                  0                       ;OCTAL VALUES

                        ;ITEM 54

002020  041203                  EM52                    ;HOPPER CHECK (BIT12) OF STATUS REGISTER
                                                        ;CDS) NOT SET - SHOULD BE
```

```
                                        DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
002024  043632                          DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
002026  000000                          0               ;OCTAL VALUES

                                ;ITEM 55

002030  041312                          EM53            ;END OF FILE (BIT13) OF STATUS REGISTER
                                                        ;(CDS) DIDN'T CLEAR WITH TRANSITION
                                                        ;TO ON-LINE
002032  043002                          DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
002034  043632                          DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
002036  000000                          0               ;OCTAL VALUES

                                ;ITEM 56

002040  041441                          EM54            ;READ CHECK (BIT14) NOT SET IN STATUS
                                                        ;REGISTER #2 (CDD)
002042  043002                          DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
002044  043632                          DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3.$REG7
002046  000000                          0               ;OCTAL VALUES

                                ;ITEM 57

002050  041530                          EM55            ;CARD READER ERROR BUT NO BOTH CARD
002052  043002                          DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
002054  043632                          DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
002056  000000                          0               ;OCTAL VALUES

                                ;ITEM 60

002060  041574                          EM56            ;CARD READER ERROR BUT READER NOT OFF-LINE
002062  043002                          DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
002064  043632                          DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
002066  000000                          0               ;OCTAL VALUES

                                ;ITEM 61

002070  041637                          EM57            ;END OF FILE ERROR (BIT13) OF STATUS
                                                        ;REGISTER (CDS)
002072  043002                          DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
002074  043632                          DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
002076  000000                          0               ;OCTAL VALUES

                                ;ITEM 62

002100  041722                          EM60            ;DATA ERROR (BIT11) OF STATUS REGISTER (CDS)
002102  043002                          DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
002104  043632                          DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
002106  000000                          0               ;OCTAL VALUES

                                ;ITEM 63

002110  041776                          EM61            ;DATA LATE ERROR (BIT10) OF STATUS
                                                        ;REGISTER (CDS)
```

```
821  002112  043002                  DH4          ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
822  002114  043632                  DT4          ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
823  002116  000000                  0            ;OCTAL VALUES
824
825                                ;ITEM 64
826
827  002120  042057                  EM62         ;NON-EXISTANT MEMORY ERROR (BIT09) OF
828                                                ;STATUS REGISTER (CDS)
829  002122  043002                  DH4          ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
830  002124  043632                  DT4          ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
831  002126  000000                  0            ;OCTAL VALUES
832
833                                ;ITEM 65
834
835  002130  042223                  EM64         ;DATA PACKING (BIT01) OF STATUS REGISTER
836                                                ;(CDS) NOT SET - IT SHOULD BE
837  002132  043002                  DH4          ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
838  002134  043632                  DT4          ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
839  002136  000000                  0            ;OCTAL VALUES
840
841                                ;ITEM 66
842
843  002140  042331                  EM65         ;SHOULD BE ADDRESSING BINARY DECK -
844                                                ;PROGRAM DOESN'T AGREE
845  002142  043002                  DH4          ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
846  002144  043632                  DT4          ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
847  002146  000000                  0            ;OCTAL VALUES
848
849                                ;ITEM 67
850
851  002150  042422                  EM66         ;CONTENTS OF STATUS REGISTER (CDS)
852                                                ;INCORRECT - SHOULD BE ZERO
853  002152  042600                  DH1          ; (PC)   (SP)   (CDS)   (CDD)    (PS)
854  002154  043562                  DT1          ;$ERRPC,$REG6,$TMP0,$TMP1,$REG7
855  002156  000000                  0            ;OCTAL VALUES
856
857                                ;ITEM 70
858
859  002160  042521                  EM67         ;ODD BUS ADDRESS CAUSED A TRAP IN
860                                                ;NON-PACK MODE
861  002162  043002                  DH4          ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
862  002164  043632                  DT4          ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
863  002166  000000                  0            ;OCTAL VALUES
864
```

```
                                                
                                                
                                                
002170                          BEGIN:
002170  012706  001100                  MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
002174  005026                          CLR     (R6)+           ;;CLEAR MEMORY LOCATION
002176  022706  001126                  CMP     #$BDDAT,R6      ;;DONE?
002202  001374                          BNE     .-6             ;;LOOP BACK IF NO
002204  012706  001100                  MOV     #STACK,SP       ;;SETUP THE STACK POINTER
002210  012737  026024  000020          MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
002216  012737  000340  000022          MOV     #340,@#IOTVEC+2 ;;LEVEL 7
002224  012737  025650  000030          MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
002232  012737  000340  000032          MOV     #340,@#EMTVEC+2 ;;LEVEL 7
002240  012737  027072  000034          MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
002246  012737  000340  000036          MOV     #340,@#TRAPVEC+2;LEVEL 7
002254  012737  027126  000024          MOV     #$PWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
002262  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;LEVEL 7
002270  013737  014740  014732          MOV     $ENDCT,$EOPCT   ;;SETUP END-OF-PROGRAM COUNTER
002276  005037  001220                  CLR     $TIMES          ;;INITIALIZE NUMBER OF ITERATIONS
002302  012737  015104  000014          MOV     #$RTRN,@#TBITVEC ;;SET "T" BIT VECTOR TO $RTRN
002310  012737  000340  000016          MOV     #340,@#TBITVEC+2 ;;LEVEL 7
002316  012737  000002  015104          MOV     #RTI,$RTRN      ;;SET $RTRN TO A RTI
002324  012737  002352  000010          MOV     #65$,@#RESVEC   ;;TRY TO DO A RTT
002332  005046                          CLR     -(SP)           ;;DUMMY PS
002334  012746  002342                  MOV     #64$,-(SP)      ;;AND PC
002340  000006                          RTT                     ;;TRY THE RTT
002342  012737  000006  015104  64$:    MOV     #RTT,$RTRN      ;;RTT IS LEGAL--SET $RTRN TO A RTT
002350  000402                          BR      66$
002352  062706  000010          65$:    ADD     #10,SP          ;;RTT ILLEGAL--CLEAN OFF THE STACK
002356  012737  000012  000010  66$:    MOV     #RESVEC+2,@#RESVEC ;;RESTORE TRAP CATCHER
002364  005037  015112                  CLR     $TBIT           ;;CLEAR "T" BIT SWITCH
002370  012737  002370  001106          MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
002376  013746  000004                  MOV     @#4,-(SP)       ;;SAVE ERROR VECTOR
002402  013746  000006                  MOV     @#6,-(SP)
002406  012737  002422  000004          MOV     #67$,4          ;;SET UP TIME OUT VECTOR
002414  005777  176516                  TST     @SWR            ;;TRY TO REFERENCE HARDWARE SWR
002420  000407                          BR      68$             ;;BRANCH IF NO TIMEOUT TRAP OCCURS
002422  012737  000176  001136  67$:    MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
002430  012737  000174  001140          MOV     #DISPREG,DISPLAY ;;POINT TO SOFTWARE DISPLAY REG
002436  022626                          CMP     (SP)+,(SP)+     ;;RESTORE STACK
002440  012637  000006          68$:    MOV     (SP)+,@#6       ;;RESTORE ERROR VECTOR
002444  012637  000004                  MOV     (SP)+,@#4
002450  012737  002170  027274          MOV     #BEGIN,RETURN           ;SAVE RETURN POINT FOR THIS
                                                                        ;SECTION FOR POWER FAILURE RETURN
002456  004737  043712                  JSR     PC,     SETUP   ;INITIALIZE POINTERS AND FLAGS
002462  104400  030254                  TYPE,   STIMES          ;TYPE MAINDEC TITLE & REV. LEVEL
002466  104400  030314                  TYPE,   STADDR          ;TYPE STARTING ADDRESSES MESSAGE
002472  104400  030754                  TYPE,   MLOGIC          ;INDICATE "ENTERING LOGIC TESTS"
002476  104400  015131                  TYPE,   $ENULL          ;TIME TO FINISH ABOVE MESSAGE
002502  000432                          BR      TST1            ;GO TO INSTRUCTION TESTS
002504  005737  001254          RESTRT: TST     TRFLG           ;CHECK FOR TRACE TRAPPING
002510  001012                          BNE     TRAPX           ;IF SET, TRACE TRAP
002512                          NOTRP:
002512  013746  000340                  MOV     PR7,-(SP)       ;;PUT NEW PS ON STACK
```

```
                                64$:
002516  012746  002524                MOV     #64$,-(SP)      ;;PUT NEW PC ON  STACK
002522  000002                        RTI                     ;; POP NEW PC AND PS
002524
002524  104400  030754                TYPE,   MLOGIC                  ;INDICATE "ENTERING LOGIC TESTS"
002530  104400  015131                TYPE,   $ENULL                  ;TIME TO FINISH ABOVE MESSAGE
002534  000415                        BR      TST1            ;GO TO INSTRUCTION TESTS
002536  104400  030754        TRAPX:  TYPE,   MLOGIC          ;INDICATE "ENTERING LOGIC TESTS"
002542  104400  015131                TYPE,   $ENULL          ;TIME TO FINISH ABOVE MESSAGE
002546  032777  010000  176362        BIT     #10000, @SWR    ;CHECK SW12
002554  001356                        BNE     NOTRP           ;BRANCH IF SET TO CLEAR TRACE BIT
002556  013746  000360                MOV     TRACE,-(SP)     ;;PUT NEW PS ON STACK
002562  012746  002570                MOV     #64$,-(SP)      ;;PUT NEW PC ON  STACK
002566  000002                        RTI                     ;; POP NEW PC AND PS
002570                          64$:

                                ;*****************************************************************
                                ;*TEST 1         TEST FOR INIT. OF ALL REGISTERS
                                ;*****************************************************************
002570  000004                  TST1:   SCOPE
002572  004737  025470                JSR     PC,     CKOFFL  ;CHECK FOR OFF-LINE SET
002576  000005                        RESET                   ;SEND OUT INIT
002600  022713  000200                CMP     #200,   @CDS    ;CHECK FOR STATUS REGISTER BIT 7 SET
002604  001401                        BEQ     1$              ;BRANCH IF OK
002606  104001                        ERROR +1                        ;STATUS REGISTER NOT CORRECTLY INITIALIZED

002610  005714                  1$:     TST     @CDC            ;CHECK FOR COLUMN COUNT CLEARED
002612  001401                        BEQ     2$              ;BR IF OK
002614  104002                        ERROR +2                        ;COLUMN COUNT NOT CLEARED BY INIT

002616  005715                  2$:     TST     @CDA            ;CHECK FOR BUS ADDRESS CLEARED
002620  001401                        BEQ     3$              ;BR IF OK
002622  104003                        ERROR +3                        ;BUS ADDRESS NOT CLEARED BY INIT

002624  005777  176410          3$:     TST     @CDDB                   ;TEST BIT15 OF STATUS REGISTER #2
002630  100011                        BPL     4$                      ;BRANCH IF NOT SET INDICATING
                                                                      ;OLD CD11 CONTROLLER
002632  022777  107777  176400        CMP     #107777,@CDDB           ;IS CONTENTS OF STATUS REGISTER #2
                                                                      ;CORRECT FOR NO ERRORS?
002640  001415                        BEQ     5$                      ;BRANCH IF OK!
002642  012737  107777  001210        MOV     #107777,$TMP4           ;CORRECT CONTENTS OF 'CDD' FOR
                                                                      ;ERROR REPORT
002650  104040                        ERROP +40               ;CONTENTS OF 'CDDB' STATUS REGISTER
                                                                      ;#2 NOT = 107777
002652  000410                        BR      5$              ;GO TO NEXT TEST
002654  022777  007777  176356  4$:   CMP     #007777,@CDDB           ;WE HAVE AN OLD CD11 CONTROLLER!
                                                                      ;IS CONTENTS OF STATUS REGISTER #2
                                                                      ;CORRECT FOR NO ERRORS?
002662  001404                        BEQ     5$                      ;BRANCH IF OK!
002664  012737  007777  001210        MOV     #007777,$TMP4           ;CORRECT CONTENTS OF 'CDD' FOR
                                                                      ;ERROR REPORT
002672  104040                        ERROR +40               ;CONTENTS OF 'CDDB' STATUS REGISTER
                                                                      ;#2 NOT = 007777
002674                          5$:
                                ;*****************************************************************
```

```
                                ;*TEST 2        TEST READ/WRITE OF STATUS REGISTER
                                ;*****************************************************************
002674  000004                TST2:   SCOPE
                                        ;ONLY BITS 1,4,5, AND 6 OF THE STATUS REGISTER SHOULD BE
                                        ;ABLE TO BE SET TO ONE AND READ BACK AS ONE
002676  052713  177376                BIS     #177376,@CDS    ;SET ALL BITS BUT 0 AND 8
002702  022713  000362                CMP     #362,   @CDS    ;ONLY BITS 1,4,5,6, AND 7 SHOULD BE SET
002706  001402                        BEQ     1$              ;BRANCH IF OK
002710  104004                        ERROR +4                        ;STATUS REGISTER DIDN'T CONTAIN 362
002712  000413                        BR      TST3            ;BRANCH AFTER FAILURE

                                        ;CLEARING STATUS REGISTER SHOULD CLEAR BITS 1,4,5, AND 6
002714  005013                1$:     CLR     @CDS            ;CLEAR BITS 1,4,5, AND 6
002716  022713  000200                CMP     #200,   @CDS    ;CHECK FOR ALL BITS CLEAR BUT 7
002722  001401                        BEQ     2$              ;BRANCH IF OK
002724  104004                        ERROR +4                        ;STATUS REGISTER DIDN'T CONTAIN 200

                                        ;SETTING ALL BITS SHOULD DO A POWER CLEAR
002726  012713  177777        2$:     MOV     #177777,@CDS    ;SET ALL BITS OF THE STATUS REGISTER
002732  022713  000200                CMP     #200,   @CDS    ;CHECK FOR ALL BITS CLEAR BUT 7
002736  001401                        BEQ     3$              ;BRANCH IF OK
002740  104004                        ERROR +4                        ;STATUS REGISTER DIDN'T CONTAIN 200

002742                          3$:
                                ;*****************************************************************
                                ;*TEST 3        TEST READ/WRITE OF COLUMN COUNT REGISTER
                                ;*****************************************************************
002742  000004                TST3:   SCOPE
002744  012714  177777                MOV     #177777,@CDC    ;LOAD ALL BITS
002750  022714  177777                CMP     #177777,@CDC    ;TEST TO SEE IF IT CAN BE READ
002754  001401                        BEQ     1$              ;BRANCH IF OK
002756  104005                        ERROR +5                        ;CDCC FAILED TO READ/WRITE

002760  022713  000200        1$:     CMP     #200,   @CDS    ;CHECK STATUS REG
002764  001401                        BEQ     2$              ;BRANCH IF OK
002766  104004                        ERROR +4                        ;STATUS REG CHANGED

002770  052713  000400        2$:     BIS     #400,   @CDS    ;DO A POWER CLEAR
002774  005714                        TST     @CDC            ;CHECK FOR COLUMN COUNT CLEARED
002776  001401                        BEQ     3$              ;BRANCH IF OK
003000  104006                        ERROR +6                        ;COLUMN COUNT NOT CLEARED BY POWER CLEAR

003002  022713  000200        3$:     CMP     #200,   @CDS    ;CHECK STATUS REG
003006  001401                        BEQ     4$              ;BRANCH IF OK
003010  104004                        ERROR +4                        ;STATUS REG CHANGED

003012                          4$:
                                ;*****************************************************************
                                ;*TEST 4        TEST READ/WRITE OF BUS ADDRESS REGISTER
                                ;*****************************************************************
003012  000004                TST4:   SCOPE
003014  012715  177777                MOV     #177777,@CDA    ;LOAD ALL BITS
003020  022715  177777                CMP     #177777,@CDA    ;TEST TO SEE IF IT CAN BE READ
003024  001401                        BEQ     1$              ;BRANCH IF OK
```

```
1027  003026  104007                          ERROR +7                        ;CDBA FAILED TO READ/WRITE
1028
1029  003030  022713  000200          1$:     CMP     #200,   @CDS    ;CHECK STATUS REG
1030  003034  001401                          BEQ     2$              ;BRANCH IF OK
1031  003036  104004                          ERROR +4                        ;STATUS REG CHANGED
1032
1033  003040  052713  000400          2$:     BIS     #400,   @CDS    ;DO A POWER CLEAR
1034  003044  005715                          TST     @CDA            ;CHECK FOR BUS ADDRESS CLEARED
1035  003046  001401                          BEQ     3$              ;BRANCH IF OK
1036  003050  104010                          ERROR +10                       ;BUS ADDRESS NOT CLEARED BY POWER CLEAR
1037
1038  003052  022713  000200          3$:     CMP     #200,   @CDS    ;CHECK STATUS REG
1039  003056  001401                          BEQ     4$              ;BRANCH IF OK
1040  003060  104004                          ERROR +4                        ;STATUS REG CHANGED
1041
1042  003062                          4$:
1043                                  ;*********************************************************************
1044                                  ;*TEST 5        TEST CONTROLLER READY TO CLEAR BIT0
1045                                  ;*********************************************************************
1046  003062  000004                  TST5:   SCOPE
1047                                  ;BIT 0 SHOULD ALWAYS READ AS BEING EQUAL TO ZERO
1048  003064  004737  025470                  JSR     PC,     CKOFFL  ;CHECK FOR OFF-LINE SET
1049  003070  012714  177777                  MOV     #-1,    @CDC    ;SET UP COLUMN COUNT TO READ 1 COLUMN
1050  003074  012715  043766                  MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
1051                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,PROC"
1052  003100  005046                          CLR     -(SP)           ;;
1053  003102  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1054  003106  012737  003116  000034          MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
1055  003114  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
1056  003116  016666  000002  000006  64$:     MOV     2(SP),6(SP)     ;;
1057  003124  012716  003132                  MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
1058  003130  000002                          RTI                     ;;RESTORE PSW
1059  003132  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1060  003136  012637  001256                  MOV     (SP)+,PROC
1061  003142  013746  000000                  MOV     PRO,-(SP)       ;;PUT NEW PS ON STACK
1062  003146  012746  003154                  MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
1063  003152  000002                          RTI                     ;; POP NEW PC AND PS
1064  003154                          66$:
1065  003154  005037  001250                  CLR     COUNT           ;INITIALIZE COUNTER
1066  003160  005213                          INC     @CDS            ;START READING A CARD
1067  003162  105713                          TSTB    @CDS            ;CHECK FOR CONTROLLER READY CLEARED
1068  003164  100001                          BPL     LOOP5           ;BRANCH IF OK
1069  003166  104011                          ERROR +11                       ;CONTROLLER READY DIDN'T CLEAR
1070
1071  003170  032713  000001          LOOP5:  BIT     #1,     @CDS    ;CHECK BIT 0
1072  003174  001402                          BEQ     1$              ;BRANCH IF NOT SET
1073  003176  104012                          ERROR +12                       ;BIT 0 READ AS A ONE
1074  003200  000423                          BR      TST6            ;BRANCH AFTER FAILURE
1075  003202  005237  001250          1$:     INC     COUNT           ;WAIT ABOUT
1076  003206  001370                          BNE     LOOP5
1077  003210  013746  001256                  MOV     PROC,-(SP)      ;;PUT NEW PS ON STACK
1078  003214  012746  003222                  MOV     #64$,-(SP)      ;;PUT NEW PC ON  STACK
1079  003220  000002                          RTI                     ;; POP NEW PC AND PS
1080  003222                          64$:
```

```
1081  003222  105713                          TSTB    @CDS            ;CHECK CONTROLLER READY
1082  003224  100401                          BMI     2$              ;CONTINUE IF  SET
1083  003226  104013                          ERROR +13                       ;CONTROLLER READY DIDN'T SET WITHIN 1 SEC
1084  003230  005713                  2$:     TST     @CDS
1085  003232  100002                          BPL     3$
1086  003234  104014                          ERROR +14                       ;ERROR BIT SET
1087  003236  000404                          BR      TST6
1088  003240  032713  177577        3$:     BIT     #177577,@CDS   ;CHECK FOR ANY OTHER BITS
1089  003244  001401                          BEQ     4$              ;BRANCH IF OK
1090  003246  104015                          ERROR +15                       ;EXTRA BIT(S) SET
1091
1092  003250                          4$:
1093                                  ;*************************************************************
1094                                  ;*TEST 6        TEST BIT2 TO BE CLEAR AFTER CARD READ
1095                                  ;*************************************************************
1096  003250  000004                  TST6:   SCOPE
1097                                  ;IT SHOULD REMAIN NOT SET
1098                                  ;THIS SHOULD HAPPEN WITHIN ABOUT 1 SECOND
1099  003252  004737  025470                  JSR     PC,CKOFFL       ;CHECK FOR OFF-LINE SET
1100  003256  005013                          CLR     @CDS            ;INITIALIZE STATUS REGISTER
1101  003260  012714  177754                  MOV     #-20.,  @CDC    ;SET UP COLUMN COUNT TO READ 20 COLUMNS
1102  003264  012715  043766                  MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
1103  003270  005213                          INC     @CDS            ;READ A CARD
1104  003272  032713  000004                  BIT     #4,@CDS         ;CHECK HOPPER EMPTY
1105  003276  001401                          BEQ     1$
1106  003300  104016                          ERROR +16                       ;HOPPER EMPTY SET
1107  003302  005037  001250          1$:     CLR     COUNT           ;SET UP WAIT COUNTER
1108                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,PROC"
1109  003306  005046                          CLR     -(SP)           ;;
1110  003310  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1111  003314  012737  003324  000034          MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
1112  003322  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
1113  003324  016666  000002  000006  64$:     MOV     2(SP),6(SP)     ;;
1114  003332  012716  003340                  MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
1115  003336  000002                          RTI                     ;;RESTORE PSW
1116  003340  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1117  003344  012637  001256                  MOV     (SP)+,PROC
1118  003350  013746  000000                  MOV     PRO,-(SP)       ;;PUT NEW PS ON STACK
1119  003354  012746  003362                  MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
1120  003360  000002                          RTI                     ;; POP NEW PC AND PS
1121  003362                          66$:
1122  003362  105713                  LOOP6A: TSTB    @CDS            ;CHECK READY
1123  003364  100405                          BMI     LOOP6B          ;BRANCH IF READY
1124  003366  005337  001250                  DEC     COUNT           ;WAIT ABOUT 1 SEC.
1125  003372  001373                          BNE     LOOP6A
1126  003374  104013                          ERROR +13                       ;READING A CARD DIDN'T SET READY
1127  003376  000413                          BR      TST7
1128  003400                          LOOP6B:
1129  003400  013746  001256                  MOV     PROC,-(SP)      ;;PUT NEW PS ON STACK
1130  003404  012746  003412                  MOV     #64$,-(SP)      ;;PUT NEW PC ON  STACK
1131  003410  000002                          RTI                     ;; POP NEW PC AND PS
1132  003412                          64$:
1133  003412  105713                  LOOP6:  TSTB    @CDS            ;CHECK CONTROLLER READY
1134  003414  100401                          BMI     DONE6           ;BRANCH IF SET
```

```
1135  003416  104017                          ERROR +17                       ;RESTORING STATUS RESET READY
1136
1137  003420  005713                  DONE6:  TST     @CDS                    ;CHECK ERROR BIT 15
1138  003422  100001                          BPL     1$                      ;BRANCH IF OK
1139  003424  104014                          ERROR +14                       ;ERROR BIT 15 WAS SET
1140
1141  003426                          1$:
1142                                  ;*********************************************************
1143                                  ;*TEST 7        TEST INTERRUPT FROM CONTROLLER READY
1144                                  ;*********************************************************
1145  003426  000004                  TST7:   SCOPE
1146  003430  004737  025442                  JSR     PC,     INIT    ;INITIALIZE
1147  003434  012712  003710                  MOV     #TINT7,@#0INT   ;LOAD RETURN POINTER
1148                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
1149  003440  005046                          CLR     -(SP)           ;;
1150  003442  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1151  003446  012737  003456  000034          MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
1152  003454  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
1153  003456  016666  000002  000006  64$:    MOV     2(SP),6(SP)     ;;
1154  003464  012716  003472                  MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
1155  003470  000002                          RTI                     ;;RESTORE PSW
1156  003472  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1157  003476  012637  001214                  MOV     (SP)+,$TMP6
1158  003502  052737  000340  001214          BIS     #340,$TMP6
1159  003510  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1160  003514  012746  003522                  MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
1161  003520  000002                          RTI                     ;; POP NEW PC AND PS
1162  003522                          66$:
1163                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(@0INT)"
1164  003522  005046                          CLR     -(SP)           ;;
1165  003524  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1166  003530  012737  003540  000034          MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
1167  003536  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
1168  003540  016666  000002  000006  67$:    MOV     2(SP),6(SP)     ;;
1169  003546  012716  003554                  MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
1170  003552  000002                          RTI                     ;;RESTORE PSW
1171  003554  012637  000034          68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1172  003560  012662  000002                  MOV     (SP)+,2(@0INT)
1173                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
1174  003564  005046                          CLR     -(SP)           ;;
1175  003566  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1176  003572  012737  003602  000034          MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
1177  003600  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
1178  003602  016666  000002  000006  69$:    MOV     2(SP),6(SP)     ;;
1179  003610  012716  003616                  MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
1180  003614  000002                          RTI                     ;;RESTORE PSW
1181  003616  012637  000034          70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1182  003622  012637  001214                  MOV     (SP)+,$TMP6
1183  003626  042737  000340  001214          BIC     #340,$TMP6
1184  003634  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1185  003640  012746  003646                  MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
1186  003644  000002                          RTI                     ;; POP NEW PC AND PS
1187  003646                          71$:
1188  003646  012714  177741                  MOV     #-31.,  @CDC    ;SET UP COLUMN COUNT TO READ 31 COLUMNS
```

```
1189  003652  012715  043766                  MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
1190  003656  012713  000101                  MOV     #101,   @CDS    ;SET INTERRUPT ENABLE AND READ
1191  003662  105713                  1$:     TSTB    @CDS            ;WAIT FOR CONTROLLER READY
1192  003664  100376                          BPL     1$
1193                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV 2(ADINT),PS"
1194  003666  016246  000002                  MOV     2(ADINT),-(SP)  ;;PUT NEW PS ON STACK
1195  003672  012746  003700                  MOV     #72$,-(SP)      ;;PUT NEW PC ON  STACK
1196  003676  000002                          RTI                     ;; POP NEW PC AND PS
1197  003700                          72$:
1198  003700  042713  000100                  BIC     #100,   @CDS    ;CLEAR INTERRUPT ENABLE
1199  003704  104020                          ERROR +20                       ;NO INTERRUPT OCCURRED
1200  003706  000410                          BR      CONT7
1201  003710  105713                  TINT7:  TSTB    @CDS            ;CHECK CONTROLLER READY
1202  003712  100401                          BMI     1$              ;BRANCH IF SET
1203  003714  104023                          ERROR +23               ;CONTROLLER READY NOT SET
1204  003716  022626                  1$:     CMP     (SP)+,  (SP)+   ;RESTORE STACK POINTER
1205  003720  005713                          TST     @CDS            ;MAKE SURE NO ERROR OCCURRED
1206  003722  100001                          BPL     2$
1207  003724  104014                          ERROR +14                       ;BIT 15 WAS SET
1208  003726  005013                  2$:     CLR     @CDS            ;DISABLE INTERRUPTS
1209  003730  012712  000232          CONT7:  MOV     #232,@ADINT     ;CHANGE INTERRUPT RETURN ADDRESS
1210  003734  005037  000232                  CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1211
1212                                  ;*****************************************************************
1213                                  ;*TEST 10       TEST NO INTERRUPT ON CONTROLLER READY & CPU AT LEVEL 7
1214                                  ;*****************************************************************
1215  003740  000004                  TST10:  SCOPE
1216  003742  004737  025442                  JSR     PC,     INIT    ;INITIALIZE
1217  003746  012712  004120                  MOV     #TINT10,@ADINT  ;SETUP RETURN
1218                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
1219  003752  005046                          CLR     -(SP)           ;;
1220  003754  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1221  003760  012737  003770  000034          MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
1222  003766  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
1223  003770  016666  000002  000006  64$:    MOV     2(SP),6(SP)     ;;
1224  003776  012716  004004                  MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
1225  004002  000002                          RTI                     ;;RESTORE PSW
1226  004004  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1227  004010  012637  001214                  MOV     (SP)+,$TMP6
1228  004014  052737  000340  001214          BIS     #340,$TMP6
1229  004022  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1230  004026  012746  004034                  MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
1231  004032  000002                          RTI                     ;; POP NEW PC AND PS
1232  004034                          66$:
1233                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
1234  004034  005046                          CLR     -(SP)           ;;
1235  004036  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1236  004042  012737  004052  000034          MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
1237  004050  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
1238  004052  016666  000002  000006  67$:    MOV     2(SP),6(SP)     ;;
1239  004060  012716  004066                  MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
1240  004064  000002                          RTI                     ;;RESTORE PSW
1241  004066  012637  000034          68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1242  004072  012662  000002                  MOV     (SP)+,2(ADINT)
```

```
1243  004076  012714  177703                MOV     #-61.,  @CDC    ;SET UP COLUMN COUNT TO READ 61 COLUMNS
1244  004102  012715  043766                MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
1245  004106  012713  000101                MOV     #101,   @CDS    ;SET INTERRUPT ENABLE AND READ
1246  004112  105713                1$:     TSTB    @CDS            ;WAIT FOR CONTROLLER READY
1247  004114  100376                        BPL     1$
1248  004116  000402                        BR      T10GO           ;CONTINUE IF NO INTERRUPT OCCURRED
1249  004120  104021                TINT10: ERROR +21                       ;AN INTERRUPT OCCURRED
1250  004122  022626                        CMP     (SP)+,(SP)+     ;RESTORE STACK POINTER
1251  004124  005013                T10GO:  CLR     @CDS            ;CLEAR INTERRUPT ENABLE
1252  004126  012712  000232                MOV     #232,@ADINT     ;CHANGE INTERRUPT RETURN ADDRESS
1253  004132  005037  000232                CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1254
1255                                        ;FIND THE LEVEL AT WHICH AN INTERRUPT OCCURS
1256                                        ;PRINT OUT A MESSAGE STATING THIS LEVEL IF IT IS OTHER THAN THE STANDARD
1257                                        ;(LEVEL 6) MAKE CERTAIN THAT IT ALWAYS OCCURS AT THIS LEVEL
1258                                        ;THE MESSAGE STATING THE LEVEL IS PRINTED ONLY ONCE, AND THE PROGRAM MUST
1259                                        ;BE STARTED OVER AT LOCATION 200 FOR IT TO BE PRINTED AGAIN
1260
1261                                        ;*****************************************************************
1262                                        ;*TEST 11       TEST FOR AN INTERRUPT ON LEVEL 7
1263                                        ;*****************************************************************
1264  004136  000004                T$T11:  SCOPE
1265  004140  004737  025442                JSR     PC,     INIT    ;INITIALIZE
1266  004144  012712  004526                MOV     #T$INT11,@ADINT ;SETUP RETURN ADDRESS
1267                                        ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
1268  004150  005046                        CLR     -(SP)           ;;
1269  004152  013746  000034                MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1270  004156  012737  004166  000034        MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
1271  004164  104400                        TRAP                    ;;PUSH OLD PSW AN PCON STACK
1272  004166  016666  000002  000006 64$:   MOV     2(SP),6(SP)     ;;
1273  004174  012716  004202                MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
1274  004200  000002                        RTI                     ;;RESTORE PSW
1275  004202  012637  000034        65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1276  004206  012637  001214                MOV     (SP)+,$TMP6
1277  004212  052737  000340  001214        BIS     #340,$TMP6
1278  004220  013746  001214                MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1279  004224  012746  004232                MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
1280  004230  000002                        RTI                     ;; POP NEW PC AND PS
1281  004232                         66$:
1282                                        ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
1283  004232  005046                        CLR     -(SP)           ;;
1284  004234  013746  000034                MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1285  004240  012737  004250  000034        MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
1286  004246  104400                        TRAP                    ;;PUSH OLD PSW AN PCON STACK
1287  004250  016666  000002  000006 67$:   MOV     2(SP),6(SP)     ;;
1288  004256  012716  004264                MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
1289  004262  000002                        RTI                     ;;RESTORE PSW
1290  004264  012637  000034        68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1291  004270  012662  000002                MOV     (SP)+,2(ADINT)
1292                                        ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
1293  004274  005046                        CLR     -(SP)           ;;
1294  004276  013746  000034                MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1295  004302  012737  004312  000034        MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
1296  004310  104400                        TRAP                    ;;PUSH OLD PSW AN PCON STACK
```

```
1297  004312  016666  000002  000006  69$:    MOV     2(SP),6(SP)     ;;
1298  004320  012716  004326                  MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
1299  004324  000002                          RTI                     ;;RESTORE PSW
1300  004326  012637  000034          70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1301  004332  012637  001214                  MOV     (SP)+,$TMP6
1302  004336  042737  000340  001214          BIC     #340,$TMP6
1303  004344  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1304  004350  012746  004356                  MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
1305  004354  000002                          RTI                     ;; POP NEW PC AND PS
1306  004356                          71$:
1307  004356  005046                          CLR     -(SP)           ;;
1308  004360  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1309  004364  012737  004374  000034          MOV     #72$,34         ;;SETUP NEW TRAP VECTOT
1310  004372  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
1311  004374  016666  000002  000006  72$:    MOV     2(SP),6(SP)     ;;
1312  004402  012716  004410                  MOV     #73$,(SP)               ;;REPLACE OLD PC WITH NEW
1313  004406  000002                          RTI                     ;;RESTORE PSW
1314  004410  012637  000034          73$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1315  004414  014637  001214                  MOV     -(SP),$TMP6
1316  004420  052737  000300  001214          BIS     #300,$TMP6
1317  004426  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1318  004432  012746  004440                  MOV     #74$,-(SP)      ;;PUT NEW PC ON  STACK
1319  004436  000002                          RTI                     ;; POP NEW PC AND PS
1320  004440                          74$:
1321  004440  012714  177660                  MOV     #-80.,  @CDC    ;SET UP COLUMN COUNT TO READ 80 COLUMNS
1322  004444  012715  043766                  MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
1323  004450  012713  000101                  MOV     #101,   @CDS    ;SET INTERRUPT ENABLE AND READ
1324  004454  105713                  1$:     TSTB    @CDS            ;WAIT FOR CONTROLLER READY
1325  004456  100376                          BPL     1$
1326                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV 2(ADINT),PS"
1327  004460  016246  000002                  MOV     2(ADINT),-(SP)  ;;PUT NEW PS ON STACK
1328  004464  012746  004472                  MOV     #75$,-(SP)      ;;PUT NEW PC ON  STACK
1329  004470  000002                          RTI                     ;; POP NEW PC AND PS
1330  004472                          75$:
1331  004472  005013                          CLR     @CDS            ;DISABLE INTERRUPTS
1332  004474  012712  000232                  MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
1333  004500  005037  000232                  CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1334  004504  005737  001252                  TST     INTFLG          ;TEST FOR A PREVIOUS INTERRUPT
1335  004510  001441                          BEQ     TST12           ;BRANCH IF NONE
1336  004512  023727  001252  100007          CMP     INTFLG, #100007 ;CHECK PREVIOUS LEVEL
1337  004520  100435                          BMI     TST12           ;BRANCH IF LOWER
1338  004522  104022                          ERROR +22                       ;INTERRUPT ALREADY OCCURRED AT LVL 7 OR HIGHER
1339  004524  000433                          BR      TST12
1340  004526  105713                  TINT11: TSTB    @CDS            ;MAKE SURE CONTROLLER READY IS SET
1341  004530  100401                          BMI     1$              ;BRANCH IF SET
1342  004532  104023                          ERROR +23                       ;CONTROLLER READY WASN'T SET
1343  004534  005013                  1$:     CLR     @CDS            ;DISABLE FURTHER INTERRUPTS
1344  004536  012712  000232                  MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
1345  004542  005037  000232                  CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1346  004546  022626                          CMP     (SP)+,  (SP)+   ;RESTORE STACK POINTER
1347  004550  005737  001252                  TST     INTFLG          ;CHECK FOR PREVIOUS FLAG
1348  004554  100412                          BMI     SET7            ;BRANCH IF FLAG SET
1349  004556  012737  100007  001252          MOV     #100007,INTFLG  ;SET FLAG AND LEVEL
1350  004564  104400  031430                  TYPE,   MSG4            ;PRINT MESSAGE "THE INTERRUPT LEVEL WAS"
```

```
1351  004570  012746  000007                    MOV     #7,-(SP)
1352  004574  104402                            TYPOS
1353  004576     001                            .BYTE   1
1354  004577     000                            .BYTE   0
1355  004600  000405                            BR      TST12
1356  004602  023727  001252  100007  SET7: CMP       INTFLG, #100007 ;CHECK PREVIOUS LEVEL
1357  004610  100001                            BPL     TST12
1358  004612  104024                            ERROR +24                       ;INTERRUPT ALREADY OCCURRED AT A LOWER LEVEL
1359                                    ;*****************************************************************
1360                                    ;*TEST 12       TEST FOR AN INTERRUPT ON LEVEL 6
1361                                    ;*****************************************************************
1362  004614  000004                    TST12:  SCOPE
1363  004616  004737  025442                    JSR     PC,     INIT    ;INITIALIZE
1364  004622  012712  005204                    MOV     #TINT12,@ADINT  ;SETUP RETURN ADDRESS
1365                                            ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
1366  004626  005046                            CLR     -(SP)           ;;
1367  004630  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1368  004634  012737  004644  000034            MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
1369  004642  104400                            TRAP                    ;;PUSH OLD PSW AN PCON STACK
1370  004644  016666  000002  000006  64$:     MOV     2(SP),6(SP)     ;;
1371  004652  012716  004660                    MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
1372  004656  000002                            RTI                     ;;RESTORE PSW
1373  004660  012637  000034            65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1374  004664  012637  001214                    MOV     (SP)+,$TMP6
1375  004670  052737  000340  001214            BIS     #340,$TMP6
1376  004676  013746  001214                    MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1377  004702  012746  004710                    MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
1378  004706  000002                            RTI                     ;; POP NEW PC AND PS
1379  004710                            66$:
1380                                            ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
1381  004710  005046                            CLR     -(SP)           ;;
1382  004712  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1383  004716  012737  004726  000034            MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
1384  004724  104400                            TRAP                    ;;PUSH OLD PSW AN PCON STACK
1385  004726  016666  000002  000006  67$:     MOV     2(SP),6(SP)     ;;
1386  004734  012716  004742                    MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
1387  004740  000002                            RTI                     ;;RESTORE PSW
1388  004742  012637  000034            68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1389  004746  012662  000002                    MOV     (SP)+,2(ADINT)
1390                                            ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
1391  004752  005046                            CLR     -(SP)           ;;
1392  004754  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1393  004760  012737  004770  000034            MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
1394  004766  104400                            TRAP                    ;;PUSH OLD PSW AN PCON STACK
1395  004770  016666  000002  000006  69$:     MOV     2(SP),6(SP)     ;;
1396  004776  012716  005004                    MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
1397  005002  000002                            RTI                     ;;RESTORE PSW
1398  005004  012637  000034            70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1399  005010  012637  001214                    MOV     (SP)+,$TMP6
1400  005014  042737  000340  001214            BIC     #340,$TMP6
1401  005022  013746  001214                    MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1402  005026  012746  005034                    MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
1403  005032  000002                            RTI                     ;; POP NEW PC AND PS
1404  005034                            71$:
```

```
1405  005034  005046                          CLR     -(SP)           ;;
1406  005036  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1407  005042  012737  005052  000034          MOV     #72$,34         ;;SETUP NEW TRAP VECTOT
1408  005050  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
1409  005052  016666  000002  000006  72$:    MOV     2(SP),6(SP)     ;;
1410  005060  012716  005066                  MOV     #73$,(SP)               ;;REPLACE OLD PC WITH NEW
1411  005064  000002                          RTI                     ;;RESTORE PSW
1412  005066  012637  000034          73$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1413  005072  014637  001214                  MOV     -(SP),$TMP6
1414  005076  052737  000240  001214          BIS     #240,$TMP6
1415  005104  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1416  005110  012746  005116                  MOV     #74$,-(SP)      ;;PUT NEW PC ON  STACK
1417  005114  000002                          RTI                     ;; POP NEW PC AND PS
1418  005116                          74$:
1419  005116  012714  177660                  MOV     #-80.,  @CDC    ;SET UP COLUMN COUNT TO READ 80 COLUMNS
1420  005122  012715  043766                  MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
1421  005126  012713  000101                  MOV     #101,   @CDS    ;SET INTERRUPT ENABLE AND READ
1422  005132  105713                  1$:     TSTB    @CDS            ;WAIT FOR CONTROLLER READY
1423  005134  100376                          BPL     1$
1424                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV 2(ADINT),PS"
1425  005136  016246  000002                  MOV     2(ADINT),-(SP)  ;;PUT NEW PS ON STACK
1426  005142  012746  005150                  MOV     #75$,-(SP)      ;;PUT NEW PC ON  STACK
1427  005146  000002                          RTI                     ;; POP NEW PC AND PS
1428  005150                          75$:
1429  005150  005013                          CLR     @CDS            ;DISABLE INTERRUPTS
1430  005152  012712  000232                  MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
1431  005156  005037  000232                  CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1432  005162  005737  001252                  TST     INTFLG          ;TEST FOR A PREVIOUS INTERRUPT
1433  005166  001441                          BEQ     TST13           ;BRANCH IF NONE
1434  005170  023727  001252  100006          CMP     INTFLG, #100006 ;CHECK PREVIOUS LEVEL
1435  005176  100435                          BMI     TST13           ;BRANCH IF LOWER
1436  005200  104022                          ERROR +22                       ;INTERRUPT ALREADY OCCURRED AT LVL 6 OR HIGHER
1437  005202  000433                          BR      TST13
1438  005204  105713                  TINT12: TSTB    @CDS            ;MAKE SURE CONTROLLER READY IS SET
1439  005206  100401                          BMI     1$              ;BRANCH IF SET
1440  005210  104023                          ERROR +23                       ;CONTROLLER READY WASN'T SET
1441  005212  005013                  1$:     CLR     @CDS            ;DISABLE FURTHER INTERRUPTS
1442  005214  012712  000232                  MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
1443  005220  005037  000232                  CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1444  005224  022626                          CMP     (SP)+,  (SP)+   ;RESTORE STACK POINTER
1445  005226  005737  001252                  TST     INTFLG          ;CHECK FOR PREVIOUS FLAG
1446  005232  100412                          BMI     SET6            ;BRANCH IF FLAG SET
1447  005234  012737  100006  001252          MOV     #100006,INTFLG  ;SET FLAG AND LEVEL
1448  005242  104400  031430                  TYPE,   MSG4            ;PRINT MESSAGE "THE INTERRUPT LEVEL WAS"
1449  005246  012746  000006                  MOV     #6,-(SP)
1450  005252  104402                          TYPOS
1451  005254     001                          .BYTE   1
1452  005255     000                          .BYTE   0
1453  005256  000405                          BR      TST13
1454  005260  023727  001252  100006  SET6: CMP     INTFLG, #100006 ;CHECK PREVIOUS LEVEL
1455  005266  100001                          BPL     TST13
1456  005270  104024                          ERROR +24                       ;INTERRUPT ALREADY OCCURRED AT A LOWER LEVEL
1457                                  ;*********************************************************
1458                                  ;*TEST 13        TEST FOR AN INTERRUPT ON LEVEL 5
```

```
1459                                    ;*****************************************************************
1460  005272  000004                    TST13:  SCOPE
1461  005274  004737  025442                    JSR     PC,     INIT    ;INITIALIZE
1462  005300  012712  005662                    MOV     #TINT13,@ADINT  ;SETUP RETURN ADDRESS
1463                                    ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
1464  005304  005046                    CLR     -(SP)           ;;
1465  005306  013746  000034            MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1466  005312  012737  005322  000034    MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
1467  005320  104400                    TRAP                    ;;PUSH OLD PSW AN PCON STACK
1468  005322  016666  000002  000006  64$:   MOV     2(SP),6(SP)     ;;
1469  005330  012716  005336                    MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
1470  005334  000002                    RTI                     ;;RESTORE PSW
1471  005336  012637  000034          65$:   MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1472  005342  012637  001214                    MOV     (SP)+,$TMP6
1473  005346  052737  000340  001214            BIS     #340,$TMP6
1474  005354  013746  001214                    MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1475  005360  012746  005366                    MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
1476  005364  000002                    RTI                     ;; POP NEW PC AND PS
1477  005366                          66$:
1478                                    ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
1479  005366  005046                    CLR     -(SP)           ;;
1480  005370  013746  000034            MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1481  005374  012737  005404  000034    MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
1482  005402  104400                    TRAP                    ;;PUSH OLD PSW AN PCON STACK
1483  005404  016666  000002  000006  67$:   MOV     2(SP),6(SP)     ;;
1484  005412  012716  005420                    MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
1485  005416  000002                    RTI                     ;;RESTORE PSW
1486  005420  012637  000034          68$:   MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1487  005424  012662  000002                    MOV     (SP)+,2(ADINT)
1488                                    ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
1489  005430  005046                    CLR     -(SP)           ;;
1490  005432  013746  000034            MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1491  005436  012737  005446  000034    MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
1492  005444  104400                    TRAP                    ;;PUSH OLD PSW AN PCON STACK
1493  005446  016666  000002  000006  69$:   MOV     2(SP),6(SP)     ;;
1494  005454  012716  005462                    MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
1495  005460  000002                    RTI                     ;;RESTORE PSW
1496  005462  012637  000034          70$:   MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1497  005466  012637  001214                    MOV     (SP)+,$TMP6
1498  005472  042737  000340  001214            BIC     #340,$TMP6
1499  005500  013746  001214                    MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1500  005504  012746  005512                    MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
1501  005510  000002                    RTI                     ;; POP NEW PC AND PS
1502  005512                          71$:
1503  005512  005046                    CLR     -(SP)           ;;
1504  005514  013746  000034            MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1505  005520  012737  005530  000034    MOV     #72$,34         ;;SETUP NEW TRAP VECTOT
1506  005526  104400                    TRAP                    ;;PUSH OLD PSW AN PCON STACK
1507  005530  016666  000002  000006  72$:   MOV     2(SP),6(SP)     ;;
1508  005536  012716  005544                    MOV     #73$,(SP)               ;;REPLACE OLD PC WITH NEW
1509  005542  000002                    RTI                     ;;RESTORE PSW
1510  005544  012637  000034          73$:   MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1511  005550  014637  001214                    MOV     -(SP),$TMP6
1512  005554  052737  000200  001214            BIS     #200,$TMP6
```

```
1513  005562  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1514  005566  012746  005574                  MOV     #74$,-(SP)      ;;PUT NEW PC ON  STACK
1515  005572  000002                          RTI                     ;; POP NEW PC AND PS
1516  005574                          74$:
1517  005574  012714  177660                  MOV     #-80.,  @CDC    ;SET UP COLUMN COUNT TO READ 80 COLUMNS
1518  005600  012715  043766                  MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
1519  005604  012713  000101                  MOV     #101,   @CDS    ;SET INTERRUPT ENABLE AND READ
1520  005610  105713                  1$:     TSTB    @CDS            ;WAIT FOR CONTROLLER READY
1521  005612  100376                          BPL     1$
1522                                           ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV 2(ADINT),PS"
1523  005614  016246  000002                  MOV     2(ADINT),-(SP)  ;;PUT NEW PS ON STACK
1524  005620  012746  005626                  MOV     #75$,-(SP)      ;;PUT NEW PC ON  STACK
1525  005624  000002                          RTI                     ;; POP NEW PC AND PS
1526  005626                          75$:
1527  005626  005013                          CLR     @CDS            ;DISABLE INTERRUPTS
1528  005630  012712  000232                  MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
1529  005634  005037  000232                  CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1530  005640  005737  001252                  TST     INTFLG          ;TEST FOR A PREVIOUS INTERRUPT
1531  005644  001441                          BEQ     TST14           ;BRANCH IF NONE
1532  005646  023727  001252  100005          CMP     INTFLG, #100005 ;CHECK PREVIOUS LEVEL
1533  005654  100435                          BMI     TST14           ;BRANCH IF LOWER
1534  005656  104022                          ERROR +22                       ;INTERRUPT ALREADY OCCURRED AT LVL 5 OR HIGHER
1535  005660  000433                          BR      TST14
1536  005662  105713                  TINT13: TSTB    @CDS            ;MAKE SURE CONTROLLER READY IS SET
1537  005664  100401                          BMI     1$              ;BRANCH IF SET
1538  005666  104023                          ERROR +23                       ;CONTROLLER READY WASN'T SET
1539  005670  005013                  1$:     CLR     @CDS            ;DISABLE FURTHER INTERRUPTS
1540  005672  012712  000232                  MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
1541  005676  005037  000232                  CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1542  005702  022626                          CMP     (SP)+,  (SP)+   ;RESTORE STACK POINTER
1543  005704  005737  001252                  TST     INTFLG          ;CHECK FOR PREVIOUS FLAG
1544  005710  100412                          BMI     SET5            ;BRANCH IF FLAG SET
1545  005712  012737  100005  001252          MOV     #100005,INTFLG  ;SET FLAG AND LEVEL
1546  005720  104400  031430                  TYPE,   MSG4            ;PRINT MESSAGE "THE INTERRUPT LEVEL WAS"
1547  005724  012746  000005                  MOV     #5,-(SP)
1548  005730  104402                          TYPOS
1549  005732     001                          .BYTE   1
1550  005733     000                          .BYTE   0
1551  005734  000405                          BR      TST14
1552  005736  023727  001252  100005  SET5: CMP     INTFLG, #100005 ;CHECK PREVIOUS LEVEL
1553  005744  100001                          BPL     TST14
1554  005746  104024                          ERROR +24                       ;INTERRUPT ALREADY OCCURRED AT A LOWER LEVEL
1555                                  ;*****************************************************************
1556                                  ;*TEST 14       TEST FOR AN INTERRUPT ON LEVEL 4
1557                                  ;*****************************************************************
1558  005750  000004                  TST14:  SCOPE
1559  005752  004737  025442                  JSR     PC,     INIT    ;INITIALIZE
1560  005756  012712  006340                  MOV     #TINT14,@ADINT  ;SETUP RETURN ADDRESS
1561                                           ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
1562  005762  005046                          CLR     -(SP)           ;;
1563  005764  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1564  005770  012737  006000  000034          MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
1565  005776  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
1566  006000  016666  000002  000006  64$:     MOV     2(SP),6(SP)     ;;
```

```
1567  006006  012716  006014                    MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
1568  006012  000002                            RTI                     ;;RESTORE PSW
1569  006014  012637  000034          65$:      MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1570  006020  012637  001214                    MOV     (SP)+,$TMP6
1571  006024  052737  000340  001214            BIS     #340,$TMP6
1572  006032  013746  001214                    MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1573  006036  012746  006044                    MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
1574  006042  000002                            RTI                     ;; POP NEW PC AND PS
1575  006044                            66$:
1576                                            ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
1577  006044  005046                            CLR     -(SP)           ;;
1578  006046  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1579  006052  012737  006062  000034            MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
1580  006060  104400                            TRAP                    ;;PUSH OLD PSW AN PCON STACK
1581  006062  016666  000002  000006  67$:      MOV     2(SP),6(SP)     ;;
1582  006070  012716  006076                    MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
1583  006074  000002                            RTI                     ;;RESTORE PSW
1584  006076  012637  000034          68$:      MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1585  006102  012662  000002                    MOV     (SP)+,2(ADINT)
1586                                            ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
1587  006106  005046                            CLR     -(SP)           ;;
1588  006110  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1589  006114  012737  006124  000034            MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
1590  006122  104400                            TRAP                    ;;PUSH OLD PSW AN PCON STACK
1591  006124  016666  000002  000006  69$:      MOV     2(SP),6(SP)     ;;
1592  006132  012716  006140                    MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
1593  006136  000002                            RTI                     ;;RESTORE PSW
1594  006140  012637  000034          70$:      MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1595  006144  012637  001214                    MOV     (SP)+,$TMP6
1596  006150  042737  000340  001214            BIC     #340,$TMP6
1597  006156  013746  001214                    MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1598  006162  012746  006170                    MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
1599  006166  000002                            RTI                     ;; POP NEW PC AND PS
1600  006170                            71$:
1601  006170  005046                            CLR     -(SP)           ;;
1602  006172  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1603  006176  012737  006206  000034            MOV     #72$,34         ;;SETUP NEW TRAP VECTOT
1604  006204  104400                            TRAP                    ;;PUSH OLD PSW AN PCON STACK
1605  006206  016666  000002  000006  72$:      MOV     2(SP),6(SP)     ;;
1606  006214  012716  006222                    MOV     #73$,(SP)               ;;REPLACE OLD PC WITH NEW
1607  006220  000002                            RTI                     ;;RESTORE PSW
1608  006222  012637  000034          73$:      MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1609  006226  014637  001214                    MOV     -(SP),$TMP6
1610  006232  052737  000140  001214            BIS     #140,$TMP6
1611  006240  013746  001214                    MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1612  006244  012746  006252                    MOV     #74$,-(SP)      ;;PUT NEW PC ON  STACK
1613  006250  000002                            RTI                     ;; POP NEW PC AND PS
1614  006252                            74$:
1615  006252  012714  177660                    MOV     #-80.,  @CDC    ;SET UP COLUMN COUNT TO READ 80 COLUMNS
1616  006256  012715  043766                    MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
1617  006262  012713  000101                    MOV     #101,   @CDS    ;SET INTERRUPT ENABLE AND READ
1618  006266  105713                    1$:     TSTB    @CDS            ;WAIT FOR CONTROLLER READY
1619  006270  100376                            BPL     1$
1620                                            ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV 2(ADINT),PS"
```

```
1621  006272  016246  000002                  MOV     2(ADINT),-(SP)  ;;PUT NEW PS ON STACK
1622  006276  012746  006304                  MOV     #75$,-(SP)      ;;PUT NEW PC ON  STACK
1623  006302  000002                          RTI                     ;; POP NEW PC AND PS
1624  006304                          75$:
1625  006304  005013                          CLR     @CDS            ;DISABLE INTERRUPTS
1626  006306  012712  000232                  MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
1627  006312  005037  000232                  CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1628  006316  005737  001252                  TST     INTFLG          ;TEST FOR A PREVIOUS INTERRUPT
1629  006322  001433                          BEQ     TST15           ;BRANCH IF NONE
1630  006324  023727  001252  100004          CMP     INTFLG, #100004 ;CHECK PREVIOUS LEVEL
1631  006332  100427                          BMI     TST15           ;BRANCH IF LOWER
1632  006334  104022                          ERROR +22                       ;INTERRUPT ALREADY OCCURRED AT LVL 4 OR HIGHER
1633  006336  000425                          BR      TST15
1634  006340  105713                  TINT14: TSTB    @CDS            ;MAKE SURE CONTROLLER READY IS SET
1635  006342  100401                          BMI     1$              ;BRANCH IF SET
1636  006344  104023                          ERROR +23                       ;CONTROLLER READY WASN'T SET
1637  006346  005013                  1$:     CLR     @CDS            ;DISABLE FURTHER INTERRUPTS
1638  006350  012712  000232                  MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
1639  006354  005037  000232                  CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1640  006360  022626                          CMP     (SP)+,  (SP)+   ;RESTORE STACK POINTER
1641  006362  005737  001252                  TST     INTFLG          ;CHECK FOR PREVIOUS FLAG
1642  006366  100404                          BMI     SET4            ;BRANCH IF FLAG SET
1643  006370  012737  100004  001252          MOV     #100004,INTFLG ;SET FLAG AND LEVEL
1644  006376  000405                          BR      TST15
1645  006400  023727  001252  100004  SET4: CMP     INTFLG, #100004 ;CHECK PREVIOUS LEVEL
1646  006406  100001                          BPL     TST15
1647  006410  104024                          ERROR +24                       ;INTERRUPT ALREADY OCCURRED AT A LOWER LEVEL
1648                                  ;*****************************************************************
1649                                  ;*TEST 15       TEST FOR AN INTERRUPT ON LEVEL 3
1650                                  ;*****************************************************************
1651  006412  000004                  TST15:  SCOPE
1652  006414  004737  025442                  JSR     PC,     INIT    ;INITIALIZE
1653  006420  012712  007002                  MOV     #TINT15,@ADINT  ;SETUP RETURN ADDRESS
1654                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
1655  006424  005046                          CLR     -(SP)           ;;
1656  006426  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1657  006432  012737  006442  000034          MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
1658  006440  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
1659  006442  016666  000002  000006  64$:     MOV     2(SP),6(SP)     ;;
1660  006450  012716  006456                  MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
1661  006454  000002                          RTI                     ;;RESTORE PSW
1662  006456  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1663  006462  012637  001214                  MOV     (SP)+,$TMP6
1664  006466  052737  000340  001214          BIS     #340,$TMP6
1665  006474  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1666  006500  012746  006506                  MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
1667  006504  000002                          RTI                     ;; POP NEW PC AND PS
1668  006506                          66$:
1669                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
1670  006506  005046                          CLR     -(SP)           ;;
1671  006510  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1672  006514  012737  006524  000034          MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
1673  006522  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
1674  006524  016666  000002  000006  67$:     MOV     2(SP),6(SP)     ;;
```

```
1675  006532  012716  006540                 MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
1676  006536  000002                         RTI                     ;;RESTORE PSW
1677  006540  012637  000034         68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1678  006544  012662  000002                 MOV     (SP)+,2(ADINT)
1679                                         ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
1680  006550  005046                         CLR     -(SP)           ;;
1681  006552  013746  000034                 MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1682  006556  012737  006566  000034         MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
1683  006564  104400                         TRAP                    ;;PUSH OLD PSW AN PCON STACK
1684  006566  016666  000002  000006 69$:    MOV     2(SP),6(SP)     ;;
1685  006574  012716  006602                 MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
1686  006600  000002                         RTI                     ;;RESTORE PSW
1687  006602  012637  000034         70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOP
1688  006606  012637  001214                 MOV     (SP)+,$TMP6
1689  006612  042737  000340  001214         BIC     #340,$TMP6
1690  006620  013746  001214                 MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1691  006624  012746  006632                 MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
1692  006630  000002                         RTI                     ;; POP NEW PC AND PS
1693  006632                         71$:
1694  006632  005046                         CLR     -(SP)           ;;
1695  006634  013746  000034                 MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1696  006640  012737  006650  000034         MOV     #72$,34         ;;SETUP NEW TRAP VECTOT
1697  006646  104400                         TRAP                    ;;PUSH OLD PSW AN PCON STACK
1698  006650  016666  000002  000006 72$:    MOV     2(SP),6(SP)     ;;
1699  006656  012716  006664                 MOV     #73$,(SP)               ;;REPLACE OLD PC WITH NEW
1700  006662  000002                         RTI                     ;;RESTORE PSW
1701  006664  012637  000034         73$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1702  006670  014637  001214                 MOV     -(SP),$TMP6
1703  006674  052737  000100  001214         BIS     #100,$TMP6
1704  006702  013746  001214                 MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1705  006706  012746  006714                 MOV     #74$,-(SP)      ;;PUT NEW PC ON  STACK
1706  006712  000002                         RTI                     ;; POP NEW PC AND PS
1707  006714                         74$:
1708  006714  012714  177660                 MOV     #-80.,  @CDC    ;SET UP COLUMN COUNT TO READ 80 COLUMNS
1709  006720  012715  043766                 MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
1710  006724  012713  000101                 MOV     #101,   @CDS    ;SET INTERRUPT ENABLE AND READ
1711  006730  105713                 1$:     TSTB    @CDS            ;WAIT FOR CONTROLLER READY
1712  006732  100376                         BPL     1$
1713                                         ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV 2(ADINT),PS"
1714  006734  016246  000002                 MOV     2(ADINT),-(SP)  ;;PUT NEW PS ON STACK
1715  006740  012746  006746                 MOV     #75$,-(SP)      ;;PUT NEW PC ON  STACK
1716  006744  000002                         RTI                     ;; POP NEW PC AND PS
1717  006746                         75$:
1718  006746  005013                         CLR     @CDS            ;DISABLE INTERRUPTS
1719  006750  012712  000232                 MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
1720  006754  005037  000232                 CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1721  006760  005737  001252                 TST     INTFLG          ;TEST FOR A PREVIOUS INTERRUPT
1722  006764  001441                         BEQ     TST16           ;BRANCH IF NONE
1723  006766  023727  001252  100003         CMP     INTFLG, #100003 ;CHECK PREVIOUS LEVEL
1724  006774  100435                         BMI     TST16           ;BRANCH IF LOWER
1725  006776  104022                         ERROR +22                       ;INTERRUPT ALREADY OCCURRED AT LVL 3 OR HIGHER
1726  007000  000433                         BR      TST16
1727  007002  105713                 TINT15: TSTB    @CDS            ;MAKE SURE CONTROLLER READY IS SET
1728  007004  100401                         BMI     1$              ;BRANCH IF SET
```

```
1729  007006  104023                          ERROR +23                       ;CONTROLLER READY WASN'T SET
1730  007010  005013                  1$:     CLR     @CDS                    ;DISABLE FURTHER INTERRUPTS
1731  007012  012712  000232                  MOV     #232,   @ADINT          ;CHANGE INTERRUPT RETURN ADDRESS
1732  007016  005037  000232                  CLR     @#232                   ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1733  007022  022626                          CMP     (SP)+,  (SP)+           ;RESTORE STACK POINTER
1734  007024  005737  001252                  TST     INTFLG                  ;CHECK FOR PREVIOUS FLAG
1735  007030  100412                          BMI     SET3                    ;BRANCH IF FLAG SET
1736  007032  012737  100003  001252          MOV     #100003,INTFLG ;SET FLAG AND LEVEL
1737  007040  104400  031430                  TYPE,   MSG4                    ;PRINT MESSAGE "THE INTERRUPT LEVEL WAS"
1738  007044  012746  000003                  MOV     #3,-(SP)
1739  007050  104402                          TYPOS
1740  007052     001                          .BYTE   1
1741  007053     000                          .BYTE   0
1742  007054  000405                          BR      TST16
1743  007056  023727  001252  100003  SET3: CMP     INTFLG, #100003 ;CHECK PREVIOUS LEVEL
1744  007064  100001                          BPL     TST16
1745  007066  104024                          ERROR +24                       ;INTERRUPT ALREADY OCCURRED AT A LOWER LEVEL
1746                                  ;*****************************************************************
1747                                  ;*TEST 16       TEST FOR AN INTERRUPT ON LEVEL 2
1748                                  ;*****************************************************************
1749  007070  000004                  TST16:  SCOPE
1750  007072  004737  025442                  JSR     PC,     INIT    ;INITIALIZE
1751  007076  012712  007460                  MOV     #TINT16,@ADINT  ;SETUP RETURN ADDRESS
1752                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
1753  007102  005046                          CLR     -(SP)           ;;
1754  007104  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1755  007110  012737  007120  000034          MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
1756  007116  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
1757  007120  016666  000002  000006  64$:    MOV     2(SP),6(SP)     ;;
1758  007126  012716  007134                  MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
1759  007132  000002                          RTI                     ;;RESTORE PSW
1760  007134  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1761  007140  012637  001214                  MOV     (SP)+,$TMP6
1762  007144  052737  000340  001214          BIS     #340,$TMP6
1763  007152  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1764  007156  012746  007164                  MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
1765  007162  000002                          RTI                     ;; POP NEW PC AND PS
1766  007164                          66$:
1767                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
1768  007164  005046                          CLR     -(SP)           ;;
1769  007166  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1770  007172  012737  007202  000034          MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
1771  007200  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
1772  007202  016666  000002  000006  67$:    MOV     2(SP),6(SP)     ;;
1773  007210  012716  007216                  MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
1774  007214  000002                          RTI                     ;;RESTORE PSW
1775  007216  012637  000034          68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1776  007222  012662  000002                  MOV     (SP)+,2(ADINT)
1777                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
1778  007226  005046                          CLR     -(SP)           ;;
1779  007230  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1780  007234  012737  007244  000034          MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
1781  007242  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
1782  007244  016666  000002  000006  69$:    MOV     2(SP),6(SP)     ;;
```

```
1783  007252  012716  007260            MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
1784  007256  000002                    RTI                             ;;RESTORE PSW
1785  007260  012637  000034    70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1786  007264  012637  001214            MOV     (SP)+,$TMP6
1787  007270  042737  000340  001214    BIC     #340,$TMP6
1788  007276  013746  001214            MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1789  007302  012746  007310            MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
1790  007306  000002                    RTI                     ;; POP NEW PC AND PS
1791  007310                    71$:
1792  007310  005046                    CLR     -(SP)           ;;
1793  007312  013746  000034            MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1794  007316  012737  007326  000034    MOV     #72$,34         ;;SETUP NEW TRAP VECTOT
1795  007324  104400                    TRAP                    ;;PUSH OLD PSW AN PCON STACK
1796  007326  016666  000002  000006  72$:    MOV     2(SP),6(SP)     ;;
1797  007334  012716  007342            MOV     #73$,(SP)               ;;REPLACE OLD PC WITH NEW
1798  007340  000002                    RTI                             ;;RESTORE PSW
1799  007342  012637  000034    73$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1800  007346  014637  001214            MOV     -(SP),$TMP6
1801  007352  052737  000040  001214    BIS     #040,$TMP6
1802  007360  013746  001214            MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1803  007364  012746  007372            MOV     #74$,-(SP)      ;;PUT NEW PC ON  STACK
1804  007370  000002                    RTI                     ;; POP NEW PC AND PS
1805  007372                    74$:
1806  007372  012714  177660            MOV     #-80.,  @CDC    ;SET UP COLUMN COUNT TO READ 80 COLUMNS
1807  007376  012715  043766            MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
1808  007402  012713  000101            MOV     #101,   @CDS    ;SET INTERRUPT ENABLE AND READ
1809  007406  105713            1$:     TSTB    @CDS            ;WAIT FOR CONTROLLER READY
1810  007410  100376                    BPL     1$
1811                                    ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV 2(ADINT),PS"
1812  007412  016246  000002            MOV     2(ADINT),-(SP)  ;;PUT NEW PS ON STACK
1813  007416  012746  007424            MOV     #75$,-(SP)      ;;PUT NEW PC ON  STACK
1814  007422  000002                    RTI                     ;; POP NEW PC AND PS
1815  007424                    75$:
1816  007424  005013                    CLR     @CDS            ;DISABLE INTERRUPTS
1817  007426  012712  000232            MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
1818  007432  005037  000232            CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1819  007436  005737  001252            TST     INTFLG          ;TEST FOR A PREVIOUS INTERRUPT
1820  007442  001441                    BEQ     TST17           ;BRANCH IF NONE
1821  007444  023727  001252  100002    CMP     INTFLG, #100002 ;CHECK PREVIOUS LEVEL
1822  007452  100435                    BMI     TST17           ;BRANCH IF LOWER
1823  007454  104022                    ERROR +22                       ;INTERRUPT ALREADY OCCURRED AT LVL 2 OR HIGHER
1824  007456  000433                    BR      TST17
1825  007460  105713            TINT16: TSTB    @CDS            ;MAKE SURE CONTROLLER READY IS SET
1826  007462  100401                    BMI     1$              ;BRANCH IF SET
1827  007464  104023                    ERROR +23                       ;CONTROLLER READY WASN'T SET
1828  007466  005013            1$:     CLR     @CDS            ;DISABLE FURTHER INTERRUPTS
1829  007470  012712  000232            MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
1830  007474  005037  000232            CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1831  007500  022626                    CMP     (SP)+,  (SP)+   ;RESTORE STACK POINTER
1832  007502  005737  001252            TST     INTFLG          ;CHECK FOR PREVIOUS FLAG
1833  007506  100412                    BMI     SET2            ;BRANCH IF FLAG SET
1834  007510  012737  100002  001252    MOV     #100002,INTFLG  ;SET FLAG AND LEVEL
1835  007516  104400  031430            TYPE,   MSG4            ;PRINT MESSAGE "THE INTERRUPT LEVEL WAS"
1836  007522  012746  000002            MOV     #2,-(SP)
```

```
1837  007526  104402                          TYPOS
1838  007530  001                             .BYTE   1
1839  007531  000                             .BYTE   0
1840  007532  000405                          BR      TST17
1841  007534  023727  001252  100002  SET2: CMP     INTFLG, #100002 ;CHECK PREVIOUS LEVEL
1842  007542  100001                          BPL     TST17
1843  007544  104024                          ERROR +24                       ;INTERRUPT ALREADY OCCURRED AT A LOWER LEVEL
1844                                  ;*****************************************************************
1845                                  ;*TEST 17       TEST FOR AN INTERRUPT ON LEVEL 1
1846                                  ;*****************************************************************
1847  007546  000004                  TST17:  SCOPE
1848  007550  004737  025442                  JSR     PC,     INIT    ;INITIALIZE
1849  007554  012712  010120                  MOV     #TINT17,@ADINT  ;SETUP RETURN ADDRESS
1850                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
1851  007560  005046                          CLR     -(SP)           ;;
1852  007562  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1853  007566  012737  007576  000034          MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
1854  007574  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
1855  007576  016666  000002  000006  64$:    MOV     2(SP),6(SP)     ;;
1856  007604  012716  007612                  MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
1857  007610  000002                          RTI                     ;;RESTORE PSW
1858  007612  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1859  007616  012637  001214                  MOV     (SP)+,$TMP6
1860  007622  052737  000340  001214          BIS     #340,$TMP6
1861  007630  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1862  007634  012746  007642                  MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
1863  007640  000002                          RTI                     ;; POP NEW PC AND PS
1864  007642                          66$:
1865                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
1866  007642  005046                  CLR     -(SP)           ;;
1867  007644  013746  000034          MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1868  007650  012737  007660  000034  MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
1869  007656  104400                  TRAP                    ;;PUSH OLD PSW AN PCON STACK
1870  007660  016666  000002  000006  67$:    MOV     2(SP),6(SP)     ;;
1871  007666  012716  007674                  MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
1872  007672  000002                          RTI                     ;;RESTORE PSW
1873  007674  012637  000034          68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1874  007700  012662  000002                  MOV     (SP)+,2(ADINT)
1875                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
1876  007704  005046                  CLR     -(SP)           ;;
1877  007706  013746  000034          MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1878  007712  012737  007722  000034  MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
1879  007720  104400                  TRAP                    ;;PUSH OLD PSW AN PCON STACK
1880  007722  016666  000002  000006  69$:    MOV     2(SP),6(SP)     ;;
1881  007730  012716  007736                  MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
1882  007734  000002                          RTI                     ;;RESTORE PSW
1883  007736  012637  000034          70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1884  007742  012637  001214                  MOV     (SP)+,$TMP6
1885  007746  042737  000340  001214          BIC     #340,$TMP6
1886  007754  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1887  007760  012746  007766                  MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
1888  007764  000002                          RTI                     ;; POP NEW PC AND PS
1889  007766                          71$:
1890  007766  005046                  CLR     -(SP)           ;;
```

```
 1891  007770  013746  000034                        MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
 1892  007774  012737  010004  000034                MOV     #72$,34         ;;SETUP NEW TRAP VECTOT
 1893  010002  104400                                TRAP                    ;;PUSH OLD PSW AN PCON STACK
 1894  010004  016666  000002  000006  72$:   MOV     2(SP),6(SP)     ;;
 1895  010012  012716  010020                        MOV     #73$,(SP)               ;;REPLACE OLD PC WITH NEW
 1896  010016  000002                                RTI                     ;;RESTORE PSW
 1897  010020  012637  000034          73$:   MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
 1898  010024  014637  001214                        MOV     -(SP),$TMP6
 1899  010030  052737  000000  001214                BIS     #000,$TMP6
 1900  010036  013746  001214                        MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
 1901  010042  012746  010050                        MOV     #74$,-(SP)      ;;PUT NEW PC ON  STACK
 1902  010046  000002                                RTI                     ;; POP NEW PC AND PS
 1903  010050                          74$:
 1904  010050  012714  177660                        MOV     #-80.,  @CDC    ;SET UP COLUMN COUNT TO READ 80 COLUMNS
 1905  010054  012715  043766                        MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
 1906  010060  012713  000101                        MOV     #101,   @CDS    ;SET INTERRUPT ENABLE AND READ
 1907  010064  105713                  1$:    TSTB    @CDS            ;WAIT FOR CONTROLLER READY
 1908  010066  100376                          BPL     1$
 1909                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV 2(ADINT),PS"
 1910  010070  016246  000002                        MOV     2(ADINT),-(SP)  ;;PUT NEW PS ON STACK
 1911  010074  012746  010102                        MOV     #75$,-(SP)      ;;PUT NEW PC ON  STACK
 1912  010100  000002                                RTI                     ;; POP NEW PC AND PS
 1913  010102                          75$:
 1914  010102  005013                          CLR     @CDS            ;DISABLE INTERRUPTS
 1915  010104  012712  000232                        MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
 1916  010110  005037  000232                        CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
 1917  010114  104041                          ERROR +41                       ;NO INTERRUPT WITH PROCESSOR AT LEVEL 0
 1918  010116  000433                          BR      TST20
 1919  010120  105713                  TINT17: TSTB    @CDS            ;MAKE SURE CONTROLLER READY IS SET
 1920  010122  100401                          BMI     1$              ;BRANCH IF SET
 1921  010124  104023                          ERROR +23                       ;CONTROLLER READY WASN'T SET
 1922  010126  005013                  1$:    CLR     @CDS            ;DISABLE FURTHER INTERRUPTS
 1923  010130  012712  000232                        MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
 1924  010134  005037  000232                        CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
 1925  010140  022626                          CMP     (SP)+,  (SP)+   ;RESTORE STACK POINTER
 1926  010142  005737  001252                        TST     INTFLG          ;CHECK FOR PREVIOUS FLAG
 1927  010146  100412                          BMI     SET1            ;BRANCH IF FLAG SET
 1928  010150  012737  100001  001252                MOV     #100001,INTFLG ;SET FLAG AND LEVEL
 1929  010156  104400  031430                        TYPE,   MSG4            ;PRINT MESSAGE "THE INTERRUPT LEVEL WAS"
 1930  010162  012746  000001                        MOV     #1,-(SP)
 1931  010166  104402                          TYPOS
 1932  010170     001                          .BYTE   1
 1933  010171     000                          .BYTE   0
 1934  010172  000405                          BR      TST20
 1935  010174  023727  001252  100001  SET1: CMP     INTFLG, #100001 ;CHECK PREVIOUS LEVEL
 1936  010202  100001                          BPL     TST20
 1937  010204  104024                          ERROR +24                       ;INTERRUPT ALREADY OCCURRED AT A LOWER LEVEL
 1938
 1939                                  ;*****************************************************************
 1940                                  ;*TEST 20       TEST NO INTERRUPT WITH IE SET & REST CLEARED
 1941                                  ;*****************************************************************
 1942  010206  000004                  TST20:  SCOPE
 1943  010210  004737  025442                        JSR     PC,     INIT    ;INITIALIZE CSR TO ZERO
 1944  010214  012712  010422                        MOV     #TINT20,@ADINT  ;SETUP RETURN ADDRESS
```

```
1945                                                    ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
1946  01__0  005046                                    CLR     -(SP)           ;;
1947  010222  013746  000034                          MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1948  010226  012737  010236  000034                  MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
1949  010234  104400                                  TRAP                    ;;PUSH OLD PSW AN PCON STACK
1950  010236  016666  000002  000006  64$:           MOV     2(SP),6(SP)     ;;
1951  010244  012716  010252                          MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
1952  010250  000002                                  RTI                     ;;RESTORE PSW
1953  010252  012637  000034          65$:           MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1954  010256  012637  001214                          MOV     (SP)+,$TMP6
1955  010262  052737  000340  001214                  BIS     #340,$TMP6
1956  010270  013746  001214                          MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1957  010274  012746  010302                          MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
1958  010300  000002                                  RTI                     ;; POP NEW PC AND PS
1959  010302                                  66$:
1960                                                    ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
1961  010302  005046                                    CLR     -(SP)           ;;
1962  010304  013746  000034                          MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1963  010310  012737  010320  000034                  MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
1964  010316  104400                                  TRAP                    ;;PUSH OLD PSW AN PCON STACK
1965  010320  016666  000002  000006  67$:           MOV     2(SP),6(SP)     ;;
1966  010326  012716  010334                          MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
1967  010332  000002                                  RTI                     ;;RESTORE PSW
1968  010334  012637  000034          68$:           MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1969  010340  012662  000002                          MOV     (SP)+,2(ADINT)
1970  010344  013746  000000                          MOV     PRO,-(SP)       ;;PUT NEW PS ON STACK
1971  010350  012746  010356                          MOV     #69$,-(SP)      ;;PUT NEW PC ON  STACK
1972  010354  000002                                  RTI                     ;; POP NEW PC AND PS
1973  010356                                  69$:
1974  010356  012714  177777                          MOV     #-1,    @CDC    ;SET UP COLUMN COUNT TO READ 1 COLUMN
1975  010362  012715  043766                          MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
1976  010366  012713  000100                          MOV     #100,   @CDS    ;ENABLE INTERRUPTS
1977  010372  005037  001250                          CLR     COUNT           ;INITIALIZE COUNTER
1978  010376  005237  001250          1$:            INC     COUNT           ;WAIT AWHILE
1979  010402  001375                                  BNE     1$
1980                                                    ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV 2(ADINT),PS"
1981  010404  016246  000002                          MOV     2(ADINT),-(SP)  ;;PUT NEW PS ON STACK
1982  010410  012746  010416                          MOV     #70$,-(SP)      ;;PUT NEW PC ON  STACK
1983  010414  000002                                  RTI                     ;; POP NEW PC AND PS
1984  010416                                  70$:
1985  010416  005013                                  CLR     @CDS            ;DISABLE FURTHER INTERRUPTS
1986  010420  000403                                  BR      CONT20
1987  010422  104021                          TINT20: ERROR +21                       ;AN INTERRUPT OCCURRED
1988  010424  022626                                  CMP     (SP)+,  (SP)+   ;RESTORE STACK
1989  010426  005013                                  CLR     @CDS            ;DISABLE FURTHER INTERRUPTS
1990  010430  005037  000232          CONT20: CLR     @#232           ;CHANGE INTERRUPT RETURN ADDRESS TO
1991  010434  012712  000232                  MOV     #232,   @ADINT  ;CAUSE A HALT IF AN INTERRUPT OCCURS
1992
1993                                            ;*****************************************************************
1994                                            ;*TEST 21       SIMULTANEOUS INTERRUPTS AT MORE THAN 1 LEVEL
1995                                            ;*****************************************************************
1996  010440  000004                          TST21:  SCOPE
1997  010442  004737  025442                  JSR     PC,     INIT    ;INITIALIZE CSR TO ZERO
1998  010446  012712  010676                  MOV     #TINT21,@ADINT  ;SETUP RETURN ADDRESS
```

```
                                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
010452  005046                                  CLR     -(SP)           ;;
010454  013746  000034                          MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
010460  012737  010470  000034                  MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
010466  104400                                  TRAP                    ;;PUSH OLD PSW AN PCON STACK
010470  016666  000002  000006  64$:            MOV     2(SP),6(SP)     ;;
010476  012716  010504                          MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
010502  000002                                  RTI                     ;;RESTORE PSW
010504  012637  000034          65$:            MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
010510  012637  001214                          MOV     (SP)+,$TMP6
010514  052737  000340  001214                  BIS     #340,$TMP6
010520  013746  001214                          MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
010526  012746  010534                          MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
010532  000002                                  RTI                     ;; POP NEW PC AND PS
010534                          66$:
                                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
010534  005046                                  CLR     -(SP)           ;;
010536  013746  000034                          MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
010542  012737  010552  000034                  MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
010550  104400                                  TRAP                    ;;PUSH OLD PSW AN PCON STACK
010552  016666  000002  000006  67$:            MOV     2(SP),6(SP)     ;;
010560  012716  010566                          MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
010564  000002                                  RTI                     ;;RESTORE PSW
010566  012637  000034          68$:            MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
010572  012662  000002                          MOV     (SP)+,2(ADINT)
                                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
010576  005046                                  CLR     -(SP)           ;;
010600  013746  000034                          MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
010604  012737  010614  000034                  MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
010612  104400                                  TRAP                    ;;PUSH OLD PSW AN PCON STACK
010614  016666  000002  000006  69$:            MOV     2(SP),6(SP)     ;;
010622  012716  010630                          MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
010626  000002                                  RTI                     ;;RESTORE PSW
010630  012637  000034          70$:            MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
010634  012637  001214                          MOV     (SP)+,$TMP6
010640  042737  000340  001214                  BIC     #340,$TMP6
010646  013746  001214                          MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
010652  012746  010660                          MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
010656  000002                                  RTI                     ;; POP NEW PC AND PS
010660                          71$:
010660  012714  177777                          MOV     #-1,    @CDC    ;SET UP COLUMN COUNT TO READ 1 COLUMN
010664  012715  043766                          MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
010670  012713  000101                          MOV     #101,   @CDS    ;SET INTERRUPT ENABLE AND READ
010674  000777                                  BR      .               ;WAIT FOR INTERRUPT
010676  022626          TINT21: CMP     (SP)+,  (SP)+   ;RESTORE STACK POINTER
010700  012712  010734                          MOV     #TINA21,@ADINT  ;CHANGE RETRUN ADDRESS
010704  013746  000000                          MOV     PR0,-(SP)       ;;PUT NEW PS ON STACK
010710  012746  010716                          MOV     #64$,-(SP)      ;;PUT NEW PC ON  STACK
010714  000002                                  RTI                     ;; POP NEW PC AND PS
010716                          64$:
010716  000240                                  NOP                     ;WAIT
                                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV 2(ADINT),PS"
010720  016246  000002                          MOV     2(ADINT),-(SP)  ;;PUT NEW PS ON STACK
010724  012746  010732                          MOV     #65$,-(SP)      ;;PUT NEW PC ON  STACK
```

```
2053  010730  000002                          RTI                     ;; POP NEW PC AND PS
2054  010732                          65$:
2055  010732  000402                          BR      CONT21
2056  010734  022626                  TINA21: CMP     (SP)+,  (SP)+   ;RESTORE STACK
2057  010736  104025                          ERROR +25                       ;THE INTERRUPT OCCURRED AT 2 LEVELS
2058  010740  005013                  CONT21: CLR     @CDS            ;DISABLE INTERRUPTS
2059  010742  005037  000232                  CLR     @#232           ;CHANGE INTERRUPT RETURN ADDRESS TO
2060  010746  012712  000232                  MOV     #232,   @ADINT  ;CAUSE A HALT IF AN INTERRUPT OCCURS
2061
2062                                  ;*****************************************************************
2063                                  ;*TEST 22       NON-EXISTANT MEMORY DETECTION
2064                                  ;*****************************************************************
2065  010752  000004                  TST22:  SCOPE
2066  010754  004737  025442                  JSR     PC,     INIT    ;INITIALIZE CSR TO ZERO
2067  010760  012712  011210                  MOV     #TINT22,@ADINT  ;SETUP RETURN ADDRESS
2068                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
2069  010764  005046                          CLR     -(SP)           ;;
2070  010766  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
2071  010772  012737  011002  000034          MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
2072  011000  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
2073  011002  016666  000002  000006  64$:    MOV     2(SP),6(SP)     ;;
2074  011010  012716  011016                  MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
2075  011014  000002                          RTI                     ;;RESTORE PSW
2076  011016  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
2077  011022  012637  001214                  MOV     (SP)+,$TMP6
2078  011026  052737  000340  001214          BIS     #340,$TMP6
2079  011034  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
2080  011040  012746  011046                  MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
2081  011044  000002                          RTI                     ;; POP NEW PC AND PS
2082  011046                          66$:
2083                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
2084  011046  005046                  CLR     -(SP)           ;;
2085  011050  013746  000034          MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
2086  011054  012737  011064  000034  MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
2087  011062  104400                  TRAP                    ;;PUSH OLD PSW AN PCON STACK
2088  011064  016666  000002  000006  67$:    MOV     2(SP),6(SP)     ;;
2089  011072  012716  011100                  MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
2090  011076  000002                          RTI                     ;;RESTORE PSW
2091  011100  012637  000034          68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
2092  011104  012662  000002                  MOV     (SP)+,2(ADINT)
2093                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
2094  011110  005046                  CLR     -(SP)           ;;
2095  011112  013746  000034          MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
2096  011116  012737  011126  000034  MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
2097  011124  104400                  TRAP                    ;;PUSH OLD PSW AN PCON STACK
2098  011126  016666  000002  000006  69$:    MOV     2(SP),6(SP)     ;;
2099  011134  012716  011142                  MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
2100  011140  000002                          RTI                     ;;RESTORE PSW
2101  011142  012637  000034          70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
2102  011146  012637  001214                  MOV     (SP)+,$TMP6
2103  011152  042737  000340  001214          BIC     #340,$TMP6
2104  011160  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
2105  011164  012746  011172                  MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
2106  011170  000002                          RTI                     ;; POP NEW PC AND PS
```

```
2107  011172                          71$:
2108  011172  012714  177773                MOV     #-5,    @CDC    ;SET UP COLUMN COUNT TO READ 1 COLUMN
2109  011176  012715  160000                MOV     #160000,@CDA    ;SET UP BUS ADDRESS TO NON-EXISTANT MEMORY
2110  011202  012713  000161                MOV     #161,   @CDS    ;SET INTERRUPT ENABLE AND READ, X MEM BITS SET
2111  011206  000777                        BR      .               ;WAIT FOR INTERRUPT
2112  011210  022626                TINT22: CMP     (SP)+,  (SP)+   ;RESTORE STACK
2113  011212  005037  000232                CLR     @#232           ;CHANGE INTERRUPT RETURN ADDRESS TO
2114  011216  012712  000232                MOV     #232,   @ADINT  ;CAUSE A HALT IF AN INTERRUPT OCCURS
2115  011222  105713                        TSTB    @CDS            ;CHECK FOR CONTROLLER READY
2116  011224  100401                        BMI     1$              ;BRANCH IF SET OK
2117  011226  104023                        ERROR +23                       ;CONTROLLER READY DIDN'T SET
2118
2119  011230  005713                1$:     TST     @CDS            ;CHECK FOR ERROR (BIT 15)
2120  011232  100401                        BMI     2$              ;BRANCH IF SET OK
2121  011234  104026                        ERROR +26                       ;ERROR BIT 15 NOT SET
2122
2123  011236  032713  001000        2$:     BIT     #1000,  @CDS    ;CHECK FOR NON-EXISTANT MEMORY (BIT 9)
2124  011242  001001                        BNE     3$              ;BRANCH IF SET OK
2125  011244  104027                        ERROR +27                       ;BIT 9 NOT SET
2126
2127  011246  032713  000040        3$:     BIT     #40,    @CDS    ;CHECK FOR EXTENDED MEMORY BIT 17 SET
2128  011252  001001                        BNE     4$              ;BRANCH IF SET OK
2129  011254  104030                        ERROR +30                       ;EX-MEM BIT 17 GOT CLEARED
2130
2131  011256  032713  000020        4$:     BIT     #20,    @CDS    ;CHECK FOR EX-MEM (BIT 4)
2132  011262  001001                        BNE     5$              ;BRANCH IF SET OK
2133  011264  104031                        ERROR +31                       ;EX-MEM (BIT 4) GOT CLEARED
2134
2135  011266  032713  076417        5$:     BIT     #076417,@CDS   ;CHECK FOR ANY OTHER BITS
2136  011272  001401                        BEQ     6$              ;BRANCH IF OK
2137  011274  104032                        ERROR +32                       ;EXTRA ERROR BITS SET
2138
2139  011276  022715  160002        6$:     CMP     #160002,@CDA   ;CHECK ADDRESS BUFFER
2140  011302  001404                        BEQ     7$              ;BRANCH IF OK
2141  011304  012737  160002  001210        MOV     #160002,$TMP4  ;CORRECT 'CDA' CONTENTS FOR ERROR REPORT
2142  011312  104033                        ERROR +33                       ;BUS ADDRESS REG CHANGED
2143
2144  011314  022714  177774        7$:     CMP     #-4,    @CDC    ;CHECK COLUMN COUNT REG
2145  011320  001404                        BEQ     10$             ;BRANCH IF OK
2146  011322  012737  177774  001210        MOV     #-4,$TMP4       ;CORRECT 'CDC' CONTENTS FOR ERROR REPORT
2147  011330  104034                        ERROR +34                       ;COLUMN COUNT REG CHANGED
2148  011332                          10$:
2149
2150                                  ;*****************************************************************
2151                                  ;*TEST 23       EXECUTE DATI,DATOB(LOW BYTE) LOAD ON COLUMN COUNT
2152                                  ;*****************************************************************
2153  011332  000004                TST23:  SCOPE
2154  011334  005014                        CLR     @CDC                    ;CLEAR COLUMN COUNT REGISTER
2155                                                                        ;PRIOR TO BYTE LOADING
2156  011336  012700  125252                MOV     #125252,R0              ;SET VALUE FOR BYTE LOAD FROM R0
2157  011342  110014                        MOVB    R0,@CDC                 ;ATTEMPT TO LOAD LOWER BYTE
2158                                                                        ;OF COLUMN COUNT REGISTER
2159  011344  020014                        CMP     R0,@CDC                 ;DID HIGH BYTE GET LOADED AS
2160                                                                        ;WELL ON A LOW BYTE LOADING?
```

```
2161  011346  001403                        BEQ     1$                      ;BRANCH IF YES
2162  011350  010037  001210                MOV     R0,$TMP4                ;STORE GOOD DATA - SHOULD BE
2163  011354  104034                        ERROR +34                       ;HIGH BYTE NOT LOADED ON A LOW
2164                                                                          ;BYTE LOAD OF COLUMN COUNT REGISTER
2165  011356                          1$:
2166
2167                                  ;*********************************************************************
2168                                  ;*TEST 24       EXECUTE DATI,DATOB(HIGH BYTE) LOAD ON COLUMN COUNT
2169                                  ;*********************************************************************
2170  011356  000004                  TST24:  SCOPE
2171  011360  005014                        CLR     @CDC                    ;CLEAR COLUMN COUNT REGISTER
2172                                                                          ;PRIOR TO BYTE LOADING
2173  011362  012700  125252                MOV     #125252,R0              ;SET VALUE FOR BYTE LOAD FROM R0
2174  011366  110064  000001                MOVB    R0,+1(R4)               ;ATTEMPT TO LOAD HIGH BYTE
2175                                                                          ;OF COLUMN COUNT REGISTER
2176  011372  005714                        TST     @CDC                    ;DID LOW BYTE GET LOADED AS
2177                                                                          ;WELL ON HIGH BYTE LOADING?
2178  011374  001403                        BEQ     1$                      ;BRANCH IF NO
2179  011376  005037  001210                CLR     $TMP4                   ;STORE GOOD DATA - SHOULD BE
2180  011402  104034                        ERROR +34                       ;LOW BYTE LOADED ON A HIGH
2181                                                                          ;BYTE LOAD OF COLUMN COUNT REGISTER
2182  011404                          1$:
2183
2184                                  ;*********************************************************************
2185                                  ;*TEST 25       EXECUTE DATI,DATIP ON COLUMN COUNT REGISTER
2186                                  ;*********************************************************************
2187  011404  000004                  TST25:  SCOPE
2188  011406  005014                        CLR     @CDC                    ;CLEAR COLUMN COUNT REGISTER
2189                                                                          ;PRIOR TO 'DATIP' PROCESS
2190  011410  012714  100000                MOV     #100000,@CDC            ;SET A KNOWN VALUE INTO COLUMN
2191                                                                          ;COUNT REGISTER
2192  011414  005414                        NEG     @CDC                    ;PERFORM DATIP, ON COLUMN COUNT
2193                                                                          ;REGISTER
2194  011416  022714  100000                CMP     #100000,@CDC            ;IS CONTENTS = 100000?
2195  011422  001404                        BEQ     1$                      ;BRANCH IF YES
2196  011424  012737  100000  001210        MOV     #100000,$TMP4           ;STORE GOOD DATA - SHOULD BE
2197  011432  104034                        ERROR +34                       ;CONTENTS OF COLUMN COUNT REGISTER
2198                                                                          ;INCORRECT
2199  011434                          1$:
2200
2201                                  ;*********************************************************************
2202                                  ;*TEST 26       EXECUTE DATI,DATOB(LOW BYTE) LOAD ON BUS ADDRESS
2203                                  ;*********************************************************************
2204  011434  000004                  TST26:  SCOPE
2205  011436  005015                        CLR     @CDA                    ;CLEAR BUS ADDRESS REGISTER
2206                                                                          ;PRIOR TO BYTE LOADING
2207  011440  012700  125252                MOV     #125252,R0              ;SET VALUE FOR BYTE LOAD FROM R0
2208  011444  110015                        MOVB    R0,@CDA                 ;ATTEMPT TO LOAD LOWER BYTE
2209                                                                          ;OF BUS ADDRESS REGISTER
2210  011446  020015                        CMP     R0,@CDA                 ;DID HIGH BYTE GET LOADED AS
2211                                                                          ;WELL ON A LOW BYTE LOADING?
2212  011450  001403                        BEQ     1$                      ;BRANCH IF YES
2213  011452  010037  001210                MOV     R0,$TMP4                ;STORE GOOD DATA - SHOULD BE
2214  011456  104033                        ERROR +33                       ;HIGH BYTE NOT LOADED ON A LOW
```

```
                                                        ;BYTE LOAD OF BUS ADDRESS REGISTER
011460                                  1$:
                                        ;*****************************************************************
                                        ;*TEST 27       EXECUTE DATI,DATOB(HIGH BYTE) LOAD ON BUS ADDRESS
                                        ;*****************************************************************
011460  000004                          TST27:  SCOPE
011462  005015                                  CLR     @CDA            ;CLEAR BUS ADDRESS REGISTER
                                                                        ;PRIOR TO BYTE LOADING
011464  012700  125252                          MOV     #125252,R0      ;SET VALUE FOR BYTE LOAD FROM R0
011470  110065  000001                          MOVB    R0,+1(R5)       ;ATTEMPT TO LOAD HIGH BYTE
                                                                        ;OF BUS ADDRESS REGISTER
011474  005715                                  TST     @CDA            ;DID LOW BYTE GET LOADED AS
                                                                        ;WELL ON HIGH BYTE LOADING?
011476  001403                                  BEQ     1$              ;BRANCH IF NO
011500  005037  001210                          CLR     $TMP4           ;STORE GOOD DATA - SHOULD BE
011504  104033                                  ERROR +33               ;LOW BYTE LOADED ON A HIGH
                                                                        ;BYTE LOAD OF BUS ADDRESS REGISTER
011506                                  1$:
                                        ;*****************************************************************
                                        ;*TEST 30       EXECUTE DATI,DATIP ON BUS ADDRESS REGISTER
                                        ;*****************************************************************
011506  000004                          TST30:  SCOPE
011510  005015                                  CLR     @CDA            ;CLEAR BUS ADDRESS REGISTER
                                                                        ;PRIOR TO 'DATIP' PROCESS
011512  012715  100000                          MOV     #100000,@CDA    ;SET A KNOWN VALUE INTO BUS
                                                                        ;ADDRESS REGISTER
011516  005415                                  NEG     @CDA            ;PERFORM DATIP, ON BUS ADDRESS
                                                                        ;REGISTER
011520  022715  100000                          CMP     #100000,@CDA    ;IS CONTENTS = 100000?
011524  001404                                  BEQ     1$              ;BRANCH IF YES
011526  012737  100000  001210                  MOV     #100000,$TMP4   ;STORE GOOD DATA - SHOULD BE
011534  104033                                  ERROR +33               ;CONTENTS OF BUS ADDRESS REGISTER
                                                                        ;INCORRECT
011536                                  1$:
                                        ;*****************************************************************
                                        ;*TEST 31       WORD COUNT OVERFLOW TO 2ND CARD
                                        ;*****************************************************************
011536  000004                          TST31:  SCOPE
011540  004737  025442                          JSR     PC,INIT                 ;INITIALIZE
011544  012712  012112                          MOV     #TINT31,@ADINT          ;SET UP A RETURN ADDRESS
                                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
011550  005046                                  CLR     -(SP)           ;;
011552  013746  000034                          MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
011556  012737  011566  000034                  MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
011564  104400                                  TRAP                    ;;PUSH OLD PSW AN PCON STACK
011566  016666  000002  000006  64$:   MOV     2(SP),6(SP)     ;;
011574  012716  011602                          MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
011600  000002                                  RTI                     ;;RESTORE PSW
011602  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
011606  012637  001214                          MOV     (SP)+,$TMP6
011612  052737  000340  001214                  BIS     #340,$TMP6
```

```
2269  011620  013746  001214                    MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
2270  011624  012746  011632                    MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
2271  011630  000002                            RTI                     ;; POP NEW PC AND PS
2272  011632                            66$:
2273                                            ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
2274  011632  005046                            CLR     -(SP)           ;;
2275  011634  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
2276  011640  012737  011650  000034            MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
2277  011646  104400                            TRAP                    ;;PUSH OLD PSW AN PCON STACK
2278  011650  016666  000002  000006  67$:      MOV     2(SP),6(SP)     ;;
2279  011656  012716  011664                    MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
2280  011662  000002                            RTI                     ;;RESTORE PSW
2281  011664  012637  000034           68$:     MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
2282  011670  012662  000002                    MOV     (SP)+,2(ADINT)
2283                                            ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
2284  011674  005046                            CLR     -(SP)           ;;
2285  011676  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
2286  011702  012737  011712  000034            MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
2287  011710  104400                            TRAP                    ;;PUSH OLD PSW AN PCON STACK
2288  011712  016666  000002  000006  69$:      MOV     2(SP),6(SP)     ;;
2289  011720  012716  011726                    MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
2290  011724  000002                            RTI                     ;;RESTORE PSW
2291  011726  012637  000034           70$:     MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
2292  011732  012637  001214                    MOV     (SP)+,$TMP6
2293  011736  042737  000340  001214            BIC     #340,$TMP6
2294  011744  013746  001214                    MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
2295  011750  012746  011756                    MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
2296  011754  000002                            RTI                     ;; POP NEW PC AND PS
2297  011756                            71$:
2298  011756  005046                            CLR     -(SP)           ;;
2299  011760  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
2300  011764  012737  011774  000034            MOV     #72$,34         ;;SETUP NEW TRAP VECTOT
2301  011772  104400                            TRAP                    ;;PUSH OLD PSW AN PCON STACK
2302  011774  016666  000002  000006  72$:      MOV     2(SP),6(SP)     ;;
2303  012002  012716  012010                    MOV     #73$,(SP)               ;;REPLACE OLD PC WITH NEW
2304  012006  000002                            RTI                     ;;RESTORE PSW
2305  012010  012637  000034           73$:     MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
2306  012014  014637  001214                    MOV     -(SP),$TMP6
2307  012020  052737  000000  001214            BIS     #000,$TMP6
2308  012026  013746  001214                    MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
2309  012032  012746  012040                    MOV     #74$,-(SP)      ;;PUT NEW PC ON  STACK
2310  012036  000002                            RTI                     ;; POP NEW PC AND PS
2311  012040                            74$:
2312  012040  012714  177657                    MOV     #-81.,@CDC              ;SET COLUMN COUNT TO READ 81. COLUMNS
2313                                                                    ;I.E. - WRAP AROUND INTO 2ND CARD
2314                                                                    ;AUTOMATICALLY
2315  012044  012715  043766                    MOV     #BUFBEG,@CDA            ;SET UP STARTING BUFFER ADDRESS
2316                                                                    ;FOR DUMP OF CARD/S CONTENTS
2317  012050  012713  000101                    MOV     #101,@CDS               ;SET INTERRUPT ENABLE & READ
2318  012054  105713                    1$:     TSTB    @CDS                    ;WE COME HERE AWAITING THE INTERRUPT
2319  012056  100376                            BPL     1$                      ;AWAIT INTERRUPT
2320                                            ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV 2(ADINT),PS"
2321  012060  016246  000002                    MOV     2(ADINT),-(SP)  ;;PUT NEW PS ON STACK
2322  012064  012746  012072                    MOV     #75$,-(SP)      ;;PUT NEW PC ON  STACK
```

```
2323  012070  000002                          RTI                     ;; POP NEW PC AND PS
2324  012072                          75$:
2325                                                                  ;AND GIVE CONTROL BACK TO THE
2326                                                                  ;PROCESSOR
2327  012072  005013                          CLR     @CDS            ;DISABLE INTERRUPTS
2328  012074  012712  000232                 MOV     #232,@ADINT     ;RESTORE INTERRUPT RETURN ADDRESS
2329  012100  005037  000232                 CLR     @#232           ;TO 'HALT' IF AN UNEXPECTED INTERRUPT
2330                                                                  ;OCCURS
2331  012104  104041                          ERROR +41               ;NO INTERRUPT WITH PROCESSOR AT
2332                                                                  ;LEVEL 0
2333  012106  000137  012152                 JMP     T31END          ;GO TO NEXT TEST
2334  012112  105713                  TINT31: TSTB    @CDS            ;IS CONTROLLER READY SET?
2335  012114  100401                          BMI     1$              ;BRANCH IF YES
2336  012116  104023                          ERROR +23               ;INDICATE CONTROLLER READY NOT SET
2337  012120  005013                  1$:     CLR     @CDS            ;DISABLE FURTHER INTERRUPTS
2338  012122  012712  000232                 MOV     #232,@ADINT     ;RESTORE INTERRUPT RETURN ADDRESS
2339  012126  005037  000232                 CLR     @#232           ;TO 'HALT' IF AN UNEXPECTED INTERRUPT
2340                                                                  ;OCCURS
2341  012132  022626                          CMP     (SP)+,(SP)+     ;RESET STACK FROM THE INTERRUPT
2342  012134  022715  044230                 CMP     #BUFBEG+242,@CDA ;WERE 2 CARDS READ??
2343  012140  001404                          BEQ     T31END          ;BRANCH IF APPARENTLY SO
2344  012142  012737  044230  001210         MOV     #BUFBEG+242,$TMP4 ;STORE GOOD DATA - SHOULD BE
2345  012150  104033                          ERROR +33               ;BUS ADDRESS DOESN'T CORRELATE
2346                                                                  ;TO HAVING READ 2 CARDS
2347  012152                          T31END:
2348
2349                                  ;*****************************************************************
2350                                  ;*TEST 32       BUS ADDRESS ODD & TRANSFER IN NON-PACK MODE
2351                                  ;*****************************************************************
2352  012152  000004                  T32:    SCOPE
2353  012154  004737  025442                  JSR     PC,INIT                 ;INITIALIZE
2354  012160  012714  177777                  MOV     #-1,@CDC                ;SET COLUMN COUNT TO READ 1 COLUMN
2355  012164  012715  043767                  MOV     #BUFBEG+1,@CDA          ;SET BUFFER ADDRESS, FOR COLUMN DUMP,
2356                                                                          ;TO HIGH BYTE OF WORD
2357  012170  012737  012214  000010          MOV     #2$,RESVEC              ;SET RETURN FOR ILLEGAL INSTRUCTION
2358  012176  012737  000340  000012          MOV     #340,RESVEC+2           ;SET PS FOR ILLEGAL INSTRUCTION
2359  012204  005213                          INC     @CDS                    ;READ A CARD
2360  012206  105713                  1$:     TSTB    @CDS                    ;WAIT FOR CONTROLLER READY
2361  012210  100376                          BPL     1$                      ;WAIT TILL DONE!
2362  012212  000402                          BR      3$                      ;GO TO NEXT TEST
2363  012214  104070                  2$:     ERROR +70                       ;ODD BUS ADDRESS CAUSED A TRAP IN
2364                                                                          ;NON- PACK MODE
2365  012216  022626                          CMP     (SP)+,(SP)+             ;RESET STACK FROM ILLEGAL INSTRUCTION
2366                                                                          ;TRAP
2367  012220  012737  000012  000010  3$:     MOV     #12,10                  ;RESTORE TRAPCATCHER AREA FOR
2368  012226  005037  000012                  CLR     @#12                    ;UNEXPECTED TRAPS TO LOCATION 10
2369                                  ;CHECK SW7 AND RETURN TO TEST1 IF SET, AFTER RINGING BELL
2370                                  ;OTHERWISE GO INTO THE DATA TEST
2371  012232  000004                  ENDCK:  SCOPE
2372  012234  032777  000200  166674          BIT     #200,@SWR       ;IS SW<07> SET?
2373  012242  001406                          BEQ     DATST           ;BRANCH IF NOT TO DATA TESTING
2374  012244  104400  001222                  TYPE,   $BELL           ;RING-A-DING
2375  012250  005137  001254                  COM     TRFLG           ;TOGGLE TRACE FLAG
2376  012254  000137  002504                  JMP     RESTRT          ;GO BACK TO INSTRUCTION TESTS
```

```
2377
2378
                ;/*\:/*\:/*\:/*\:/*\:/*\:/*\:/*\:/*\:/*\:/*\:/*\:/*\:/*\:/*\:/*\:/*\:/*\:/*\:/*\:
                ;/*\:/*\:/*\:/*\:/*\:/*\:/*\:/*\:/*\:/*\:/*\:/*\:/*\:/*\:/*\:/*\:/*\:/*\:/*\:/*\:

                        ;THIS MARKS THE END OF THE INSTRUCTION TESTING
                        ;THIS SECTION REQUIRED 16 CARDS FOR COMPLETION

                ;/:\*/:\*/:\*/:\*/:\*/:\*/:\*/:\*/:\*/:\*/:\*/:\*/:\*/:\*/:\*/:\*/:\*/:\*/:\*/:\*
                ;/:\*/:\*/:\*/:\*/:\*/:\*/:\*/:\*/:\*/:\*/:\*/:\*/:\*/:\*/:\*/:\*/:\*/:\*/:\*/:\*

2389
2390
2391
2392
2393
2394                                    ;*************************************************************************
2395                                    ;DATA RELIABILITY TEST FOR CD11
2396                                    ;*************************************************************************
2397
2398                                    ;CHECK SWR FOR TYPE OF DECK BEING TESTED, AND INITIALIZE POINTERS
2399  012260  104400  031003           DATST:  TYPE,   MDATA   ;INDICATE "ENTERING DATA TESTS"
2400  012264  005037  001212                   CLR     $TMPS   ;INITIALIZE TABLE OFFSET FOR CARD #1 OF DECK
2401  012270  005037  015300                   CLR     CLCNT           ;MAKE SURE COLUMN COUNT IS ZERO
2402  012274  005037  015276                   CLR     CDCNT           ;SETUP CARD COUNT TO ENTER DATA TABLE AT BEGINNING
2403  012300  005037  001260                   CLR     ERFLG           ;FLAG SET PREVENTS PRINTING OUT ERROR HEADING
2404  012304  032777  000020  166624         BIT     #20,    @SWR    ;CHECK BIT 4 OF @SWR FOR TYPE OF DECK
2405  012312  001412                         BEQ     ALP1            ;BRANCH IF NOT SET TO LOAD ALPHANUMERIC POINTERS
2406  012314  012737  027656  015272         MOV     #BINCD, TSTART  ;BIT 2 SET, LOAD BINARY TABLE POINTERS
2407  012322  012737  030116  015274         MOV     #BINEND+2,TEND
2408  012330  012737  033073  014540         MOV     #MSG15, DECK
2409  012336  000411                         BR      CONTD           ;BRANCH AROUND ALPHANUMERIC POINTERS
2410  012340  012737  027276  015272  ALP1:  MOV     #ALPCD, TSTART  ;LOAD ALPHANUMERIC TABLE POINTERS
2411  012346  012737  027536  015274         MOV     #ALPEND+2,TEND
2412  012354  012737  033062  014540         MOV     #MSG14, DECK
2413  012362  005737  001254         CONTD:  TST     TRFLG           ;CHECK TRACE TRAP FLAG
2414  012366  001006                         BNE     TRP1            ;BRANCH IF FLAG WAS SET
2415  012370                         NOTRP1:
2416  012370  013746  000340                 MOV     PR7,-(SP)       ;;PUT NEW PS ON STACK
2417  012374  012746  012402                 MOV     #64$,-(SP)      ;;PUT NEW PC ON  STACK
2418  012400  000002                         RTI                     ;; POP NEW PC AND PS
2419  012402                         64$:
2420  012402  000411                         BR      DCNT1
2421  012404  032777  010000  166524 TRP1:   BIT     #10000, @SWR    ;CHECK SW12 TO INHIBIT TRACE TRAPPING
2422  012412  001366                         BNE     NOTRP1          ;BRANCH IF SET
2423  012414  013746  000360                 MOV     TRACE,-(SP)     ;;PUT NEW PS ON STACK
2424  012420  012746  012426                 MOV     #64$,-(SP)      ;;PUT NEW PC ON  STACK
2425  012424  000002                         RTI                     ;; POP NEW PC AND PS
2426  012426                         64$:
2427  012426  004737  025442         DCNT1:  JSR     PC,     INIT    ;INITIALIZE CARD READER STATUS REGISTER
2428
2429                                    ;SET UP INTERRUPT SERVICING, AND START READING
2430  012432  012712  012674                 MOV     #SRVC,  @ADINT  ;SETUP RETURN POINTER
```

```
2431                                                    ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
2432  012436  005046                                    CLR     -(SP)           ;;
2433  012440  013746  000034                            MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
2434  012444  012737  012454  000034                    MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
2435  012452  104400                                    TRAP                    ;;PUSH OLD PSW AN PCON STACK
2436  012454  016666  000002  000006  64$:    MOV     2(SP),6(SP)     ;;
2437  012462  012716  012470                            MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
2438  012466  000002                                    RTI                     ;;RESTORE PSW
2439  012470  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
2440  012474  012637  001214                    MOV     (SP)+,$TMP6
2441  012500  042737  000340  001214            BIC     #340,$TMP6
2442  012506  013746  001214                    MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
2443  012512  012746  012520                    MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
2444  012516  000002                            RTI                     ;; POP NEW PC AND PS
2445  012520                          66$:
2446                                                    ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
2447  012520  005046                                    CLR     -(SP)           ;;
2448  012522  013746  000034                            MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
2449  012526  012737  012536  000034                    MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
2450  012534  104400                                    TRAP                    ;;PUSH OLD PSW AN PCON STACK
2451  012536  016666  000002  000006  67$:    MOV     2(SP),6(SP)     ;;
2452  012544  012716  012552                            MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
2453  012550  000002                                    RTI                     ;;RESTORE PSW
2454  012552  012637  000034          68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
2455  012556  012662  000002                    MOV     (SP)+,2(ADINT)
2456  012562  013701  015272                    MOV     TSTART, R1      ;SET UP TABLE POINTER
2457  012566  012700  043766                    MOV     #BUFBEG,R0      ;SET UP BUFFER POINTER
2458  012572  012737  177660  015260            MOV     #-120,  SIZE    ;SET UP "SIZE"
2459  012600  012737  177660  015262            MOV     #-120,  OFFSET
2460  012606  013714  015260                    MOV     SIZE,   @CDC    ;SET UP COLUMN COUNT
2461  012612  010015                            MOV     R0,     @CDA    ;SET UP ADDRESS REG
2462  012614  012713  000100                    MOV     #100,   @CDS    ;ENABLE INTERRUPTS
2463  012620  032777  000010  166310            BIT     #10,    @SWR    ;CHECK FOR PACK MODE ONLY
2464  012626  001406                            BEQ     CDREAD          ;BRANCH IF NOT SET
2465  012630  032777  000004  166300            BIT     #4,@SWR         ;CHECK FOR IMAGE MODE ONLY
2466  012636  001002                            BNE     CDREAD          ;BRANCH IF SET
2467  012640  004737  014466                    JSR     PC,     PAKSET  ;SET UP FOR PACKING MODE
2468  012644  005213                  CDREAD: INC     @CDS            ;READ
2469  012646  032713  004000          BKGND:  BIT     #4000,  @CDS    ;CHECK FOR DATA ERROR
2470  012652  001775                            BEQ     BKGND
2471  012654  011437  015304                    MOV     @CDC,   DERCNT  ;SAVE THE COLUMN COUNT
2472  012660  032713  004000          BKGND1: BIT     #4000,  @CDS    ;CHECK FOR DATA ERROR
2473  012664  001375                            BNE     BKGND1          ;BRANCH IF SET
2474  012666  005037  015304                    CLR     DERCNT          ;CLR COLUMN COUNT SAVER
2475  012672  000765                            BR      BKGND
2476
2477                                                    ;INTERRUPT SERVICE ROUTINE WHICH RUNS DATA RELIABILITY TEST
2478  012674  105713                  SRVC:   TSTB    @CDS            ;CHECK CONTROLLER READY
2479  012676  100401                            BMI     1$              ;BRANCH IF SET
2480  012700  104023                            ERROR +23                       ;CONTROLLER READY NOT SET
2481  012702  032713  000002          1$:     BIT     #2,     @CDS    ;CHECK FOR DATA PACK MODE
2482  012706  001402                            BEQ     ISR             ;BRANCH IF IMAGE MODE
2483  012710  000137  013604                    JMP     PSR             ;JUMP TO PACK MODE ROUTINE
2484
```

```
 2485  012714  032713  177477          ISR:    BIT     #177477,@CDS    ;CHECK ALL BITS EXCEPT 6 AND 7
 2486  012720  001001                          BNE     1$              ;BRANCH TO ERROR ROUTINE
 2487  012722  000402                          BR      2$              ;OTHERWISE, CONTINUE ON
 2488  012724  000137  013454          1$:     JMP     ISRER           ;GO TO ERROR ROUTINE
 2489  012730  005714                  2$:     TST     @CDC            ;CHECK COLUMN COUNT
 2490  012732  001403                          BEQ     3$              ;BRANCH IF OK
 2491  012734  005037  001210                  CLR     $TMP4           ;CORRECT 'CDC' CONTENTS FOR ERROR REPORT
 2492  012740  104034                          ERROR +34                       ;COLUMN COUNT REGISTER NOT 0
 2493
 2494  012742  010037  015264          3$:     MOV     R0,     BUFEND
 2495  012746  163737  015260  015264          SUB     SIZE,   BUFEND
 2496  012754  163737  015260  015264          SUB     SIZE,   BUFEND
 2497  012762  023715  015264                  CMP     BUFEND, @CDA
 2498  012766  001404                          BEQ     ISRNC
 2499  012770  013737  015264  001210          MOV     BUFEND,$TMP4    ;CORRECT 'CDA' CONTENTS FOR ERROR REPORT
 2500  012776  104033                          ERROR +33
 2501
 2502  013000  013737  015260  001250  ISRNC:  MOV     SIZE,   COUNT   ;SET UP COLUMN COUNTER
 2503  013006  005777  166226          ISRLP:  TST     @CDDB           ;ARE WE ON A CARD READER WITH
 2504                                          ;ECO #14 INSTALLED?
 2505  013012  100411                          BMI     1$              ;BRANCH IF YES
 2506  013014  012137  001200                  MOV     (R1)+,$TMP0     ;GET THE TABLE VALUE
 2507  013020  042737  170000  001200          BIC     #170000,$TMP0   ;STRIP OFF TOP 4 BITS BEFORE COMPARISON
 2508  013026  023720  001200                  CMP     $TMP0,(R0)+     ;IS VALUE SAME AS DUMPED INTO MEMORY?
 2509  013032  001043                          BNE     ISRDE           ;BRANCH IF NOT THE SAME
 2510  013034  000402                          BR      ISRRT           ;OTHERWISE, CONTINUE ON
 2511  013036  022021                  1$:     CMP     (R0)+,  (R1)+   ;TEST THE DATA
 2512  013040  001040                          BNE     ISRDE           ;BRANCH IF DATA ERROR
 2513  013042  020137  015274          ISRRT:  CMP     R1,     TEND    ;CHECK FOR END OF TABLE
 2514  013046  100402                          BMI     1$              ;BRANCH IF NOT
 2515  013050  013701  015272                  MOV     TSTART, R1      ;MOVE POINTER TO TOP OF TABLE
 2516  013054  005237  001250          1$:     INC     COUNT           ;CHECK FOR END OF BUFFER
 2517  013060  001415                          BEQ     ISRBE           ;BRANCH IF BUFFER END
 2518  013062  005237  015300                  INC     CLCNT           ;KEEP TRACK OF COLUMNS
 2519  013066  062737  000002  001212          ADD     #2,$TMPS        ;UPDATE TABLE OFFSET FOR CARD #1 OF DECK
 2520  013074  023727  015300  000120          CMP     CLCNT,  #120    ;CHECK FOR END OF CARD
 2521  013102  001341                          BNE     ISRLP           ;BRANCH IF NOT END OF CARD
 2522  013104  004737  014654                  JSR     PC,     NXCRD   ;INC TO NEXT CARD
 2523  013110  005721                          TST     (R1)+           ;UPDATE TABLE POINTER FOR NEXT CARD
 2524  013112  000735                          BR      ISRLP
 2525
 2526  013114  004737  014654          ISRBE:  JSR     PC,     NXCRD   ;GO TO NEXT CARD
 2527  013120  005721                  ISRNX:  TST     (R1)+
 2528  013122  032777  000004  166006          BIT     #4,     @SWR    ;CHECK FOR IMAGE MODE ONLY
 2529  013130  001002                          BNE     ISRNX1          ;BRANCH IF SET
 2530  013132  004737  014466                  JSR     PC,     PAKSET  ;SET UP FOR PACKING MODE
 2531  013136  000137  014402          ISRNX1: JMP     SRETRN          ;CALCULATE "SIZE" AND RETURN
 2532
 2533                                  ;DATA ERROR WAS DETECTED, OUTPUT ERROR PRINTOUT
 2534  013142  005737  015276          ISRDE:  TST     CDCNT           ;CHECK FOR FIRST CARD
 2535  013146  001102                          BNE     ISRD2           ;BRANCH IF NOT
 2536  013150  005740                  ISRD1:  TST     -(R0)           ;SUB 2 FROM POINTER
 2537  013152  005237  015276                  INC     CDCNT
 2538  013156  005777  166056                  TST     @CDDB           ;ARE WE ON A CARD READER WITH
```

```
2539
2540  013162  100411                        BMI     1$              ;ECO #14 INSTALLED?
2541  013164  012137  001200                MOV     (R1)+,$TMPO     ;BRANCH IF YES
2542  013170  042737  170000  001200        BIC     #170000,$TMPO   ;GET THE TABLE VALUE
2543  013176  023720  001200                CMP     $TMPO,(R0)+     ;STRIP OFF TOP 4 BITS BEFORE COMPARISON
2544  013202  001051                        BNE     6$              ;DOES VALUE MATCH THAT DUMPED INTO MEMORY?
2545  013204  000402                        BR      2$              ;BRANCH IF NO
2546  013206  022021                1$:     CMP     (R0)+,  (R1)+   ;OTHERWISE, CONTINUE ON
2547  013210  001046                        BNE     6$              ;TEST THE DATA
2548  013212  062701  000042        2$:     ADD     #42,    R1      ;BRANCH IF NOT THE SAME
2549  013216  020137  015274                CMP     R1,     TEND    ;ADD THE MAGIC NUMBER
2550  013222  003402                        BLE     3$              ;CHECK FOR RAP AROUND
2551  013224  162701  000240                SUB     #240,   R1      ;BRANCH IF NOT
2552  013230  005777  166004        3$:     TST     @CDDB           ;RAP AROUND
2553                                        ;ECO #14 INSTALLED?     ;ARE WE ON A CARD READER WITH
2554  013234  100412                        BMI     7$              ;BRANCH IF YES
2555  013236  011137  001200                MOV     (R1),$TMPO      ;GET THE TABLE VALUE
2556  013242  042737  170000  001200        BIC     #170000,$TMPO   ;STRIP OFF TOP 4 BITS BEFORE COMPARISON
2557  013250  026037  000042  001200        CMP     42(R0),$TMPO    ;DOES VALUE MATCH FOR A DOUBLE?
2558  013256  001014                        BNE     5$              ;BRANCH IF NO
2559  013260  000403                        BR      4$              ;OTHERWISE, CONTINUE ON
2560  013262  026011  000042        7$:     CMP     42(R0), (R1)    ;CHECK FOR DOUBLE MATCH
2561  013266  001010                        BNE     5$              ;BRANCH IF NOT
2562  013270  162701  000042        4$:     SUB     #42,    R1      ;SUBTRACT THE MAGIC NUMBER
2563  013274  020137  015272                CMP     R1,     TSTART  ;CHECK FOR RAP AROUND
2564  013300  003260                        BGT     ISRRT           ;BRANCH IF NOT
2565  013302  062701  000240                ADD     #240,   R1      ;RAP AROUND
2566  013306  000655                        BR      ISRRT           ;GO CHECK REST OF DATA
2567
2568  013310  162701  000042        5$:     SUB     #42,    R1      ;SUBTRACT MAGIC NUMBER
2569  013314  020137  015272                CMP     R1,     TSTART  ;CHECK FOR RAP AROUND
2570  013320  003002                        BGT     6$              ;BRANCH IF NOT
2571  013322  062701  000240                ADD     #240,   R1      ;RAP AROUND
2572  013326  020137  015274        6$:     CMP     R1,     TEND
2573  013332  001306                        BNE     ISRD1
2574  013334  013701  015272                MOV     TSTART,R1       ;OBTAIN THE 1ST TABLE ENTRY
2575  013340  063701  001212                ADD     $TMPS,R1        ;ADD TABLE OFFSET FOR CARD #1 OF DECK
2576  013344  062701  000002                ADD     #2,R1           ;GO AHEAD ONE TABLE POSITION FOR ERROR REPORT
2577  013350  005037  015276                CLR     CDCNT           ;RESET CARD COUNTER
2578  013354  032777  020000  165554  ISRD2: BIT     #20000,@SWR     ;CK SW13 FOR INHIBIT PRINTOUT
2579  013362  001026                        BNE     ISRDE4          ;BRANCH IF SET
2580  013364  004737  014520                JSR     PC,     TYHEAD  ;TYPE HEADING, DECK, CDCNT, CLCNT
2581  013370  005777  165644                TST     @CDDB           ;ARE WE ON A CARD READER WITH
2582                                        ;ECO #14 INSTALLED?
2583  013374  100410                        BMI     1$              ;BRANCH IF YES
2584  013376  014137  001200                MOV     -(R1),$TMPO     ;GET THE TABLE VALUE
2585  013402  042737  170000  001200        BIC     #170000,$TMPO   ;STRIP OFF TOP 4 BITS BEFORE PRINTOUT
2586  013410  013746  001200                MOV     $TMPO,-(SP)     ;PLACE VALUE ON STACK FOR PRINTOUT
2587  013414  000401                        BR      2$              ;GO TO PRINT OUT VALUE
2588  013416  014146                1$:     MOV     -(R1),-(SP)     ;PUSH SHOULD BE DATA ONTO STACK
2589  013420  104402                2$:     TYPOS                   ;SYSMAC ROUTINE
2590  013422     006                        .BYTE   6               ;FOR
2591  013423     001                        .BYTE   1               ;ERROR TYPEOUT
2592  013424  104400  030243                TYPE,   SPACE
```

```
2593  013430  014046                          MOV     -(R0),-(SP)     ;PUSH WAS DATA
2594  013432  104402                          TYPOS                   ;ONTO STACK
2595  013434      006                          .BYTE   6               ;FOR
2596  013435      001                          .BYTE   1               ;ERROR TYPEOUT
2597  013436  022021                          CMP     (R0)+,  (R1)+   ;RESET POINTERS
2598  013440  005777  165472        ISRDE4:   TST     @SWR            ;CHECK FOR HALT ON ERROR
2599  013444  100001                          BPL     1$              ;BRANCH IF HALT ON ERROR NOT SET
2600  013446  000000                          HALT                    ;HALT ON ERROR SET
2601  013450  000137  013042        1$:       JMP     ISRRT
2602
2603                                ;INTERRUPT DUE TO SOME KIND OF ERROR
2604                                ;THESE ERRORS ARE DISASTEROUS, THEREFORE THE DATA TEST IS RESTARTED
2605  013454  100402                ISRER:    BMI     ISRE1           ;BRANCH ON ERROR BIT IS
2606  013456  104026                          ERROR +26               ;ERROR BIT IS NOT SET
2607  013460  000447                          BR      ISRST
2608
2609  013462  032713  010000        ISRE1:    BIT     #10000, @CDS    ;CHECK FOR OFF-LINE
2610  013466  001414                          BEQ     ISRE2
2611  013470  032713  040000                  BIT     #40000, @CDS    ;CHECK FOR CARD READER ERROR
2612  013474  001002                          BNE     1$              ;BRANCH IF SET
2613  013476  104035                          ERROR +35               ;OFF-LINE BUT NOT CARD READER ERROR
2614  013500  000413                          BR      ISRE3
2615
2616  013502  004737  014614        1$:       JSR     PC,     LASTCD  ;CHECK FOR LAST CARD
2617  013506  002002                          BGE     2$              ;BRANCH IF BOTH CARD
2618  013510  104057                          ERROR +57               ;CARD READER ERROR BUT NOT BOTH CARD
2619  013512  000432                          BR      ISRST
2620  013514  000137  013000        2$:       JMP     ISRNC           ;IF BOTH CARD - GO HERE!
2621
2622  013520  032713  040000        ISRE2:    BIT     #40000, @CDS    ;CHECK FOR CARD READER ERROR
2623  013524  001401                          BEQ     ISRE3           ;BRANCH IF NOT
2624  013526  104060                          ERROR +60               ;CARD READER ERROR BUT NOT OFF LINE
2625
2626  013530  032713  020000        ISRE3:    BIT     #20000, @CDS
2627  013534  001401                          BEQ     1$
2628  013536  104061                          ERROR +61               ;END OF FILE ERROR (M1200 ONLY)
2629
2630  013540  032713  004000        1$:       BIT     #4000,  @CDS
2631  013544  001401                          BEQ     2$
2632  013546  104062                          ERROR +62               ;DATA ERROR
2633
2634  013550  032713  002000        2$:       BIT     #2000,  @CDS
2635  013554  001401                          BEQ     3$
2636  013556  104063                          ERROR +63               ;DATA LATE ERROR
2637
2638  013560  032713  001000        3$:       BIT     #1000,  @CDS
2639  013564  001401                          BEQ     4$
2640  013566  104064                          ERROR +64               ;NON-EXISTANT MEMORY ERROR
2641  013570  032713  077000        4$:       BIT     #077000,@CDS    ;CHECK ALL ERROR BITS
2642  013574  001001                          BNE     ISRST           ;BRANCH IF AT LEAST ONE
2643  013576  104037                          ERROR +37               ;NONE OF THE ERROR BITS SET
2644  013600  000137  015252        ISRST:    JMP     DATRST          ;RESTART THE ENTIRE DATA TEST
2645
2646  013604  032713  177475        PSR:      BIT     #177475,@CDS    ;CHECK ALL BITS EXCEPT 1,6 AND 7
```

```
 2647  013610  001402                          BEQ     1$              ;BRANCH IF OK!
 2648  013612  000137  014222                  JMP     PSRER           ;OTHERWISE, GO TO REPORT ERROR
 2649  013616  005714                  1$:     TST     @CDC            ;CHECK COLUMN COUNT REG.
 2650  013620  001403                          BEQ     2$              ;BRANCH IF OK
 2651  013622  005037  001210                  CLR     $TMP4           ;CORRECT 'CDC' CONTENTS FOR ERROR REPORT
 2652  013626  104034                          ERROR +34               ;
 2653  013630  010037  015264          2$:     MOV     R0,     BUFEND
 2654  013634  163737  015260  015264          SUB     SIZE,   BUFEND
 2655  013642  023715  015264                  CMP     BUFEND, @CDA
 2656  013646  001404                          BEQ     PSRNC
 2657  013650  013737  015264  001210          MOV     BUFEND,$TMP4    ;CORRECT 'CDA' CONTENTS FOR ERROR REPORT
 2658  013656  104033                          ERROR +33
 2659  013660  013737  015260  001250  PSRNC:  MOV     SIZE,   COUNT   ;SET UP COLUMN COUNTER
 2660  013666  122021                  PSRLP:  CMPB    (R0)+,  (R1)+   ;TEST THE DATA
 2661  013670  001052                          BNE     PSRDE           ;BRANCH IF DATA ERROR
 2662  013672  020137  015274          PSRRT:  CMP     R1,     TEND    ;CHECK FOR END OF TABLE
 2663  013676  100402                          BMI     1$              ;BRANCH IF NOT
 2664  013700  013701  015272                  MOV     TSTART, R1      ;MOVE POINTER TO TOP OF TABLE
 2665  013704  005237  001250          1$:     INC     COUNT           ;CHECK FOR END OF BUFFER
 2666  013710  001415                          BEQ     PSRBE           ;BRANCH IF BUFFER END
 2667  013712  005237  015300                  INC     CLCNT           ;KEEP TRACK OF COLUMNS
 2668  013716  062737  000001  001210          ADD     #1,$TMP4        ;UPDATE TABLE OFFSET FOR CARD #1 OF DECK
 2669  013724  023727  015300  000120          CMP     CLCNT,  #120    ;CHECK FOR END OF CARD
 2670  013732  001355                          BNE     PSRLP           ;BRANCH IF NOT END OF CARD
 2671  013734  004737  014654                  JSR     PC,     NXCRD   ;GO TO NEXT CARD
 2672  013740  105721                          TSTB    (R1)+           ;UPDATE TABLE POINTER FOR NEXT CARD
 2673  013742  000751                          BR      PSRLP
 2674
 2675  013744  004737  014654  PSRBE:  JSR     PC,     NXCRD   ;GO TO NEXT CARD
 2676  013750  105721          PSRNX:  TSTB    (R1)+
 2677  013752  032777  000010  165156          BIT     #10,    @SSR
 2678  013760  001014                          BNE     PSRNX1
 2679  013762  162737  000240  015272          SUB     #160.,  TSTART  ;MOVE TABLE POINTER TO IMAGE TABLE
 2680  013770  162737  000120  015274          SUB     #80.,   TEND
 2681  013776  162701  000240                  SUB     #160.,  R1      ;UPDATE TABLE POINTER
 2682  014002  063701  015276                  ADD     CDCNT,  R1      ;COMPENSATE FOR BYTES
 2683  014006  042713  000002                  BIC     #2,     @CDS    ;CLR PACKING MODE BIT
 2684  014012  000137  014402          PSRNX1: JMP     SRETRN          ;CALCULATE "SIZE" AND READ MORE CARDS
 2685
 2686                                  ;DATA ERROR WAS DETECTED, OUTPUT ERROR PRINTOUT
 2687  014016  005737  015276          PSRDE:  TST     CDCNT
 2688  014022  001051                          BNE     PSRD2
 2689  014024  105740          PSRD1:  TSTB    -(R0)           ;SUB 1 FROM POINTER
 2690  014026  005237  015276                  INC     CDCNT
 2691  014032  122021                          CMPB    (R0)+,  (R1)+   ;TEST THE DATA
 2692  014034  001031                          BNE     1$              ;BRANCH IF NOT THE SAME
 2693  014036  062701  000021                  ADD     #21,    R1      ;ADD THE MAGIC NUMBER
 2694  014042  020137  015274                  CMP     R1,     TEND    ;CHECK FOR RAP AROUND
 2695  014046  003402                          BLE     2$              ;BRANCH IF NOT
 2696  014050  162701  000120                  SUB     #120,   R1      ;RAP AROUND
 2697  014054  126011  000021          2$:     CMPB    21(R0), (R1)    ;CHECK FOR DOUBLE MATCH
 2698  014060  001010                          BNE     3$              ;BRANCH IF NOT
 2699  014062  162701  000021                  SUB     #21,    R1      ;SUBTRACT THE MAGIC NUMBER
 2700  014066  020137  015272                  CMP     R1,     TSTART  ;CHECK FOR RAP AROUND
```

```
2701  014072  003277                          BGT     PSRRT           ;BRANCH IF NOT
2702  014074  062701  000120                  ADD     #120,   R1      ;RAP AROUND
2703  014100  000674                          BR      PSRRT           ;GO CHECK REST OF DATA
2704
2705  014102  162701  000021          3$:     SUB     #21,    R1      ;SUBTRACT MAGIC NUMBER
2706  014106  020137  015272                  CMP     R1,     TSTART  ;CHECK FOR RAP AROUND
2707  014112  003002                          BGT     1$              ;BRANCH IF NOT
2708  014114  062701  000120                  ADD     #120,   R1      ;RAP AROUND
2709  014120  020137  015274          1$:     CMP     R1,     TEND
2710  014124  001337                          BNE     PSRD1
2711  014126  013701  015272                  MOV     TSTART,R1       ;OBTAIN THE 1ST TABLE ENTRY
2712  014132  063701  001212                  ADD     $TMPS,R1        ;ADD TABLE OFFSET FOR CARD #1 OF DECK
2713  014136  062701  000001                  ADD     #1,R1           ;GO AHEAD ONE TABLE POSITION FOR ERROR REPORT
2714  014142  005037  015276                  CLR     CDCNT           ;RESET CARD COUNTER
2715  014146  032777  020000  164762  PSRD2:  BIT     #20000,@SWR     ;CK SW13 FOR INHIBIT PRINTOUT
2716  014154  001015                          BNE     PSRDE3          ;BRANCH IF SET
2717  014156  004737  014520                  JSR     PC,     TYHEAD  ;TYPE HEADING, DECK, CDCNT, CLCNT
2718  014162  104400  030243                  TYPE,   SPACE
2719  014166  114146                          MOVB    -(R1),-(SP)     ;PUSH SHOULD BE DATA
2720  014170  104402                          TYPOS                   ;ONTO STACK
2721  014172     003                          .BYTE   3               ;FOR
2722  014173     000                          .BYTE   0               ;ERROR TYPEOUT
2723  014174  104400  030240                  TYPE,   SPACE-3
2724  014200  114046                          MOVB    -(R0),-(SP)     ;PUSH WAS DATA
2725  014202  104402                          TYPOS                   ;ONTO STACK
2726  014204     003                          .BYTE   3               ;FOR
2727  014205     000                          .BYTE   0               ;ERROR TYPEOUT
2728  014206  122021                          CMPB    (R0)+,  (R1)+   ;RESET POINTERS
2729  014210  005777  164722          PSRDE3: TST     @SWR            ;CHECK FOR HALT ON ERROR
2730  014214  100001                          BPL     1$              ;BRANCH IF HALT ON ERROR NOT SET
2731  014216  000000                          HALT                    ;HALT ON ERROR SET
2732  014220  000624                  1$:     BR      PSRRT
2733
2734                                  ;INTERRUPT DUE TO SOME KIND OF ERROR
2735  014222  100402                  PSRER:  BMI     PSRE1           ;BRANCH ON ERROR BIT 15
2736  014224  104026                          ERROR +26                       ;ERROR BIT 15 NOT SET
2737  014226  000463                          BR      PSRST
2738
2739  014230  032713  004000          PSRE1:  BIT     #4000,  @CDS
2740  014234  001414                          BEQ     PSRE2           ;BRANCH IF NOT
2741  014236  032713  000002                  BIT     #2,     @CDS
2742  014242  001001                          BNE     1$
2743  014244  104065                          ERROR +65
2744  014246  032777  000020  164662  1$:     BIT     #20,    @SWR
2745  014254  001001                          BNE     2$              ;BRANCH IF BINARY DECK
2746  014256  104066                          ERROR +66
2747  014260  012737  177660  001250  2$:     MOV     #-120,  COUNT   ;ONLY READ ONE CARD
2748  014266  032713  010000          PSRE2:  BIT     #10000, @CDS    ;CHECK FOR OFF-LINE
2749  014272  001415                          BEQ     PSRE3
2750  014274  032713  040000                  BIT     #40000, @CDS    ;CHECK FOR CARD READER ERROR
2751  014300  001002                          BNE     1$              ;BRANCH IF SET
2752  014302  104035                          ERROR +35                       ;OFF-LINE BUT NOT CARD READER ERROR
2753  014304  000414                          BR      PSRE4
2754
```

```
2755  014306  004737  014614          1$:     JSR     PC,     LASTCD  ;CHECK FOR LAST CARD
2756  014312  002402                          BLT     2$              ;BRANCH IF NOT
2757  014314  000137  013660                  JMP     PSRNC           ;BRANCH IF BOTH CARD
2758  014320  104057                  2$:     ERROR +57               ;CARD READER ERROR BUT NOT BOTH CARD
2759  014322  000137  015252                  JMP     DATRST          ;RESTART THE ENTIRE TEST
2760
2761  014326  032713  040000          PSRE3:  BIT     #40000, @CDS    ;CHECK FOR CARD READER ERROR
2762  014332  001401                          BEQ     PSRE4           ;BRANCH IF NOT
2763  014334  104060                          ERROR +60               ;CARD READER ERROR BUT NOT OFF LINE
2764
2765  014336  032713  020000          PSRE4:  BIT     #20000, @CDS
2766  014342  001401                          BEQ     1$
2767  014344  104061                          ERROR +61               ;END OF FILE ERROR (M1200 ONLY)
2768
2769  014346  032713  002000          1$:     BIT     #2000,  @CDS
2770  014352  001401                          BEQ     2$
2771  014354  104063                          ERROR +63               ;DATA LATE ERROR
2772
2773  014356  032713  001000          2$:     BIT     #1000,  @CDS
2774  014362  001401                          BEQ     3$
2775  014364  104064                          ERROR +64               ;NON-EXISTANT MEMORY ERROR
2776  014366  032713  077000          3$:     BIT     #077000,@CDS    ;CHECK ALL ERROR BITS
2777  014372  001001                          BNE     PSRST           ;BRANCH IF AT LEAST ONE
2778  014374  104037                          ERROR +37               ;NONE OF THE ERROR BITS SET
2779  014376  000137  013666          PSRST:  JMP     PSRLP           ;GO CHECK THE DATA
2780
2781                                  ;RETURN PORTION OF INTERRUPT SERVICE ROUTINE
2782                                  ;CALCULATES A NEW "SIZE" (NUMBER OF COLUMNS TO BE READ)
2783                                  ;SETS UP THE CARD READER BUFFERS, AND ISSUES THE READ COMMAND
2784                                  ;THEN DOES AN RTI TO THE BACKGROUND ROUTINE
2785  014402  063737  015262  015260  SRETRN: ADD     OFFSET, SIZE
2786  014410  100404                          BMI     SRETR1
2787  014412  012737  177660  015262          MOV     #-120,  OFFSET
2788  014420  000770                          BR      SRETRN
2789  014422  032737  001000  015260  SRETR1: BIT     #001000,SIZE
2790  014430  001004                          BNE     SRETR4
2791  014432  012737  000120  015262  SRETR3: MOV     #120,   OFFSET
2792  014440  000760                          BR      SRETRN
2793  014442  004737  014614          SRETR4: JSR     PC,     LASTCD  ;CHECK FOR MORE THAN 80 CARDS
2794  014446  003371                          BGT     SRETR3          ;BRANCH IF GREATER
2795  014450  013714  015260                  MOV     SIZE,   @CDC    ;SET UP COLMN COUNT
2796  014454  012700  043766                  MOV     #BUFBEG,R0      ;RESET TABLE POINTER
2797  014460  010015                          MOV     R0,     @CDA    ;SET UP ADDRESS REG
2798  014462  005213                          INC     @CDS            ;READ
2799  014464  000002                          RTI
2800
2801
2802                                  ;SUBROUTINE TO SET PACKING MODE AND MOVE THE POINTERS FOR THE DATA.
2803  014466  062737  000240  015272  PAKSET: ADD     #160.,  TSTART  ;MOVE TABLE POINTER TO PACKED TABLE
2804  014474  062737  000120  015274          ADD     #80.,   TEND
2805  014502  062701  000240                  ADD     #160.,  R1      ;UPDATE TABLE POINTER
2806  014506  163701  015276                  SUB     CDCNT,  R1      ;COMPENSATE FOR BYTES
2807  014512  052713  000002                  BIS     #2,     @CDS    ;SET PACKING MODE BIT
2808  014516  000207                          RTS     PC
```

```
2809
2810                                        ;SUBROUTINE TO TYPE HEADING, TYPE OF DECK, CARD COUNT, AND COLUMN COUNT
2811  014520  005737  001260          TYHEAD: TST     ERFLG           ;CHECK FOR FIRST ERROR
2812  014524  001004                          BNE     NOHEAD          ;BRANCH IF NOT
2813  014526  005237  001260                  INC     ERFLG           ;SET FLAG
2814  014532  104400  033003                  TYPE,   MSG13           ;TYPE HEADING FOR DATA ERRORS
2815  014536  104400                  NOHEAD: TYPE                    ;OUTPUT TYPE OF DECK
2816  014540  000000                  DECK:   DUMMY                   ;POINTER TO DECK TITLE
2817  014542  104400  030243                  TYPE,   SPACE
2818  014546  005237  015276                  INC     CDCNT           ;ADJUST CADR COUNT
2819  014552  013746  015276                  MOV     CDCNT,-(SP)
2820  014556  104404                          TYPDS
2821  014560  005337  015276                  DEC     CDCNT           ;READJUST CADR COUNT
2822  014564  104400  030236                  TYPE,   SPACE-5
2823  014570  005237  015300                  INC     CLCNT           ;ADJUST COLUMN COUNT
2824  014574  013746  015300                  MOV     CLCNT,-(SP)
2825  014600  104404                          TYPDS
2826  014602  005337  015300                  DEC     CLCNT           ;READJUST COLUMN COUNT
2827  014606  104400  030241                  TYPE,   SPACE-2
2828  014612  000207                          RTS     PC
2829
2830                                        ;SUBROUTINE TO CHECK FOR LAST CARD
2831  014614  013737  015260  015266  LASTCD: MOV     SIZE,   TEMP1
2832  014622  013737  015276  015270          MOV     CDCNT,  TEMP2
2833  014630  005237  015270          LSTCD1: INC     TEMP2
2834  014634  062737  000120  015266          ADD     #120,   TEMP1
2835  014642  100772                          BMI     LSTCD1
2836  014644  023727  015270  000120          CMP     TEMP2,  #80.
2837  014652  000207                          RTS     PC
2838
2839                                        ;SUBROUTINE TO KEEP TRACK OF CARDS
2840  014654  005037  015300          NXCRD:  CLR     CLCNT           ;RESET COLUMN COUN
2841  014660  005037  001212                  CLR     $TMPS
2842  014664  005237  015276                  INC     CDCNT           ;KEEP TRACK OF CARDS
2843  014670  023727  015276  000120          CMP     CDCNT,  #120    ;CHECK FOR 80TH CARD
2844  014676  002001                          BGE     $EOP
2845  014700  000207                          RTS     PC              ;RETURN
2846
2847
2848                                        ;*****************************************************************
2849
2850                                        .SBTTL  END OF PASS ROUTINE
2851
2852                                        ;*INCREMENT THE PASS NUMBER ($PASS)
2853                                        ;*TYPE "END PASS #XXXXX" (WHERE XXXXX IS A DECIMAL NUMBER)
2854                                        ;*IF SW12=1 INHIBIT TRACE TRAP
2855                                        ;*IF THERES A MONITOR GO TO IT
2856                                        ;*IF THERE ISN'T JUMP TO HOOK1
2857
2858  014702                          $EOP:
2859  014702  005726                          TST     (SP)+           ;CORRECT STACK POINTER TO REPLACE 'RTS'
2860  014704  022626                          CMP     (SP)+,(SP)+     ;CORRECT STACK POINTER TO REPLACE 'RTI'
2861  014706  005037  001102                  CLR     $TSTNM          ;;ZERO THE TEST NUMBER
2862  014712  005037  001220                  CLR     $TIMES          ;;ZERO THE NUMBER OF ITERATIONS
```

```
 2863  014716  005237  001100                 INC     $PASS           ;;INCREMENT THE PASS NUMBER
 2864  014722  042737  100000  001100         BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
 2865  014730  005327                         DEC     (PC)+           ;;LOOP?
 2866  014732  000001              $EOPCT:    .WORD   1
 2867  014734  003032                         BGT     $DOAGN          ;;YES
 2868  014736  012737                         MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
 2869  014740  000001              $ENDCT:    .WORD   1
 2870  014742  014732                         $EOPCT
 2871  014744  104400  015114                 TYPE    ,$ENDMG         ;;TYPE "END PASS #"
 2872  014750  013746  001100                 MOV     $PASS,-(SP)     ;;SAVE $PASS FOR TYPEOUT
 2873  014754  104404                         TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
 2874  014756  104400  015131                 TYPE    ,$ENULL         ;;TYPE A NULL CHARACTER
 2875  014762                              $GET42:
 2876  014762  013700  000042                 MOV     @#42,R0         ;;GET MONITOR ADDRESS
 2877  014766  001415                         BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
 2878  014770  000005                         RESET                   ;;MONITOR,CLEAR WORLD
 2879  014772  005046                         CLR     -(SP)           ;;INSURE THE "T" BIT IS CLEAR
 2880  014774  012746  015012                 MOV     #$ENDAD,-(SP)   ;;SETUP FOR AN RTI OR RTT
 2881  015000  000441                         BR      $RTRN           ;;GO DO AN RTI OR RTT TO LOAD THE PSW
 2882                                                                 ;;WITH A CLEARED "T" BIT
 2883
 2884  015002  013700  000042                 MOV     @#42,R0         ;;GET MONITOR ADDRESS
 2885  015006  001405                         BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
 2886  015010  000005                         RESET                   ;;CLEAR THE WORLD
 2887  015012  004710              $ENDAD:    JSR     PC,(R0)         ;;GO TO MONITOR
 2888  015014  000240                         NOP                     ;;SAVE ROOM
 2889  015016  000240                         NOP                     ;;FOR
 2890  015020  000240                         NOP                     ;;ACT11
 2891  015022                              $DOAGN:
 2892  015022  005046                         CLR     -(SP)           ;;RESERVE A STACK LOC. FOR THE PS
 2893  015024  013746  000034                 MOV     @#34,-(SP)      ;;SETUP THE TRAP VECTOR
 2894  015030  012737  015040  000034         MOV     #1$,@#34        ;; TO GET THE PS
 2895  015036  104400                         TRAP
 2896  015040  005726              1$:        TST     (SP)+           ;;CLEAN OFF THE USED PC
 2897  015042  012666  000002                 MOV     (SP)+,2(SP)     ;;SAVE OFF THE PS
 2898  015046  012637  000034                 MOV     (SP)+,@#34      ;;RESTORE TRAP VECTOR
 2899  015052  042716  000020                 BIC     #20,(SP)        ;;CLEAR THE "T" BIT
 2900  015056  032777  010000  164052         BIT     #BIT12,@SWR     ;; RUN WITH TRACE TRAP?
 2901  015064  001005                         BNE     2$              ;;BR IF NO
 2902  015066  005137  015112                 COM     $TBIT           ;;IS IT TIME FOR TRACE TRAP
 2903  015072  100402                         BMI     2$              ;;BR IF NO
 2904  015074  052716  000020                 BIS     #20,(SP)        ;;SET TRACE TRAP
 2905  015100  012746  015106              2$:MOV     #$LOOP,-(SP)    ;;JUMP TO START OF TEST
 2906  015104  000002              $RTRN:     RTI                     ;;RETURN--THIS IS CHANGED TO
 2907                                                                 ;;AN "RTT" IF "RTT" IS LEGAL
 2908                                                                 ;;INSTRUCTION
 2909  015106                              $LOOP:
 2910  015106  000137  015134                 JMP     @#HOOK1         ;;RETURN
 2911  015112  000000              $TBIT:     0
 2912  015114  005015  047105  020104 $ENDMG: .ASCIZ   <15><12>/END PASS #/
 2913  015122  040520  051523  021440
 2914  015130     000
 2915  015131     377     377     000 $ENULL: .BYTE   -1,-1,0         ;;NULL CHARACTER STRING
 2916
```

```
2917  015134  032777  000040  163774  HOOK1:  BIT     #40,@SWR            ;CHECK @SWR FOR HALT AT END OF DECK
2918  015142  001402                  BEQ     ONLINE              ;CONTINUE IF NOT SET
2919  015144  000000                  HALT                        ;END OF DECK,SWS SET
2920  015146  000427                  BR      DECKCK
2921
2922  015150  032713  010000          ONLINE: BIT     #10000, @CDS    ;CHECK FOR OFF-LINE
2923  015154  001424                  BEQ     DECKCK              ;BRANCH IF NOT
2924  015156  005713                  TST     @CDS                ;CHECK FOR ERROR (BIT 15)
2925  015160  100401                  BMI     1$                  ;BRANCH IF SET OK
2926  015162  104026                  ERROR +26                   ;ERROR BIT 15 NOT SET
2927
2928  015164  032713  040000          1$:     BIT     #40000, @CDS    ;CHECK FOR CARD READER ERROR
2929  015170  001001                  BNE     2$                  ;BRANCH IF SET OK
2930  015172  104035                  ERROR +35                   ;OFF-LINE NOT DUE TO CARD READER ERROR
2931
2932  015174  032713  023471          2$:     BIT     #023471,@CDS    ;CHECK FOR EXTRA BITS SET
2933  015200  001401                  BEQ     3$                  ;BRANCH IF OK
2934  015202  104015                  ERROR +15                   ;EXTRA ERROR BITS SET
2935
2936  015204  012712  015214          3$:     MOV     #ONINT, @#ADINT ;SET UP INTERRUPT VECTOR
2937  015210  000001                  4$:     WAIT                    ;WAIT FOR AN INTERRUPT
2938  015212  000776                  BR      4$                  ;WAIT ON TRACE TRAPS
2939
2940  015214  032713  000010          ONINT:  BIT     #10,    @CDS    ;CHECK FOR TRANSITION TO ON LINE
2941  015220  001001                  BNE     1$                  ;BRANCH IF SET OK
2942  015222  104036                  ERROR +36                   ;INTERRUPT BY OTHER THAN BIT 3 SETTING
2943
2944  015224  022626                  1$:     CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
2945                                  ;WHEN CONTINUING FROM ONE DECK TO ANOTHER, CHECK SW6 FOR TYPE
2946                                  ;OF TESTING TO BE PERFORMED
2947  015226  005137  001254          DECKCK: COM     TRFLG           ;TOGGLE TRACE FLAG
2948  015232  032777  000100  163676          BIT     #100,@SWR               ;CHECK SW6
2949  015240  001402                  BEQ     1$                  ;BRANCH IF NOT SET
2950  015242  000137  002504          JMP     RESTRT              ;RERUN COMBINED INSTRUCTION AND DATA TEST
2951  015246  000137  012260          1$:     JMP     DATST
2952
2953  015252  022626                  DATRST: CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
2954  015254  000137  012260                  JMP     DATST           ;RESTART DATA TEST
2955
2956  015260  177660                  SIZE:   -120
2957  015262  177660                  OFFSET: -120
2958  015264  000000                  BUFEND: 0
2959  015266  000000                  TEMP1:  0
2960  015270  000000                  TEMP2:  0
2961  015272  000000                  TSTART: 0                   ;STARTING ADDRESS OF DATA TABLE
2962  015274  000000                  TEND:   0                   ;END ADDRESS OF DATA TABLE
2963  015276  000000                  CDCNT:  0                   ;NUMBER OF CARD BEING READ
2964  015300  000000                  CLCNT:  0                   ;NUMBER OF COLUMN BEING CHECKED
2965  015302  000000                  PTOFF:  0                   ;OFFSET TO POINTER FOR DATA PRINTOUT
2966  015304  000000                  DERCNT: 0                   ;DATA ERROR COLUMN COUNT
```

```
                                        ;SETUP FOR ERROR FUNCTION TEST
015306                                  ER1200:
015306  012706  001100                          MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
015312  005026                                  CLR     (R6)+           ;;CLEAR MEMORY LOCATION
015314  022706  001126                          CMP     #$BDDAT,R6      ;;DONE?
015320  001374                                  BNE     .-6             ;;LOOP BACK IF NO
015322  012706  001100                          MOV     #STACK,SP       ;;SETUP THE STACK POINTER
015326  012737  026024  000020                  MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
015334  012737  000340  000022                  MOV     #340,@#IOTVEC+2 ;;LEVEL 7
015342  012737  025650  000030                  MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
015350  012737  000340  000032                  MOV     #340,@#EMTVEC+2 ;;LEVEL 7
015356  012737  027072  000034                  MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
015364  012737  000340  000036                  MOV     #340,@#TRAPVEC+2;LEVEL 7
015372  012737  027126  000024                  MOV     #$PWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
015400  012737  000340  000026                  MOV     #340,@#PWRVEC+2 ;;LEVEL 7
015406  013737  014740  014732                  MOV     $ENDCT,$EOPCT   ;;SETUP END-OF-PROGRAM COUNTER
015414  005037  001220                          CLR     $TIMES          ;;INITIALIZE NUMBER OF ITERATIONS
015420  012737  015104  000014                  MOV     #$RTRN,@#TBITVEC ;;SET "T" BIT VECTOR TO $RTRN
015426  012737  000340  000016                  MOV     #340,@#TBITVEC+2 ;;LEVEL 7
015434  012737  000002  015104                  MOV     #RTI,$RTRN      ;;SET $RTRN TO A RTI
015442  012737  015470  000010                  MOV     #65$,@#RESVEC   ;;TRY TO DO A RTT
015450  005046                                  CLR     -(SP)           ;;DUMMY PS
015452  012746  015460                          MOV     #64$,-(SP)      ;;AND PC
015456  000006                                  RTT                     ;;TRY THE RTT
015460  012737  000006  015104  64$:            MOV     #RTT,$RTRN      ;;RTT IS LEGAL--SET $RTRN TO A RTT
015466  000402                                  BR      66$
015470  062706  000010          65$:            ADD     #10,SP          ;;RTT ILLEGAL--CLEAN OFF THE STACK
015474  012737  000012  000010  66$:            MOV     #RESVEC+2,@#RESVEC ;;RESTORE TRAP CATCHER
015502  005037  015112                          CLR     $TBIT           ;;CLEAR "T" BIT SWITCH
015506  012737  015506  001106                  MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
015514  013746  000004                          MOV     @#4,-(SP)       ;;SAVE ERROR VECTOR
015520  013746  000006                          MOV     @#6,-(SP)
015524  012737  015540  000004                  MOV     #67$,4          ;;SET UP TIME OUT VECTOR
015532  005777  163400                          TST     @SWR            ;;TRY TO REFERENCE HARDWARE SWR
015536  000407                                  BR      68$             ;;BRANCH IF NO TIMEOUT TRAP OCCURS
015540  012737  000176  001136  67$:            MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
015546  012737  000174  001140                  MOV     #DISPREG,DISPLAY ;;POINT TO SOFTWARE DISPLAY REG
015554  022626                                  CMP     (SP)+,(SP)+     ;;RESTORE STACK
015556  012637  000006          68$:            MOV     (SP)+,@#6       ;;RESTORE ERROR VECTOR
015562  012637  000004                          MOV     (SP)+,@#4
015566  104400  031031                          TYPE,   M1200E          ;INDICATE "ENTERING ERROR FUNCTION
                                                                        ;TESTING OF AN M-1200"
015572  005037  001266                          CLR     CD1000          ;CARD READER IS M-1200
015576  000137  016074                          JMP     ER12CD
015602                                  ERCD11:
015602  012706  001100                          MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
015606  005026                                  CLR     (R6)+           ;;CLEAR MEMORY LOCATION
015610  022706  001126                          CMP     #$BDDAT,R6      ;;DONE?
015614  001374                                  BNE     .-6             ;;LOOP BACK IF NO
015616  012706  001100                          MOV     #STACK,SP       ;;SETUP THE STACK POINTER
015622  012737  026024  000020                  MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
015630  012737  000340  000022                  MOV     #340,@#IOTVEC+2 ;;LEVEL 7
015636  012737  025650  000030                  MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
```

```
3021  015644  012737  000340  000032          MOV     #340,@#EMTVEC+2 ;;LEVEL 7
3022  015652  012737  027072  000034          MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
3023  015660  012737  000340  000036          MOV     #340,@#TRAPVEC+2;LEVEL 7
3024  015666  012737  027126  000024          MOV     #$PWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
3025  015674  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;LEVEL 7
3026  015702  013737  014740  014732          MOV     $ENDCI,$EOPCT   ;;SETUP END-OF-PROGRAM COUNTER
3027  015710  005037  001220                  CLR     $TIMES          ;;INITIALIZE NUMBER OF ITERATIONS
3028  015714  012737  015104  000014          MOV     #$RTRN,@#TBITVEC ;;SET "T" BIT VECTOR TO $RTRN
3029  015722  012737  000340  000016          MOV     #340,@#TBITVEC+2 ;;LEVEL 7
3030  015730  012737  000002  015104          MOV     #RTI,$RTRN      ;;SET $RTRN TO A RTI
3031  015736  012737  015764  000010          MOV     #65$,@#RESVEC   ;;TRY TO DO A RTT
3032  015744  005046                          CLR     -(SP)           ;;DUMMY PS
3033  015746  012746  015754                  MOV     #64$,-(SP)      ;;AND PC
3034  015752  000006                          RTT                     ;;TRY THE RTT
3035  015754  012737  000006  015104  64$:    MOV     #RTT,$RTRN      ;;RTT IS LEGAL--SET $RTRN TO A RTT
3036  015762  000402                          BR      66$
3037  015764  062706  000010          65$:    ADD     #10,SP          ;;RTT ILLEGAL--CLEAN OFF THE STACK
3038  015770  012737  000012  000010  66$:    MOV     #RESVEC+2,@#RESVEC ;;RESTORE TRAP CATCHER
3039  015776  005037  015112                  CLR     $TBIT           ;;CLEAR "T" BIT SWITCH
3040  016002  012737  016002  001106          MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
3041  016010  013746  000004                  MOV     @#4,-(SP)       ;;SAVE ERROR VECTOR
3042  016014  013746  000006                  MOV     @#6,-(SP)
3043  016020  012737  016034  000004          MOV     #67$,4          ;;SET UP TIME OUT VECTOR
3044  016026  005777  163104                  TST     @SWR            ;;TRY TO REFERENCE HARDWARE SWR
3045  016032  000407                          BR      68$             ;;BRANCH IF NO TIMEOUT TRAP OCCURS
3046  016034  012737  000176  001136  67$:    MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
3047  016042  012737  000174  001140          MOV     #DISPREG,DISPLAY ;;POINT TO SOFTWARE DISPLAY REG
3048  016050  022626                          CMP     (SP)+,(SP)+     ;;RESTORE STACK
3049  016052  012637  000006          68$:    MOV     (SP)+,@#6       ;;RESTORE ERROR VECTOR
3050  016056  012637  000004                  MOV     (SP)+,@#4
3051  016062  104400  031077                  TYPE,   M1000E          ;INDICATE "ENTERING ERROR FUNCTION
3052                                                                  ;TESTING OF AN M1000/M200"
3053  016066  012737  177777  001266          MOV     #177777, CD1000 ;CARD READER IS M1000/M200
3054  016074  012737  016106  027274  ER12CD: MOV     #ERCD12,RETURN  ;SAVE RETURN POINT FOR THIS
3055                                                                  ;SECTION FOR POWER FAILURE RETURN
3056  016102  004737  043712                  JSR     PC,SETUP        ;INITIALIZE REGISTERS
3057  016106  104400  030254          ERCD12: TYPE,   $TMES   ;TYPE MAINDEC TITLE & REV. LEVEL
3058
3059                                  ;*****************************************************************
3060                                  ;*TEST 33       TEST DATA LATE
3061                                  ;*****************************************************************
3062  016112  000004                  TST33:  SCOPE
3063                                  ;HALT SHOULD CAUSE DATA LATE ERROR (BIT 10)
3064                                  ;SHOULD SET ERROR (BIT 15)
3065  016114  004737  025442                  JSR     PC,     INIT    ;INITIALIZE STATUS REGISTER
3066  016120  104400  030251                  TYPE,   CRLF
3067  016124  104400  033535                  TYPE,   MSG22           ;"WHEN PRINTING STOPS PUT HALT AND
3068                                                                  ;SINGLE BUS CYCLE DOWN, AND HIT 'CONTINUE' ON THE
3069                                                                  ;CONSOLE UNTIL ONE CARD IS READ
3070                                                                  ;THEN PUT UP THE TWO SWITCHES AND HIT
3071                                                                  ;'CONTINUE' ON THE CONSOLE
3072  016130  104400  030246                  TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
3073  016134  012714  177701                  MOV     #-77,   @CDC    ;SET UP COLUMN COUNT
3074  016140  012715  043766                  MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
```

```
3075  016144  000000                    HALT                    ;
3076  016146  005213                    INC     @CDS            ;START READING
3077  016150  105713                    TSTB    @CDS            ;CHECK FOR CONTROLLER READY
3078  016152  001001                    BNE     1$              ;BRANCH IF SET OK
3079  016154  104023                    ERROR +23               ;CONTROLLER READY FAILED TO SET
3080
3081  016156  005713            1$:     TST     @CDS            ;CHECK FOR ERROR ( BIT 15)
3082  016160  001001                    BNE     2$              ;BRANCH IF SET OK
3083  016162  104026                    ERROR +26               ;ERROR BIT 15 NOT SET
3084
3085  016164  032713  002000    2$:     BIT     #2000,  @CDS    ;CHECK FOR DATA LATE ERROR (BIT 10)
3086  016170  001001                    BNE     3$              ;BRANCH IF SET OK
3087  016172  104042                    ERROR +42               ;DATA LATE BIT 10 NOT SET
3088
3089  016174  032713  075577    3$:     BIT     #075577,@CDS    ;CHECK FOR ANY OTHER BITS
3090  016200  001401                    BEQ     4$              ;BRANCH IF OK
3091  016202  104004                    ERROR +4                ;EXTRA BITS SET IN STATUS WORD
3092
3093  016204                    4$:
3094                            ;*****************************************************************
3095                            ;*TEST 34       TEST ERROR AND OFF LINE BITS
3096                            ;*****************************************************************
3097  016204  000004            TST34:  SCOPE
3098                            ;THE CARD READER GOING OFF-LINE SHOULD SET ERROR (BIT 15)
3099                            ;AND OFF-LINE (BIT 12)
3100                            ;GOING BACK ON LINE SHOULD SET "TRANSITION TO ON-LINE" (BIT 3)
3101  016206  004737  025442            JSR     PC,INIT         ;INITIALIZE STATUS REGISTER
3102  016212  104400  031375            TYPE,   MSG3            ;"PRESS CARD READER 'STOP'"
3103  016216  104400  031330            TYPE,   MSG2            ;"THEN HIT 'CONTINUE' ON THE CONSOLE"
3104  016222  104400  030246            TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
3105  016226  000000                    HALT
3106  016230  032713  010000            BIT     #10000,@CDS     ;CHECK BIT 12
3107  016234  001001                    BNE     1$              ;BRANCH IF SET
3108  016236  104043                    ERROR +43               ;OFF-LINE (BIT 12) WASN'T SET
3109
3110  016240  005713            1$:     TST     @CDS            ;CHECK BIT 15
3111  016242  100401                    BMI     2$              ;BRANCH IF SET
3112  016244  104026                    ERROR +26               ;ERROR (BIT 15) WASN'T SET
3113
3114  016246  031327  067577    2$:     BIT     @CDS,#067577    ;CHECK FOR EXTRA BITS
3115  016252  001401                    BEQ     3$              ;BRANCH IF OK
3116  016254  104015                    ERROR +15               ;STATUS WORD ERROR
3117
3118  016256  104400  031274    3$:     TYPE,   MSG1            ;"PRESS CARD READER 'RESET'";
3119  016262  104400  031330            TYPE,   MSG2            ;"THEN HIT 'CONTINUE' ON THE CONSOLE"
3120  016266  104400  030246            TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
3121  016272  000000                    HALT
3122
3123  016274  032713  000010            BIT     #10,    @CDS    ;CHECK FOR TRANSIION TO ON-LINE(BIT 3)
3124  016300  001001                    BNE     4$              ;BRANCH IF SET OK
3125  016302  104036                    ERROR +36               ;TRANSITION TO ON-LINE FAILED TO SET
3126
3127  016304  032713  010000    4$:     BIT     #10000, @CDS    ;CHECK FOR OFF-LINE
3128  016310  001401                    BEQ     5$              ;BRANCH IF OK
```

```
3129  016312  104044                          ERROR +44                       ;OFF-LINE STILL SET
3130
3131  016314  005713                  5$:     TST     @CDS                    ;CHECK ERROR (BIT 15)
3132  016316  100401                          BMI     6$                      ;BRANCH IF STILL SET
3133  016320  104026                          ERROR +26                       ;ERROR BIT 15 CLEARED
3134
3135  016322  032713  077567          6$:     BIT     #077567,@CDS           ;CHECK FOR EXTRA BITS
3136  016326  001401                          BEQ     7$                      ;BRANCH IF OK
3137  016330  104015                          ERROR +15                       ;EXTRA STATUS BITS SET
3138
3139  016332                          7$:
3140                                          ;*****************************************************************
3141  016332  000004                  TST35:  SCOPE
3142                                          ;TRYING TO READ WHEN CARD READER IS OFF-LINE SHOULD CAUSE AN INTERRUPT
3143                                          ;CHECK THAT AN INTERRUPT OCCURS WHEN THE CARD READER COMES ON LINE
3144  016334  004737  025442                  JSR     PC,INIT                 ;INITIALIZE STATUS REGISTER
3145  016340  012712  016576                  MOV     #TINTC,@ADINT           ;LOAD RETURN POINTER
3146                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
3147  016344  005046                          CLR     -(SP)                   ;;
3148  016346  013746  000034                  MOV     34,-(SP)                ;;SAVE CURRENT TRAP VECTOR
3149  016352  012737  016362  000034          MOV     #64$,34                 ;;SETUP NEW TRAP VECTOT
3150  016360  104400                          TRAP                            ;;PUSH OLD PSW AN PCON STACK
3151  016362  016666  000002  000006  64$:    MOV     2(SP),6(SP)             ;;
3152  016370  012716  016376                  MOV     #65$,(SP)                       ;;REPLACE OLD PC WITH NEW
3153  016374  000002                          RTI                             ;;RESTORE PSW
3154  016376  012637  000034          65$:    MOV     (SP)+,34                        ;;RESTORE OLD TRAP  VECTOR
3155  016402  012637  001214                  MOV     (SP)+,$TMP6
3156  016406  052737  000340  001214          BIS     #340,$TMP6
3157  016414  013746  001214                  MOV     $TMP6,-(SP)             ;;PUT NEW PS ON STACK
3158  016420  012746  016426                  MOV     #66$,-(SP)              ;;PUT NEW PC ON  STACK
3159  016424  000002                          RTI                             ;; POP NEW PC AND PS
3160  016426                          66$:
3161                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
3162  016426  005046                          CLR     -(SP)                   ;;
3163  016430  013746  000034                  MOV     34,-(SP)                ;;SAVE CURRENT TRAP VECTOR
3164  016434  012737  016444  000034          MOV     #67$,34                 ;;SETUP NEW TRAP VECTOT
3165  016442  104400                          TRAP                            ;;PUSH OLD PSW AN PCON STACK
3166  016444  016666  000002  000006  67$:    MOV     2(SP),6(SP)             ;;
3167  016452  012716  016460                  MOV     #68$,(SP)                       ;;REPLACE OLD PC WITH NEW
3168  016456  000002                          RTI                             ;;RESTORE PSW
3169  016460  012637  000034          68$:    MOV     (SP)+,34                        ;;RESTORE OLD TRAP  VECTOR
3170  016464  012662  000002                  MOV     (SP)+,2(ADINT)
3171                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
3172  016470  005046                          CLR     -(SP)                   ;;
3173  016472  013746  000034                  MOV     34,-(SP)                ;;SAVE CURRENT TRAP VECTOR
3174  016476  012737  016506  000034          MOV     #69$,34                 ;;SETUP NEW TRAP VECTOT
3175  016504  104400                          TRAP                            ;;PUSH OLD PSW AN PCON STACK
3176  016506  016666  000002  000006  69$:    MOV     2(SP),6(SP)             ;;
3177  016514  012716  016522                  MOV     #70$,(SP)                       ;;REPLACE OLD PC WITH NEW
3178  016520  000002                          RTI                             ;;RESTORE PSW
3179  016522  012637  000034          70$:    MOV     (SP)+,34                        ;;RESTORE OLD TRAP  VECTOR
3180  016526  012637  001214                  MOV     (SP)+,$TMP6
3181  016532  042737  000340  001214          BIC     #340,$TMP6
3182  016540  013746  001214                  MOV     $TMP6,-(SP)             ;;PUT NEW PS ON STACK
```

```
3183  016544  012746  016552                MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
3184  016550  000002                       RTI                     ;; POP NEW PC AND PS
3185  016552                        71$:
3186  016552  012713  000100                MOV     #100,   @CDS    ;SET INTERRUPT ENABLE
3187  016556  104400  031375                TYPE,   MSG3            ;"PRESS CARD READER 'STOP'"
3188  016562  104400  030246                TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
3189  016566  032713  010000        TLOPC:  BIT     #10000, @CDS    ;WAIT FOR OFF-LINE TO SET
3190  016572  001775                       BEQ     TLOPC
3191  016574  000402                       BR      CONTC           ;SKIP INTERRUPT HANDLER
3192
3193  016576  104021                TINTC:  ERROR +21                       ;'STOP' SHOULDN'T CAUSE AN INTERRUPT
3194  016600  000002                       RTI                     ;RETURN FROM THE INTERRUPT
3195
3196  016602  105713                CONTC:  TSTB    @CDS            ;CHECK CONTROLLER READY BIT 7
3197  016604  100401                       BMI     1$              ;BRANCH IF OK
3198  016606  104023                       ERROR +23                       ;CU READY DIDN'T SET YET
3199
3200  016610  005713                1$:     TST     @CDS            ;CHECK ERROR BIT
3201  016612  100401                       BMI     2$              ;BRANCH IF SET
3202  016614  104026                       ERROR +26                       ;ERROR (BIT 15) NOT SET
3203
3204  016616  032713  067477        2$:     BIT     #067477,@CDS   ;CHECK FOR EXTRA BITS
3205  016622  001401                       BEQ     3$              ;BRANCH IF OK
3206  016624  104004                       ERROR +4                        ;STATUS WORD ERROR
3207
3208  016626  012712  017044        3$:     MOV     #TINTCA,@ADINT  ;LOAD RETURN POINTER
3209                                        ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
3210  016632  005046                       CLR     -(SP)           ;;
3211  016634  013746  000034               MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3212  016640  012737  016650  000034       MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
3213  016646  104400                       TRAP                    ;;PUSH OLD PSW AN PCON STACK
3214  016650  016666  000002  000006  64$:  MOV     2(SP),6(SP)     ;;
3215  016656  012716  016664               MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
3216  016662  000002                       RTI                     ;;RESTORE PSW
3217  016664  012637  000034          65$:  MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3218  016670  012637  001214               MOV     (SP)+,$TMP6
3219  016674  052737  000340  001214       BIS     #340,$TMP6
3220  016702  013746  001214               MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3221  016706  012746  016714               MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
3222  016712  000002                       RTI                     ;; POP NEW PC AND PS
3223  016714                          66$:
3224                                        ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
3225  016714  005046                       CLR     -(SP)           ;;
3226  016716  013746  000034               MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3227  016722  012737  016732  000034       MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
3228  016730  104400                       TRAP                    ;;PUSH OLD PSW AN PCON STACK
3229  016732  016666  000002  000006  67$:  MOV     2(SP),6(SP)     ;;
3230  016740  012716  016746               MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
3231  016744  000002                       RTI                     ;;RESTORE PSW
3232  016746  012637  000034          68$:  MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3233  016752  012662  000002               MOV     (SP)+,2(ADINT)
3234                                        ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
3235  016756  005046                       CLR     -(SP)           ;;
3236  016760  013746  000034               MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
```

```
3237  016764  012737  016774  000034          MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
3238  016772  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
3239  016774  016666  000002  000006  69$:    MOV     2(SP),6(SP)     ;;
3240  017002  012716  017010                  MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
3241  017006  000002                          RTI                     ;;RESTORE PSW
3242  017010  012637  000034          70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3243  017014  012637  001214                  MOV     (SP)+,$TMP6
3244  017020  042737  000340  001214          BIC     #340,$TMP6
3245  017026  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3246  017032  012746  017040                  MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
3247  017036  000002                          RTI                     ;; POP NEW PC AND PS
3248  017040                          71$:
3249  017040  005213                          INC     @CDS            ;TRY TO READ A CARD
3250  017042  000777                          BR      .               ;WAIT FOR THE INTERRUPT
3251
3252  017044  022626                  TINTCA: CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
3253  017046  105713                          TSTB    @CDS            ;CHECK CONTROLLER READY BIT 7
3254  017050  100401                          BMI     1$              ;BRANCH IF OK
3255  017052  104023                          ERROR +23                       ;CU READY DIDN'T SET YET
3256
3257  017054  032713  010000          1$:     BIT     #10000, @CDS    ;CHECK FOR OFF-LINE BIT 12
3258  017060  001001                          BNE     2$              ;BRANCH IF OK
3259  017062  104043                          ERROR +43                       ;OFF-LINE BIT 12 NOT SET
3260
3261  017064  005713                  2$:     TST     @CDS            ;CHECK ERROR BIT
3262  017066  100401                          BMI     3$              ;BRANCH IF SET
3263  017070  104026                          ERROR +26                       ;ERROR (BIT 15) NOT SET
3264
3265  017072  032713  067477          3$:     BIT     #067477,@CDS   ;CHECK FOR EXTRA BITS
3266  017076  001401                          BEQ     4$              ;BRANCH IF OK
3267  017100  104004                          ERROR +4                        ;STATUS WORD ERROR
3268
3269  017102  012712  017326          4$:     MOV     #TINTCB,@ADINT  ;LOAD RETURN POINTER
3270                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
3271  017106  005046                          CLR     -(SP)           ;;
3272  017110  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3273  017114  012737  017124  000034          MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
3274  017122  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
3275  017124  016666  000002  000006  64$:    MOV     2(SP),6(SP)     ;;
3276  017132  012716  017140                  MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
3277  017136  000002                          RTI                     ;;RESTORE PSW
3278  017140  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3279  017144  012637  001214                  MOV     (SP)+,$TMP6
3280  017150  052737  000340  001214          BIS     #340,$TMP6
3281  017156  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3282  017162  012746  017170                  MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
3283  017166  000002                          RTI                     ;; POP NEW PC AND PS
3284  017170                          66$:
3285                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
3286  017170  005046                          CLR     -(SP)           ;;
3287  017172  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3288  017176  012737  017206  000034          MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
3289  017204  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
3290  017206  016666  000002  000006  67$:    MOV     2(SP),6(SP)     ;;
```

```
3291  017214  012716  017222                MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
3292  017220  000002                        RTI                             ;;RESTORE PSW
3293  017222  012637  000034        68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3294  017226  012662  000002                MOV     (SP)+,2(ADINT)
3295                                        ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
3296  017232  005046                        CLR     -(SP)                   ;;
3297  017234  013746  000034                MOV     34,-(SP)                ;;SAVE CURRENT TRAP VECTOR
3298  017240  012737  017250  000034        MOV     #69$,34                 ;;SETUP NEW TRAP VECTOT
3299  017246  104400                        TRAP                            ;;PUSH OLD PSW AN PCON STACK
3300  017250  016666  000002  000006  69$:  MOV     2(SP),6(SP)             ;;
3301  017256  012716  017264                MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
3302  017262  000002                        RTI                             ;;RESTORE PSW
3303  017264  012637  000034        70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3304  017270  012637  001214                MOV     (SP)+,$TMP6
3305  017274  042737  000340  001214        BIC     #340,$TMP6
3306  017302  013746  001214                MOV     $TMP6,-(SP)             ;;PUT NEW PS ON STACK
3307  017306  012746  017314                MOV     #71$,-(SP)              ;;PUT NEW PC ON  STACK
3308  017312  000002                        RTI                             ;; POP NEW PC AND PS
3309  017314                        71$:
3310  017314  104400  031274                TYPE,   MSG1                    ;"PRESS CARD READER 'RESET'"
3311  017320  104400  030246                TYPE,   CRLF-3                  ;MOVE MESSAGE UP ON TTY
3312  017324  000777                        BR      .                       ;WAIT FOR THE INTERRUPT
3313
3314  017326  022626                TINTCB: CMP     (SP)+,  (SP)+           ;RESTORE THE STACK
3315  017330  032713  000010                BIT     #10,    @CDS            ;CHECK FOR TRANSITION TO ON-LINE(BIT 3)
3316  017334  001001                        BNE     1$                      ;BRANCH IF SET OK
3317  017336  104036                        ERROR +36                       ;TRANSITION TO ON-LINE FAILED TO SET
3318
3319  017340  032713  010000        1$:     BIT     #10000, @CDS            ;CHECK FOR OFF-LINE
3320  017344  001401                        BEQ     2$                      ;BRANCH IF OK
3321  017346  104044                        ERROR +44                       ;OFF-LINE STILL SET
3322
3323  017350  005713                2$:     TST     @CDS                    ;CHECK ERROR (BIT 15)
3324  017352  100401                        BMI     3$                      ;BRANCH IF STILL SET
3325  017354  104026                        ERROR +26                       ;ERROR BIT 15 CLEARED
3326
3327  017356  032713  077467        3$:     BIT     #077467,@CDS            ;CHECK FOR EXTRA BITS
3328  017362  001401                        BEQ     4$                      ;BRANCH IF OK
3329  017364  104015                        ERROR +15                       ;EXTRA STATUS BITS SET
3330
3331  017366                        4$:
3332                                        ;*************************************************************
3333                                        ;*TEST 36       TEST INPUT HOPPER EMPTY
3334                                        ;*************************************************      ******
3335  017366  000004                TST36:  SCOPE
3336                                        ;INPUT HOPPER EMPTY SHOULD SET SPECIAL CONDITION
3337                                        ;CHECK THAT INTERRUPTS OCCUR WHEN THE CARD READER COMES ON LINE
3338  017370  004737  025442                JSR     PC,INIT                 ;INITIALIZE STATUS REGISTER
3339  017374  104400  031463                TYPE,   MSG5                    ;"REMOVE ALL CARDS FROM THE INPUT HOPPER"
3340  017400  104400  031330                TYPE,   MSG2                    ;"THEN HIT 'CONTINUE' ON THE CONSOLE"
3341  017404  104400  030246                TYPE,   CRLF-3                  ;MOVE MESSAGE UP ON TTY
3342  017410  000000                        HALT
3343  017412  032713  010000                BIT     #10000,@CDS             ;CHECK BIT12
3344  017416  001001                        BNE     1$                      ;BRANCH IF SET
```

```
3345  017420  104043                          ERROR +43                       ;OFF-LINE (BIT 12) WASN'T SET
3346
3347  017422  005713                  1$:     TST     @CDS            ;CHECK ERROR BIT
3348  017424  100401                          BMI     2$              ;BRANCH IF SET
3349  017426  104026                          ERROR +26                       ;ERROR (BIT 15) NOT SET
3350
3351  017430  032713  040000          2$:     BIT     #40000, @CDS    ;CHECK FOR CARD READER ERROR
3352  017434  001001                          BNE     3$              ;BRANCH IF SET
3353  017436  104035                          ERROR +35                       ;CARD READER ERROR BIT 14 NOT SET
3354
3355  017440  032713  027573          3$:     BIT     #027573,@CDS   ;CHECK FOR EXTRA BITS
3356  017444  001401                          BEQ     4$              ;BRANCH IF OK
3357  017446  104015                          ERROR +15                       ;STATUS WORD ERROR
3358
3359  017450  012712  017704          4$:     MOV     #TINTD, @#DINT  ;LOAD RETURN POINTER
3360                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
3361  017454  005046                          CLR     -(SP)           ;;
3362  017456  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3363  017462  012737  017472  000034          MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
3364  017470  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
3365  017472  016666  000002  000006  64$:    MOV     2(SP),6(SP)     ;;
3366  017500  012716  017506                  MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
3367  017504  000002                          RTI                     ;;RESTORE PSW
3368  017506  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3369  017512  012637  001214                  MOV     (SP)+,$TMP6
3370  017516  052737  000340  001214          BIS     #340,$TMP6
3371  017524  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3372  017530  012746  017536                  MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
3373  017534  000002                          RTI                     ;; POP NEW PC AND PS
3374  017536                          66$:
3375                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
3376  017536  005046                          CLR     -(SP)           ;;
3377  017540  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3378  017544  012737  017554  000034          MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
3379  017552  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
3380  017554  016666  000002  000006  67$:    MOV     2(SP),6(SP)     ;;
3381  017562  012716  017570                  MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
3382  017566  000002                          RTI                     ;;RESTORE PSW
3383  017570  012637  000034          68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3384  017574  012662  000002                  MOV     (SP)+,2(ADINT)
3385                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
3386  017600  005046                          CLR     -(SP)           ;;
3387  017602  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3388  017606  012737  017616  000034          MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
3389  017614  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
3390  017616  016666  000002  000006  69$:    MOV     2(SP),6(SP)     ;;
3391  017624  012716  017632                  MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
3392  017630  000002                          RTI                     ;;RESTORE PSW
3393  017632  012637  000034          70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3394  017636  012637  001214                  MOV     (SP)+,$TMP6
3395  017642  042737  000340  001214          BIC     #340,$TMP6
3396  017650  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3397  017654  012746  017662                  MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
3398  017660  000002                          RTI                     ;; POP NEW PC AND PS
```

```
3399  017662                                  71$:
3400  017662  012713  000100                          MOV     #100,   @CDS    ;SET INTERRUPT ENABLE
3401  017666  104400  031534                          TYPE,   MSG6            ;"RESTORE CARDS TO THE INPUT HOPPER"
3402  017672  104400  031274                          TYPE,   MSG1            ;"PRESS CARD READER 'RESET'"
3403  017676  104400  030246                          TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
3404  017702  000777                                  BR      .               ;WAIT FOR THE INTERRUPT
3405
3406  017704  022626                          TINTD:  CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
3407  017706  012712  020134                          MOV     #TINTDA,@ADINT  ;LOAD RETURN POINTER
3408                                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
3409  017712  005046                                  CLR     -(SP)           ;;
3410  017714  013746  000034                          MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3411  017720  012737  017730  000034                  MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
3412  017726  104400                                  TRAP                    ;;PUSH OLD PSW AN PCON STACK
3413  017730  016666  000002  000006  64$:   MOV     2(SP),6(SP)     ;;
3414  017736  012716  017744                          MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
3415  017742  000002                                  RTI                     ;;RESTORE PSW
3416  017744  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3417  017750  012637  001214                          MOV     (SP)+,$TMP6
3418  017754  052737  000340  001214                  BIS     #340,$TMP6
3419  017762  013746  001214                          MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3420  017766  012746  017774                          MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
3421  017772  000002                                  RTI                     ;; POP NEW PC AND PS
3422  017774                                  66$:
3423                                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
3424  017774  005046                                  CLR     -(SP)           ;;
3425  017776  013746  000034                          MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3426  020002  012737  020012  000034                  MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
3427  020010  104400                                  TRAP                    ;;PUSH OLD PSW AN PCON STACK
3428  020012  016666  000002  000006  67$:   MOV     2(SP),6(SP)     ;;
3429  020020  012716  020026                          MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
3430  020024  000002                                  RTI                     ;;RESTORE PSW
3431  020026  012637  000034          68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3432  020032  012662  000002                          MOV     (SP)+,2(ADINT)
3433                                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
3434  020036  005046                                  CLR     -(SP)           ;;
3435  020040  013746  000034                          MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3436  020044  012737  020054  000034                  MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
3437  020052  104400                                  TRAP                    ;;PUSH OLD PSW AN PCON STACK
3438  020054  016666  000002  000006  69$:   MOV     2(SP),6(SP)     ;;
3439  020062  012716  020070                          MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
3440  020066  000002                                  RTI                     ;;RESTORE PSW
3441  020070  012637  000034          70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3442  020074  012637  001214                          MOV     (SP)+,$TMP6
3443  020100  042737  000340  001214                  BIC     #340,$TMP6
3444  020106  013746  001214                          MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3445  020112  012746  020120                          MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
3446  020116  000002                                  RTI                     ;; POP NEW PC AND PS
3447  020120                                  71$:
3448  020120  012714  177701                          MOV     #-77,   @CDC    ;SET UP COLUMN COUNT
3449  020124  012715  043766                          MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
3450  020130  005213                                  INC     @CDS            ;START READING
3451  020132  000777                                  BR      .               ;WAIT FOR AN INTERRUPT
3452
```

```
3453  020134  022626                  TINTDA: CMP     (SP)+, (SP)+    ;RESTORE THE STACK
3454  020136  022713  000300                  CMP     #000300,@CDS    ;CHECK THE CARD READER STATUS
3455  020142  001401                          BEQ     1$              ;BRANCH IF OK
3456  020144  104004                          ERROR +4                        ;CARD READER STATUS ERROR
3457
3458  020146                          1$:
3459                                  ;*****************************************************************
3460                                  ;*TEST 37       TEST OUTPUT STACKER FULL
3461                                  ;*****************************************************************
3462  020146  000004                  TST37:  SCOPE
3463                                  ;OUTPUT STACKER FULL SHOULD SET BITS 15, 14, 12, 7
3464  020150  004737  025442                  JSR     PC,INIT         ;INITIALIZE STATUS REGISTER
3465  020154  104400  031600                  TYPE,   MSG7            ;"PULL OUTPUT STACKER PRESSURE ARM
3466                                                                  ;ALL THE WAY DOWN"
3467  020160  104400  031330                  TYPE,   MSG2            ;"THEN HIT 'CONTINUE' ON THE CONSOLE"
3468  020164  104400  030246                  TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
3469  020170  000000                          HALT
3470  020172  032713  010000                  BIT     #10000,@CDS     ;CHECK OFF-LINE BIT12
3471  020176  001001                          BNE     1$              ;BRANCH IF SET
3472  020200  104043                          ERROR +43                       ;OFF-LINE (BIT 12) WASN'T SET
3473
3474  020202  005713                  1$.     TST     @CDS            ;CHECK ERROR BIT 15
3475  020204  100401                          BMI     2$              ;BRANCH IF SET
3476  020206  104026                          ERROR +26                       ;ERROR BIT 15 NOT SET
3477
3478  020210  032713  040000          2$:     BIT     #40000, @CDS    ;CHECK FOR CARD READER ERROR
3479  020214  001001                          BNE     3$              ;BRANCH IF SET
3480  020216  104035                          ERROR +35                       ;CARD READER ERROR BIT 14 NOT SET
3481
3482  020220  032713  027577          3$:     BIT     #027577,@CDS    ;CHECK FOR EXTRA BITS
3483  020224  001401                          BEQ     4$              ;BRANCH IF OK
3484  020226  104015                          ERROR +15                       ;STATUS WORD ERROR
3485
3486  020230  012712  020460          4$:     MOV     #TINTE, @ADINT  ;LOAD RETURN POINTER
3487                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
3488  020234  005046                          CLR     -(SP)           ;;
3489  020236  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3490  020242  012737  020252  000034          MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
3491  020250  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
3492  020252  016666  000002  000006  64$:    MOV     2(SP),6(SP)     ;;
3493  020260  012716  020266                  MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
3494  020264  000002                          RTI                     ;;RESTORE PSW
3495  020266  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3496  020272  012637  001214                  MOV     (SP)+,$TMP6
3497  020276  052737  000340  001214          BIS     #340,$TMP6
3498  020304  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3499  020310  012746  020316                  MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
3500  020314  000002                          RTI                     ;; POP NEW PC AND PS
3501  020316                          66$:
3502                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
3503  020316  005046                          CLR     -(SP)           ;;
3504  020320  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3505  020324  012737  020334  000034          MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
3506  020332  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
```

```
3507  020334  016666  000002  000006  67$:    MOV     2(SP),6(SP)     ;;
3508  020342  012716  020350                  MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
3509  020346  000002                          RTI                     ;;RESTORE PSW
3510  020350  012637  000034          68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3511  020354  012662  000002                  MOV     (SP)+,2(ADINT)
3512                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
3513  020360  005046                          CLR     -(SP)           ;;
3514  020362  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3515  020366  012737  020376  000034          MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
3516  020374  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
3517  020376  016666  000002  000006  69$:    MOV     2(SP),6(SP)     ;;
3518  020404  012716  020412                  MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
3519  020410  000002                          RTI                     ;;RESTORE PSW
3520  020412  012637  000034          70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3521  020416  012637  001214                  MOV     (SP)+,$TMP6
3522  020422  042737  000340  001214          BIC     #340,$TMP6
3523  020430  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3524  020434  012746  020442                  MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
3525  020440  000002                          RTI                     ;; POP NEW PC AND PS
3526  020442                          71$:
3527  020442  012713  000100                  MOV     #100,   @CDS    ;SET INTERRUPT ENABLE
3528  020446  104400  031274                  TYPE,   MSG1            ;"PRESS CARD READER 'RESET'"
3529  020452  104400  030246                  TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
3530  020456  000777                          BR      .               ;WAIT FOR THE INTERRUPT
3531
3532  020460  022626                  TINTE:  CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
3533  020462  012712  020710                  MOV     #TINTEA,@ADINT  ;LOAD RETURN POINTER
3534                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
3535  020466  005046                          CLR     -(SP)           ;;
3536  020470  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3537  020474  012737  020504  000034          MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
3538  020502  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
3539  020504  016666  000002  000006  64$:    MOV     2(SP),6(SP)     ;;
3540  020512  012716  020520                  MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
3541  020516  000002                          RTI                     ;;RESTORE PSW
3542  020520  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3543  020524  012637  001214                  MOV     (SP)+,$TMP6
3544  020530  052737  000340  001214          BIS     #340,$TMP6
3545  020536  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3546  020542  012746  020550                  MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
3547  020546  000002                          RTI                     ;; POP NEW PC AND PS
3548  020550                          66$:
3549                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
3550  020550  005046                          CLR     -(SP)           ;;
3551  020552  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3552  020556  012737  020566  000034          MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
3553  020564  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
3554  020566  016666  000002  000006  67$:    MOV     2(SP),6(SP)     ;;
3555  020574  012716  020602                  MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
3556  020600  000002                          RTI                     ;;RESTORE PSW
3557  020602  012637  000034          68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3558  020606  012662  000002                  MOV     (SP)+,2(ADINT)
3559                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
3560  020612  005046                          CLR     -(SP)           ;;
```

```
3561  020614  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3562  020620  012737  020630  000034          MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
3563  020626  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
3564  020630  016666  000002  000006  69$:    MOV     2(SP),6(SP)     ;;
3565  020636  012716  020644                  MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
3566  020642  000002                          RTI                     ;;RESTORE PSW
3567  020644  012637  000034          70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3568  020650  012637  001214                  MOV     (SP)+,$TMP6
3569  020654  042737  000340  001214          BIC     #340,$TMP6
3570  020662  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3571  020666  012746  020674                  MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
3572  020672  000002                          RTI                     ;; POP NEW PC AND PS
3573  020674                          71$:
3574  020674  012714  177701                  MOV     #-77,   @CDC    ;SET UP COLUMN COUNT
3575  020700  012715  043766                  MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
3576  020704  005213                          INC     @CDS            ;START READING
3577  020706  000777                          BR      .               ;WAIT FOR AN INTERRUPT
3578
3579  020710  022626                  TINTEA: CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
3580  020712  022713  000300                  CMP     #000300,@CDS    ;CHECH THE CARD READER STATUS
3581  020716  001401                          BEQ     1$              ;BRANCH IF OK
3582  020720  104004                          ERROR +4                        ;CARD READER STATUS ERROR
3583
3584  020722                          1$:
3585                                  ;*****************************************************************
3586                                  ;*TEST 40       TEST PICK CHECK ERROR
3587                                  ;*****************************************************************
3588  020722  000004                  TST40:  SCOPE
3589                                  ;A PICK CHECK ERROR SHOULD SET BIT 15, BIT 14, AND BIT 12
3590                                  ;THIS ERROR OCCURS WHEN THE FEED MECHANISM FAILS TO DELIVER A CARD TO
3591                                  ;THE READ STATION WITHIN 400 MS.
3592                                  ;CAN ALSO BE FORCED BY FOLDING A CARD IN HALF
3593                                  ;AND PLACING IT INTO CARD READER 'INPUT HOPPER'
3594  020724  004737  025442                  JSR     PC,INIT
3595  020730  104400  031463                  TYPE,   MSG5            ;"REMOVE ALL CARDS FROM THE INPUT HOPPER"
3596  020734  104400  031330                  TYPE,   MSG2            ;"THEN HIT 'CONTINUE' ON THE CONSOLE"
3597  020740  104400  031702                  TYPE,   MSG8            ;"HOLD DOWN THE SWITCH UNDER THE CAP
3598                                                                  ;OF THE INPUT HOPPER"
3599  020744  104400  031274                  TYPE,   MSG1            ;"PRESS CARD READER 'RESET'"
3600  020750  104400  030246                  TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
3601  020754  000000                          HALT
3602  020756  032713  010000                  BIT     #10000, @CDS    ;CHECK FOR OFF-LINE
3603  020762  001001                          BNE     1$              ;BRANCH IF SET
3604  020764  104043                          ERROR +43                       ;OFF LINE NOT SET AFTER "CONTINUE"
3605
3606  020766  032713  000010          1$:     BIT     #10,    @CDS    ;CHECK FOR "TRANSITION TO ON LINE"
3607  020772  001775                          BEQ     1$              ;WAIT FOR IT
3608  020774  022713  140210                  CMP     #140210,@CDS    ;CHECK FOR CORRECT STATUS BITS
3609  021000  001401                          BEQ     2$              ;BRANCH IF OK
3610  021002  104004                          ERROR +4                        ;STATUS NOT EQUAL TO 140210
3611
3612  021004  012714  177701          2$:     MOV     #-77,   @CDC    ;SET UP COLUMN COUNT
3613  021010  012715  043766                  MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
3614  021014  005213                          INC     @CDS            ;READ
```

```
3615  021016  105713                    3$:     TSTB    @CDS            ;CHECK CONTROLLER READY
3616  021020  100376                            BPL     3$              ;WAIT FOR CONTROLLER READY
3617  021022  032713  010000                    BIT     #10000,@CDS     ;CHECK BIT12
3618  021026  001001                            BNE     4$              ;BRANCH IF SET
3619  021030  104043                            ERROR +43                       ;OFF-LINE (BIT 12) WASN'T SET
3620
3621  021032  005713                    4$:     TST     @CDS            ;CHECK SPECIAL CONDITION BIT
3622  021034  100401                            BMI     5$              ;BRANCH IF SET
3623  021036  104026                            ERROR +26                       ;SPECIAL CONDITION NOT SET
3624
3625  021040  032713  040000            5$:     BIT     #40000, @CDS    ;CHECK FOR CARD READER ERROR
3626  021044  001001                            BNE     6$              ;BRANCH IF SET
3627  021046  104035                            ERROR +35                       ;CARD READER ERROR BIT 14 NOT SET
3628
3629  021050  005777  160164            6$:     TST     @CDDB           ;TEST BIT15 OF STATUS REGISTER #2
3630  021054  100005                            BPL     7$              ;BRANCH IF NOT SET INDICATING
3631                                            ;OLD CD11 CONTROLLER
3632  021056  032777  020000  160154            BIT     #20000,@CDDB    ;IS PICK CHECK INDICATOR SET?
3633  021064  001001                            BNE     7$              ;BRANCH IF SET
3634  021066  104045                            ERROR +45               ;PICK CHECK BIT13 NOT SET
3635
3636  021070  031327  027577            7$:     BIT     @CDS,#027577    ;CHECK FOR EXTRA BITS
3637  021074  001401                            BEQ     10$             ;BRANCH IF OK
3638  021076  104015                            ERROR +15                       ;STATUS WORD ERROR
3639
3640  021100  012712  021334            10$:    MOV     #TINTF, @ADINT  ;LOAD RETURN POINTER
3641                                            ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
3642  021104  005046                            CLR     -(SP)           ;;
3643  021106  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3644  021112  012737  021122  000034            MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
3645  021120  104400                            TRAP                    ;;PUSH OLD PSW AN PCON STACK
3646  021122  016666  000002  000006  64$:     MOV     2(SP),6(SP)     ;;
3647  021130  012716  021136                    MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
3648  021134  000002                            RTI                     ;;RESTORE PSW
3649  021136  012637  000034            65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3650  021142  012637  001214                    MOV     (SP)+,$TMP6
3651  021146  052737  000340  001214            BIS     #340,$TMP6
3652  021154  013746  001214                    MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3653  021160  012746  021166                    MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
3654  021164  000002                            RTI                     ;; POP NEW PC AND PS
3655  021166                            66$:
3656                                            ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
3657  021166  005046                            CLR     -(SP)           ;;
3658  021170  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3659  021174  012737  021204  000034            MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
3660  021202  104400                            TRAP                    ;;PUSH OLD PSW AN PCON STACK
3661  021204  016666  000002  000006  67$:     MOV     2(SP),6(SP)     ;;
3662  021212  012716  021220                    MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
3663  021216  000002                            RTI                     ;;RESTORE PSW
3664  021220  012637  000034            68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3665  021224  012662  000002                    MOV     (SP)+,2(ADINT)
3666                                            ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
3667  021230  005046                            CLR     -(SP)           ;;
3668  021232  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
```

```
3669  021236  012737  021246  000034          MOV     #69$,34         ;;SETJP NEW TRAP VECTOT
3670  021244  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
3671  021246  016666  000002  000006  69$:    MOV     2(SP),6(SP)     ;;
3672  021254  012716  021262                  MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
3673  021260  000002                          RTI                     ;;RESTORE PSW
3674  021262  012637  000034          70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3675  021266  012637  001214                  MOV     (SP)+,$TMP6
3676  021272  042737  000340  001214          BIC     #340,$TMP6
3677  021300  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3678  021304  012746  021312                  MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
3679  021310  000002                          RTI                     ;; POP NEW PC AND PS
3680  021312                          71$:
3681  021312  012713  000100                  MOV     #100,   @CDS    ;SET INTERRUPT ENABLE
3682  021316  104400  031534                  TYPE,   MSG6            ;"RESTORE CARDS TO THE INPUT HOPPER"
3683  021322  104400  031274                  TYPE,   MSG1            ;"PRESS CARD READER 'RESET'"
3684  021326  104400  030246                  TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
3685  021332  000777                          BR      .               ;WAIT FOR THE INTERRUPT
3686
3687  021334  022626                  TINTF:  CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
3688  021336  012712  021564                  MOV     #TINTFA,@ADINT  ;LOAD RETURN POINTER
3689                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
3690  021342  005046                          CLR     -(SP)           ;;
3691  021344  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3692  021350  012737  021360  000034          MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
3693  021356  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
3694  021360  016666  000002  000006  64$:    MOV     2(SP),6(SP)     ;;
3695  021366  012716  021374                  MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
3696  021372  000002                          RTI                     ;;RESTORE PSW
3697  021374  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3698  021400  012637  001214                  MOV     (SP)+,$TMP6
3699  021404  052737  000340  001214          BIS     #340,$TMP6
3700  021412  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3701  021416  012746  021424                  MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
3702  021422  000002                          RTI                     ;; POP NEW PC AND PS
3703  021424                          66$:
3704                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
3705  021424  005046                          CLR     -(SP)           ;;
3706  021426  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3707  021432  012737  021442  000034          MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
3708  021440  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
3709  021442  016666  000002  000006  67$:    MOV     2(SP),6(SP)     ;;
3710  021450  012716  021456                  MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
3711  021454  000002                          RTI                     ;;RESTORE PSW
3712  021456  012637  000034          68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3713  021462  012662  000002                  MOV     (SP)+,2(ADINT)
3714                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
3715  021466  005046                          CLR     -(SP)           ;;
3716  021470  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3717  021474  012737  021504  000034          MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
3718  021502  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
3719  021504  016666  000002  000006  69$:    MOV     2(SP),6(SP)     ;;
3720  021512  012716  021520                  MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
3721  021516  000002                          RTI                     ;;RESTORE PSW
3722  021520  012637  000034          70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
```

```
3723  021524  012637  001214                  MOV     (SP)+,$TMP6
3724  021530  042737  000340  001214          BIC     #340,$TMP6
3725  021536  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3726  021542  012746  021550                  MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
3727  021546  000002                          RTI                     ;; POP NEW PC AND PS
3728  021550                          71$:
3729  021550  012714  177701                  MOV     #-77,   @CDC    ;SET UP COLUMN COUNT
3730  021554  012715  043766                  MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
3731  021560  005213                          INC     @CDS            ;START READING
3732  021562  000777                          BR      .               ;WAIT FOR AN INTERRUPT
3733
3734  021564  022626                  TINTFA: CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
3735  021566  022713  000300                  CMP     #000300,@CDS    ;CHECH THE CARD READER STATUS
3736  021572  001401                          BEQ     1$              ;BRANCH IF OK
3737  021574  104004                          ERROR +4                        ;CARD READER STATUS ERROR
3738
3739  021576                          1$:
3740                                  ;*****************************************************************
3741                                  ;*TEST 41        TEST STACK CHECK ERROR
3742                                  ;*****************************************************************
3743  021576  000004                  TST41:  SCOPE
3744                                  ;A STACK CHECK ERROR SHOULD SET BIT 15, BIT 14, AND BIT 12
3745                                  ;THIS ERROR OCCURS WHEN THE FEED MECHANISM FAILS TO DELIVER A CARD TO
3746                                  ;THE READ STATION
3747  021600  004737  025442                  JSR     PC,INIT
3748  021604  104400  031375                  TYPE,   MSG3            ;"PRESS CARD READER 'STOP'"
3749  021610  104400  031773                  TYPE,   MSG9            ;"SLIDE A CARD FROM THE OUTPUT HOPPER ABOUT
3750                                                                  ;HALF AN INCH BACK INTO THE READ HEAD
3751                                                                  ;BLOCKING THE PHOTO CELL
3752                                                                  ;NOTE: SOME CARD READER MODELS MAY HAVE
3753                                                                  ;A LARGE ROLLER BLOCKING ACCESS TO THE PHOTOCELL
3754                                                                  ;IN WHICH CASE, THE PHOTOCELL CAN BE
3755                                                                  ;BLOCKED BY TEARING OFF A PIECE OF CARD
3756                                                                  ;AND SLIPPING IT IN FRONT OF THE PHOTOCELL
3757  021614  104400  031274                  TYPE,   MSG1            ;"PRESS CARD READER 'RESET'"
3758  021620  104400  030246                  TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
3759  021624  032713  010000          TLOPG:  BIT     #10000, @CDS    ;CHECK FOR OF LINE
3760  021630  001775                          BEQ     TLOPG           ;WAIT FOR OFF-LINE
3761  021632  032713  000010          TLOPGA: BIT     #10,    @CDS    ;CHECK FOR "TRANSITION TO ON LINE"
3762  021636  001775                          BEQ     TLOPGA          ;WAIT FOR IT
3763  021640  022713  100210                  CMP     #100210,@CDS    ;CHECK FOR CORRECT STATUS BITS
3764  021644  001401                          BEQ     1$              ;BRANCH IF OK
3765  021646  104004                          ERROR +4                        ;STATUS NOT EQUAL TO 100210
3766
3767  021650  012714  177701          1$:     MOV     #-77,   @CDC    ;SET UP COLUMN COUNT
3768  021654  012715  043766                  MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
3769  021660  005213                          INC     @CDS            ;READ
3770  021662  105713          TLOPGB: TSTB    @CDS            ;CHECK CONTROLLER READY
3771  021664  100376                          BPL     TLOPGB          ;WAIT FOR CONTROLLER READY
3772  021666  032713  010000                  BIT     #10000,@CDS     ;CHECK BIT12
3773  021672  001001                          BNE     1$              ;BRANCH IF SET
3774  021674  104043                          ERROR +43                       ;OFF-LINE (BIT 12) WASN'T SET
3775
3776  021676  005713          1$:     TST     @CDS            ;CHECK SPECIAL CONDITION BIT
```

```
3777  021700  100401                        BMI     2$              ;BRANCH IF SET
3778  021702  104026                        ERROR +26               ;SPECIAL CONDITION NOT SET
3779
3780  021704  032713  040000          2$:   BIT     #40000, @CDS    ;CHECK FOR CARD READER ERROR
3781  021710  001001                        BNE     3$              ;BRANCH IF SET
3782  021712  104035                        ERROR +35               ;CARD READER ERROR BIT 14 NOT SET
3783
3784  021714  005777  157320          3$:   TST     @CDDB           ;TEST BIT15 OF STATUS REGISTER #2
3785  021720  100005                        BPL     4$              ;BRANCH IF NOT SET INDICATING
3786                                        ;OLD CD11 CONTROLLER
3787  021722  032777  010000  157310        BIT     #10000,@CDDB    ;IS STACK CHECK INDICATOR SET?
3788  021730  001001                        BNE     4$              ;BRANCH IF SET
3789  021732  104046                        ERROR +46               ;STACK CHECK BIT12 NOT SET
3790
3791  021734  032713  027577          4$:   BIT     #027577,@CDS    ;CHECK FOR EXTRA BITS
3792  021740  001401                        BEQ     5$              ;BRANCH IF OK
3793  021742  104015                        ERROR +15               ;STATUS WORD ERROR
3794
3795  021744  012712  022200          5$:   MOV     #TINTG, @ADINT  ;LOAD RETURN POINTER
3796                                        ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
3797  021750  005046                        CLR     -(SP)           ;;
3798  021752  013746  000034                MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3799  021756  012737  021766  000034        MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
3800  021764  104400                        TRAP                    ;;PUSH OLD PSW AN PCON STACK
3801  021766  016666  000002  000006  64$:  MOV     2(SP),6(SP)     ;;
3802  021774  012716  022002                MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
3803  022000  000002                        RTI                     ;;RESTORE PSW
3804  022002  012637  000034          65$:  MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3805  022006  012637  001214                MOV     (SP)+,$TMP6
3806  022012  052737  000340  001214        BIS     #340,$TMP6
3807  022020  013746  001214                MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3808  022024  012746  022032                MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
3809  022030  000002                        RTI                     ;; POP NEW PC AND PS
3810  022032                          66$:
3811                                        ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
3812  022032  005046                        CLR     -(SP)           ;;
3813  022034  013746  000034                MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3814  022040  012737  022050  000034        MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
3815  022046  104400                        TRAP                    ;;PUSH OLD PSW AN PCON STACK
3816  022050  016666  000002  000006  67$:  MOV     2(SP),6(SP)     ;;
3817  022056  012716  022064                MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
3818  022062  000002                        RTI                     ;;RESTORE PSW
3819  022064  012637  000034          68$:  MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3820  022070  012662  000002                MOV     (SP)+,2(ADINT)
3821                                        ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
3822  022074  005046                        CLR     -(SP)           ;;
3823  022076  013746  000034                MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3824  022102  012737  022112  000034        MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
3825  022110  104400                        TRAP                    ;;PUSH OLD PSW AN PCON STACK
3826  022112  016666  000002  000006  69$:  MOV     2(SP),6(SP)     ;;
3827  022120  012716  022126                MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
3828  022124  000002                        RTI                     ;;RESTORE PSW
3829  022126  012637  000034          70$:  MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3830  022132  012637  001214                MOV     (SP)+,$TMP6
```

```
3831  022136  042737  000340  001214          BIC     #340,$TMP6
3832  022144  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3833  022150  012746  022156                  MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
3834  022154  000002                          RTI                     ;; POP NEW PC AND PS
3835  022156                          71$:
3836  022156  012713  000100                  MOV     #100,   @CDS    ;SET INTERRUPT ENABLE
3837  022162  104400  032475                  TYPE,   MSG10           ;"REMOVE JAMMED CARDS"
3838  022166  104400  031274                  TYPE,   MSG1            ;"PRESS CARD READER 'RESET'"
3839  022172  104400  030246                  TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
3840  022176  000777                          BR      .               ;WAIT FOR THE INTERRUPT
3841
3842  022200  022626                  TINTG:  CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
3843  022202  012712  022430                  MOV     #TINTGA,@ADINT  ;LOAD RETURN POINTER
3844                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
3845  022206  005046                          CLR     -(SP)           ;;
3846  022210  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3847  022214  012737  022224  000034          MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
3848  022222  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
3849  022224  016666  000002  000006  64$:    MOV     2(SP),6(SP)     ;;
3850  022232  012716  02  40                  MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
3851  022236  000002                          RTI                     ;;RESTORE PSW
3852  022240  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3853  022244  012637  001214                  MOV     (SP)+,$TMP6
3854  022250  052737  000340  001214          BIS     #340,$TMP6
3855  022256  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3856  022262  012746  022270                  MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
3857  022266  000002                          RTI                     ;; POP NEW PC AND PS
3858  022270                          66$:
3859                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
3860  022270  005046                          CLR     -(SP)           ;;
3861  022272  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3862  022276  012737  022306  000034          MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
3863  022304  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
3864  022306  016666  000002  000006  67$:    MOV     2(SP),6(SP)     ;;
3865  022314  012716  022322                  MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
3866  022320  000002                          RTI                     ;;RESTORE PSW
3867  022322  012637  000034          68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3868  022326  012662  000002                  MOV     (SP)+,2(ADINT)
3869                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
3870  022332  005046                          CLR     -(SP)           ;;
3871  022334  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3872  022340  012737  022350  000034          MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
3873  022346  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
3874  022350  016666  000002  000006  69$:    MOV     2(SP),6(SP)     ;;
3875  022356  012716  022364                  MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
3876  022362  000002                          RTI                     ;;RESTORE PSW
3877  022364  012637  000034          70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3878  022370  012637  001214                  MOV     (SP)+,$TMP6
3879  022374  042737  000340  001214          BIC     #340,$TMP6
3880  022402  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3881  022406  012746  022414                  MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
3882  022412  000002                          RTI                     ;; POP NEW PC AND PS
3883  022414                          71$:
3884  022414  012714  177701                  MOV     #-77,   @CDC    ;SET UP COLUMN COUNT
```

```
3885  022420  012715  043766                  MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
3886  022424  005213                          INC     @CDS            ;START READING
3887  022426  000777                          BR      .               ;WAIT FOR AN INTERRUPT
3888
3889  022430  022626                  TINTGA: CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
3890  022432  022713  000300                  CMP     #000300,@CDS    ;CHECH THE CARD READER STATUS
3891  022436  001401                          BEQ     1$              ;BRANCH IF OK
3892  022440  104004                          ERROR +4                        ;CARD READER STATUS ERROR
3893
3894  022442                          1$:
3895                                  ;ON M-1000/M-200 BIT 13 IS ALWAYS CLEARED
3896                                  ;ON M-1200 IF END OF FILE BUTTON IS PRESSED WITH INPUT
3897                                  ;HOPPER LOADED THEN WHEN INPUT HOPPER BECOMES EMPTY
3898                                  ;HOPPER CHECK INDICATOR LIGHT COMES ON AND BITS
3899                                  ;13  14 AND  15 ARE SET
3900
3901
3902  022442  005737  001266                  TST     CD1000          ;IS READER M1000/M200?
3903  022446  001402                          BEQ     TSTM12          ;BRANCH IF READER IS M-1200
3904  022450  000137  023162                  JMP     TSTM10          ;OUT OF THIS TEST IF M1000/M200
3905
3906  022454                          TSTM12:
3907                                  ;*****************************************************************
3908                                  ;*TEST 42       TEST 'END OF FILE' AND HOPPER CHECK
3909                                  ;*****************************************************************
3910  022454  000004                  TST42:  SCOPE
3911  022456  004737  025442                  JSR     PC,     INIT
3912  022462  104400  033436                  TYPE,   MSG20           ;"PUT ANY TWO CARDS IN INPUT HOPPER"
3913  022466  104400  031274                  TYPE,   MSG1            ;"PRESS CARD READER 'RESET'"
3914  022472  104400  031330                  TYPE,   MSG2            ;"THEN HIT 'CONTINUE' ON THE CONSOLE"
3915  022476  104400  030246                  TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
3916  022502  000000                          HALT
3917
3918  022504  032713  000010          1$:     BIT     #10,    @CDS    ;CHECK FOR TRANSITION TO ON LINE
3919  022510  001775                          BEQ     1$              ;WAIT FOR IT
3920  022512  104400  033502                  TYPE,   MSG21           ;"PRESS END OF FILE BUTTON"
3921  022516  104400  031330                  TYPE,   MSG2            ;"THEN HIT 'CONTINUE' ON THE CONSOLE"
3922  022522  104400  030246                  TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
3923  022526  004737  025442                  JSR     PC,     INIT
3924  022532  000000                          HALT
3925
3926
3927  022534  032713  020000                  BIT     #20000, @CDS    ;CHECK BIT 13
3928  022540  001401                          BEQ     2$              ;BRANCH IF NOT SET
3929  022542  104047                          ERROR +47                       ;EOF SET FROM BEGINNING
3930
3931
3932  022544  032713  040000          2$:     BIT     #40000, @CDS    ;CHECK BIT 14
3933  022550  001401                          BEQ     3$              ;BRANCH IF NOT SET
3934  022552  104050                          ERROR +50                       ;READER CHECK ERROR SET FROM BEGINNING
3935
3936
3937  022554  032713  000004          3$:     BIT     #4,     @CDS    ;CHECK BIT 2
3938  022560  001401                          BEQ     4$              ;BRANCH IF NOT SET
```

```
3939  022562  104051                          ERROR +51                       ;HOPPER CHECK SET FROM BEGINNING
3940
3941  022564  005713              4$:         TST     @CDS                    ;CHECK ERROR BIT
3942  022566  100001                          BPL     5$                      ;BRANCH IF NOT SET
3943  022570  104014                          ERROR +14                       ;ERROR SET FROM BEGINNING
3944
3945
3946
3947
3948  022572  012712  023024      5$:         MOV     #TINTI, @ADINT          ;LOAD RETURN POINTER
3949  022576                      SECN:
3950                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
3951  022576  005046                          CLR     -(SP)                   ;;
3952  022600  013746  000034                  MOV     34,-(SP)                ;;SAVE CURRENT TRAP VECTOR
3953  022604  012737  022614  000034        MOV     #64$,34                 ;;SETUP NEW TRAP VECTOT
3954  022612  104400                          TRAP                            ;;PUSH OLD PSW AN PCON STACK
3955  022614  016666  000002  000006  64$:   MOV     2(SP),6(SP)             ;;
3956  022622  012716  022630                  MOV     #65$,(SP)                       ;;REPLACE OLD PC WITH NEW
3957  022626  000002                          RTI                             ;;RESTORE PSW
3958  022630  012637  000034          65$:    MOV     (SP)+,34                        ;;RESTORE OLD TRAP  VECTOR
3959  022634  012637  001214                  MOV     (SP)+,$TMP6
3960  022640  052737  000340  001214        BIS     #340,$TMP6
3961  022646  013746  001214                  MOV     $TMP6,-(SP)             ;;PUT NEW PS ON STACK
3962  022652  012746  022660                  MOV     #66$,-(SP)              ;;PUT NEW PC ON  STACK
3963  022656  000002                          RTI                             ;; POP NEW PC AND PS
3964  022660                          66$:
3965                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
3966  022660  005046                          CLR     -(SP)                   ;;
3967  022662  013746  000034                  MOV     34,-(SP)                ;;SAVE CURRENT TRAP VECTOR
3968  022666  012737  022676  000034        MOV     #67$,34                 ;;SETUP NEW TRAP VECTOT
3969  022674  104400                          TRAP                            ;;PUSH OLD PSW AN PCON STACK
3970  022676  016666  000002  000006  67$:   MOV     2(SP),6(SP)             ;;
3971  022704  012716  022712                  MOV     #68$,(SP)                       ;;REPLACE OLD PC WITH NEW
3972  022710  000002                          RTI                             ;;RESTORE PSW
3973  022712  012637  000034          68$:    MOV     (SP)+,34                        ;;RESTORE OLD TRAP  VECTOR
3974  022716  012662  000002                  MOV     (SP)+,2(ADINT)
3975                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
3976  022722  005046                          CLR     -(SP)                   ;;
3977  022724  013746  000034                  MOV     34,-(SP)                ;;SAVE CURRENT TRAP VECTOR
3978  022730  012737  022740  000034        MOV     #69$,34                 ;;SETUP NEW TRAP VECTOT
3979  022736  104400                          TRAP                            ;;PUSH OLD PSW AN PCON STACK
3980  022740  016666  000002  000006  69$:   MOV     2(SP),6(SP)             ;;
3981  022746  012716  022754                  MOV     #70$,(SP)                       ;;REPLACE OLD PC WITH NEW
3982  022752  000002                          RTI                             ;;RESTORE PSW
3983  022754  012637  000034          70$:    MOV     (SP)+,34                        ;;RESTORE OLD TRAP  VECTOR
3984  022760  012637  001214                  MOV     (SP)+,$TMP6
3985  022764  042737  000340  001214        BIC     #340,$TMP6
3986  022772  013746  001214                  MOV     $TMP6,-(SP)             ;;PUT NEW PS ON STACK
3987  022776  012746  023004                  MOV     #71$,-(SP)              ;;PUT NEW PC ON  STACK
3988  023002  000002                          RTI                             ;; POP NEW PC AND PS
3989  023004                          71$:
3990  023004  012713  000100                  MOV     #100,   @CDS            ;SET INTERRUPT ENABLE
3991  023010  012714  177701                  MOV     #-77,   @CDC            ;SET UP COLUMN COUNT
3992  023014  012715  043766                  MOV     #BUFBEG,@CDA            ;SET UP BUS ADDRESS
```

```
3993  023020  005213                          INC     @CDS            ;START READER
3994  023022  000777                          BR      .               ;WAIT FOR AN INTERRUPT
3995
3996
3997  023024  022626                  TINTI:  CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
3998
3999  023026  032713  020000                  BIT     #20000, @CDS    ;CHECK BIT 13
4000  023032  001401                          BEQ     1$              ;BRANCH IF NOT SET
4001  023034  104047                          ERROR +47                       ;EOF SET AT END OF ONE CARD
4002
4003  023036  032713  040000          1$:     BIT     #40000, @CDS    ;CHECK BIT 14
4004  023042  001401                          BEQ     2$              ;BRANCH IF NOT SET
4005  023044  104050                          ERROR +50                       ;READER CHECK ERROR SET AT END OF ONE CARD
4006
4007  023046  005713                  2$:     TST     @CDS            ;CHECK ERROR BIT
4008  023050  100001                          BPL     3$              ;BRANCH IF NOT SET
4009  023052  104014                          ERROR +14                       ;ERROR SET AT END OF ONE CARD
4010
4011  023054  012712  023062          3$:     MOV     #TINTIA,@ADINT  ;LOAD RETURN POINTER
4012  023060  000646                          BR      SECN            ;READ SECOND CARD
4013  023062  022626                  TINTIA: CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
4014
4015  023064  032713  020000                  BIT     #20000, @CDS    ;CHECK BIT 13
4016  023070  001001                          BNE     1$              ;BRANCH IF SET
4017  023072  104052                          ERROR +52                       ;EOF NOT SET AT END OF FILE
4018
4019  023074  032713  040000          1$:     BIT     #40000, @CDS    ;CHECK BIT 14
4020  023100  001001                          BNE     2$              ;BRANCH IF SET
4021  023102  104053                          ERROR +53                       ;READER CHECK NOT SET AT END OF FILE
4022
4023  023104  032713  000004          2$:     BIT     #4,     @CDS    ;CHECK BIT 2
4024  023110  001001                          BNE     3$              ;BRANCH IF SET
4025  023112  104054                          ERROR +54                       ;HOPPER CHECK NOT SET WHEN HOPPER EMPTY
4026
4027
4028  023114  005713                  3$:     TST     @CDS            ;CHECK ERROR BIT
4029  023116  100401                          BMI     4$              ;BRANCH IF SET
4030  023120  104026                          ERROR +26                       ;ERROR BIT NOT SET AT END OF FILE
4031
4032  023122  104400  031534          4$:     TYPE,   MSG6            ;"RESTORE CARDS TO THE INPUT HOPPER"
4033  023126  104400  031274                  TYPE,   MSG1            ;"PRESS CARD READER  RESET'"
4034  023132  104400  031330                  TYPE,   MSG2            ;"THEN HIT CONTINUE ON THE CONSOLE"
4035  023136  104400  030246                  TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
4036  023142  000000                          HALT
4037
4038  023144  032713  000010          5$:     BIT     #10,    @CDS    ;CHECK TRANSITION TO ON LINE
4039  023150  001775                          BEQ     5$              ;WAIT FOR IT
4040
4041
4042  023152  032713  020000                  BIT     #20000, @CDS    ;CHECK BIT 13
4043  023156  001401                          BEQ     TSTM10          ;BRANCH IF NOT SET
4044  023160  104055                          ERROR +55                       ;EOF DIDN'T CLEAR BY TRANSITION TO ON LINE
4045
4046  023162                          TSTM10:
```

```
                                ;*****************************************************************
                                ;*TEST 43        TEST READ CHECK ERROR
                                ;*****************************************************************
023162  000004                  TST43:  SCOPE
                                ;A READ CHECK ERROR SHOULD SET BIT 15, BIT 14, AND BIT 12
                                ;THIS ERROR OCCURS WHEN THE READ ELECTRONICS IN THE CARD
                                ;READER DISAGREES WITH THE NORMAL UNPUNCHED AREA OF THE CARD
023164  004737  025442                  JSR     PC,INIT
023170  104400  032574                  TYPE,   MSG12           ;"PLACE SPECIAL DARK LIGHT CHECK CARD ONLY
                                                                ;AT THE FRONT OF THE INPUT STACK"
023174  104400  031274                  TYPE,   MSG1            ;"PRESS CARD READER 'RESET'"
023200  104400  030246                  TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
023204  032713  010000          TLOPH:  BIT     #10000, @CDS    ;CHECK FOR OF LINE
023210  001775                  TLOPH   BEQ     TLOPH           ;WAIT FOR OFF-LINE
023212  032713  000010          TLOPHA: BIT     #10,    @CDS    ;CHECK FOR "TRANSITION TO ON LINE"
023216  001775                  TLOPHA  BEQ     TLOPHA          ;WAIT FOR IT
023220  022713  140210                  CMP     #140210,@CDS    ;CHECK FOR CORRECT STATUS BITS
023224  001401                  1$      BEQ     1$              ;BRANCH IF OK
023226  104004                          ERROR +4                        ;STATUS NOT EQUAL TO 140210

023230  012714  177701          1$:     MOV     #-77,   @CDC    ;SET UP COLUMN COUNT
023234  012715  043766                  MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
023240  005213                          INC     @CDS            ;READ
023242  105713                  TLOPHB: TSTB    @CDS            ;CHECK CONTROLLER READY
023244  100376                          BPL     TLOPHB          ;WAIT FOR CONTROLLER READY
023246  032713  010000                  BIT     #10000,@CDS     ;CHECK BIT12
023252  001001                          BNE     1$              ;BRANCH IF SET
023254  104043                          ERROR +43               ;OFF-LINE (BIT 12) WASN'T SET

023256  005713                  1$:     TST     @CDS            ;CHECK SPECIAL CONDITION BIT
023260  100401                          BMI     2$              ;BRANCH IF SET
023262  104026                          ERROR +26               ;SPECIAL CONDITION NOT SET

023264  032713  040000          2$:     BIT     #40000, @CDS    ;CHECK FOR CARD READER ERROR
023270  001001                          BNE     3$              ;BRANCH IF SET
023272  104053                          ERROR +53               ;CARD READER ERROR BIT 14 NOT SET

023274  005777  155740          3$:     TST     @CDDB           ;TEST BIT15 OF STATUS REGISTER #2
023300  100005                          BPL     4$              ;BRANCH IF NOT SET INDICATING
                                                                ;OLD CD11 CONTROLLER
023302  032777  040000  155730          BIT     #40000,@CDDB    ;IS READ CHECK INDICATOR SET?
023310  001001                          BNE     4$              ;BRANCH IF SET
023312  104056                          ERROR +56               ;READ CHECK BIT14 NOT SET

023314  032713  027577          4$:     BIT     #027577,@CDS    ;CHECK FOR EXTRA BITS
023320  001401                          BEQ     5$              ;BRANCH IF OK
023322  104015                          ERROR +15               ;STATUS WORD ERROR

023324  012712  023562          5$:     MOV     #TINTH, @#INT   ;LOAD RETURN POINTER
                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
023330  005046                  CLR     -(SP)           ;;
023332  013746  000034          MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
023336  012737  023346  000034  MOV     #64$,34         ;;SETUP NEW TRAP VECTOR
023344  104400                  TRAP                    ;;PUSH OLD PSW AN PCON STACK
```

```
4101  023346  016666  000002  000006  64$:    MOV     2(SP),6(SP)     ;;
4102  023354  012716  023362                  MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
4103  023360  000002                          RTI                     ;;RESTORE PSW
4104  023362  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
4105  023366  012637  001214                  MOV     (SP)+,$TMP6
4106  023372  052737  000340  001214          BIS     #340,$TMP6
4107  023400  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
4108  023404  012746  023412                  MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
4109  023410  000002                          RTI                     ;; POP NEW PC AND PS
4110  023412                          66$:
4111                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT),"
4112  023412  005046                  CLR     -(SP)           ;;
4113  023414  013746  000034          MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
4114  023420  012737  023430  000034  MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
4115  023426  104400                  TRAP                    ;;PUSH OLD PSW AN PCON STACK
4116  023430  016666  000002  000006  67$:    MOV     2(SP),6(SP)     ;;
4117  023436  012716  023444                  MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
4118  023442  000002                          RTI                     ;;RESTORE PSW
4119  023444  012637  000034          68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
4120  023450  012662  000002                  MOV     (SP)+,2(ADINT)
4121                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
4122  023454  005046                  CLR     -(SP)           ;;
4123  023456  013746  000034          MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
4124  023462  012737  023472  000034  MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
4125  023470  104400                  TRAP                    ;;PUSH OLD PSW AN PCON STACK
4126  023472  016666  000002  000006  69$:    MOV     2(SP),6(SP)     ;;
4127  023500  012716  023506                  MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
4128  023504  000002                          RTI                     ;;RESTORE PSW
4129  023506  012637  000034          70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
4130  023512  012637  001214                  MOV     (SP)+,$TMP6
4131  023516  042737  000340  001214          BIC     #340,$TMP6
4132  023524  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
4133  023530  012746  023536                  MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
4134  023534  000002                          RTI                     ;; POP NEW PC AND PS
4135  023536                          71$:
4136  023536  012713  000100                  MOV     #100,   @CDS    ;SET INTERRUPT ENABLE
4137  023542  104400  031534                  TYPE,   MSG6            ;"RESTORE CARDS TO THE INPUT HOPPER"
4138  023546  104400  031274                  TYPE,   MSG1            ;"PRESS CARD READER 'RESET'"
4139  023552  104400  030246                  TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
4140  023556  000777                          BR      .               ;WAIT FOR AN INTERRUPT
4141  023560  000000                          HALT
4142  023562  022626          TINTH:  CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
4143  023564  000004                          SCOPE
4144  023566  104400  001222                  TYPE,   $BELL           ;RING-A-DING
4145  023572  000137  016074                  JMP     ER12CD          ;LOOP BACK TO THE BEGINNING
4146
4147
4148
4149                                  ;*************************************************************************
4150                                  ;ROUTINE TO LOOP THRU A SINGLE INSTRUCTION TEST OR ERROR FUNCTION TEST
4151                                  ;NOTE THAT SW11 MUST BE DOWN AFTER 2ND HALT
4152                                  ;NOTE THAT SW(14) MUST BE SET.....MUST BE SET.....MUST BE SET.....
4153                                  ;*************************************************************************
4154  023576                          TESTX:
```

```
4155  023576  012706  001100                    MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
4156  023602  005026                            CLR     (R6)+           ;;CLEAR MEMORY LOCATION
4157  023604  022706  001126                    CMP     #$BDDAT,R6      ;;DONE?
4158  023610  001374                            BNE     .-6             ;;LOOP BACK IF NO
4159  023612  012706  001100                    MOV     #STACK,SP       ;;SETUP THE STACK POINTER
4160  023616  012737  026024  000020            MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
4161  023624  012737  000340  000022            MOV     #340,@#IOTVEC+2 ;;LEVEL 7
4162  023632  012737  025650  000030            MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
4163  023640  012737  000340  000032            MOV     #340,@#EMTVEC+2 ;;LEVEL 7
4164  023646  012737  027072  000034            MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
4165  023654  012737  000340  000036            MOV     #340,@#TRAPVEC+2;LEVEL 7
4166  023662  012737  027126  000024            MOV     #$PWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
4167  023670  012737  000340  000026            MOV     #340,@#PWRVEC+2 ;;LEVEL 7
4168  023676  013737  014740  014732            MOV     $ENDCT,$EOPCT   ;;SETUP END-OF-PROGRAM COUNTER
4169  023704  005037  001220                    CLR     $TIMES          ;;INITIALIZE NUMBER OF ITERATIONS
4170  023710  012737  015104  000014            MOV     #$RTRN,@#TBITVEC ;;SET "T" BIT VECTOR TO $RTRN
4171  023716  012737  000340  000016            MOV     #340,@#TBITVEC+2 ;;LEVEL 7
4172  023724  012737  000002  015104            MOV     #RTI,$RTRN      ;;SET $RTRN TO A RTI
4173  023732  012737  023760  000010            MOV     #65$,@#RESVEC   ;;TRY TO DO A RTT
4174  023740  005046                            CLR     -(SP)           ;;DUMMY PS
4175  023742  012746  023750                    MOV     #64$,-(SP)      ;;AND PC
4176  023746  000006                            RTT                     ;;TRY THE RTT
4177  023750  012737  000006  015104  64$:     MOV     #RTT,$RTRN      ;;RTT IS LEGAL--SET $RTRN TO A RTT
4178  023756  000402                            BR      66$
4179  023760  062706  000010          65$:     ADD     #10,SP          ;;RTT ILLEGAL--CLEAN OFF THE STACK
4180  023764  012737  000012  000010  66$:     MOV     #RESVEC+2,@#RESVEC ;;RESTORE TRAP CATCHER
4181  023772  005037  015112                    CLR     $TBIT           ;;CLEAR "T" BIT SWITCH
4182  023776  012737  023776  001106            MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
4183  024004  013746  000004                    MOV     @#4,-(SP)       ;;SAVE ERROR VECTOR
4184  024010  013746  000006                    MOV     @#6,-(SP)
4185  024014  012737  024030  000004            MOV     #67$,4          ;;SET UP TIME OUT VECTOR
4186  024022  005777  155110                    TST     @SWR            ;;TRY TO REFERENCE HARDWARE SWR
4187  024026  000407                            BR      68$             ;;BRANCH IF NO TIMEOUT TRAP OCCURS
4188  024030  012737  000176  001136  67$:     MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
4189  024036  012737  000174  001140            MOV     #DISPREG,DISPLAY ;;POINT TO SOFTWARE DISPLAY REG
4190  024044  022626                            CMP     (SP)+,(SP)+     ;;RESTORE STACK
4191  024046  012637  000006          68$:     MOV     (SP)+,@#6       ;;RESTORE ERROR VECTOR
4192  024052  012637  000004                    MOV     (SP)+,@#4
4193  024056  004737  043712                    JSR     PC,SETUP                ;SETUP POINTERS AND FLAGS
4194  024062  104400  034073                    TYPE,   MSG23                   ;ASK USER TO LOAD ADDRESS OF DESIRED
4195                                                                            ;TEST INTO SWITCH REGISTER, THEN
4196                                                                            ;PRESS CONTINUE
4197  024066  000000                            HALT                            ;WAIT FOR STARTING ADDRESS
4198  024070  017737  155042  024320            MOV     @SWR,RETRNX             ;STORE STARTING ADDRESS
4199  024076  062737  000002  024320            ADD     #2,RETRNX               ;CHANGE TO FIRST ADDRESS AFTER SCOPE INSTRUCTION
4200  024104  104400  034342                    TYPE,   MSG24                   ;ASK USER TO SET SWITCH REGISTER
4201                                                                            ;OPTIONS, THEN PRESS CONTINUE
4202  024110  000000                            HALT                            ;SET SWR OPTIONS (BIT 11 MUST = 0)
4203  024112  032777  010000  155016            BIT     #10000,@SWR             ;CHECK SW12
4204  024120  001432                            BEQ     1$                      ;BRANCH IF NOT SET
4205                                            ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #20,PS"
4206  024122  005046                            CLR     -(SP)           ;;
4207  024124  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
4208  024130  012737  024140  000034            MOV     #69$,34         ;;SETUP NEW TRAP VECTOR
```

```
4209  024136  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
4210  024140  016666  000002  000006  69$:    MOV     2(SP),6(SP)     ;;
4211  024146  012716  024154                  MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
4212  024152  000002                          RTI                     ;;RESTORE PSW
4213  024154  012637  000034          70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
4214  024160  012637  001214                  MOV     (SP)+,$TMP6
4215  024164  042737  000020  001214          BIC     #20,$TMP6
4216  024172  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
4217  024176  012746  024204                  MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
4218  024202  000002                          RTI                     ;; POP NEW PC AND PS
4219  024204                          71$:
4220  024204  000431                          BR      2$                      ;SKIP NEXT INSTRUCTION
4221  024206                          1$:
4222                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "SIS #20,PS"
4223  024206  005046                          CLR     -(SP)           ;;
4224  024210  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
4225  024214  012737  024224  000034          MOV     #72$,34         ;;SETUP NEW TRAP VECTOT
4226  024222  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
4227  024224  016666  000002  000006  72$:    MOV     2(SP),6(SP)     ;;
4228  024232  012716  024240                  MOV     #73$,(SP)               ;;REPLACE OLD PC WITH NEW
4229  024236  000002                          RTI                     ;;RESTORE PSW
4230  024240  012637  000034          73$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
4231  024244  012637  001214                  MOV     (SP)+,$TMP6
4232  024250  052737  000020  001214          BIS     #20,$TMP6
4233  024256  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
4234  024262  012746  024270                  MOV     #74$,-(SP)      ;;PUT NEW PC ON  STACK
4235  024266  000002                          RTI                     ;; POP NEW PC AND PS
4236  024270                          74$:
4237  024270  012737  024276  027274  2$:     MOV     #XLOOP,RETURN           ;SAVE RETURN POINT FOR THIS SECTION
4238                                                                  ;FOR POWER FAILURE RETURN
4239  024276  104400  030254          XLOOP:  TYPE,   STMES           ;TYPE MAINDEC TITLE & REV. LEVEL
4240  024302  104400  031152                  TYPE,   MLOOP           ;INDICATE "ENTERING A LOOP ON TEST
4241                                                                  ;SELECTED BY THE USER"
4242  024306  013737  024320  001106          MOV     RETRNX,$LPADR   ;STORE 1ST ADDRESS OF TEST FOR LOOPING
4243                                                                  ;$LPADR WILL BE PICKED UP BY 'SCOPE'
4244  024314  000177  000000                  JMP     @RETRNX         ;JUMP TO TEST SELECTED
4245  024320  000000          RETRNX: 0
4246
4247
4248
4249                                  ;*********************************************************************
4250                                  ;ROUTINE TO CHECK CARDS WHICH HAVE ALL COLUMNS IDENTICALLY PUNCHED.
4251                                  ;THIS ROUTINE ALLOWS SPECIFIC TYPES OF DATA FAILURES TO BE STUDIED
4252                                  ;EASILY.  THE ROUTINE HALTS ONCE AT THE START.  SET THE CORRECT CARD
4253                                  ;IMAGE PATTERN IN SW11-SW00, THEN HIT CONTINUE (AFTER THE DECK IS
4254                                  ;LOADED AND CARD READER IS ON-LINE).  THE PATTERN IS STORED, AND THEN
4255                                  ;EACH COLUMN OF EACH CARD IS READ TWICE AND COMPARED WITH IT.  IF A
4256                                  ;DISCREPANCY OCCURS, THE ERROR IS PRINTED OUT ALONG WITH THE TOTAL
4257                                  ;NUMBER OF CARDS READ AND THE TOTAL NUMBER OF DATA ERRORS DISCOVERED
4258                                  ;UP TO THAT POINT (ALL PRINTOUTS ARE IN OCTAL).  WHEN THE INPUT HOPPER
4259                                  ;IS EMPTY, THE ROUTINE RINGS THE BELL AND WAITS FOR MORE CARDS TO BE
4260                                  ;LOADED AND THE CARD READER TO BE PUT BACK ON-LINE.
4261                                  ;SW15=1 CAUSES A HALT AFTER AN ERROR, AND SW13=1 INHIBITS ERROR PRINTOUTS.
4262                                  ;*********************************************************************
```

```
4263
4264  024322                                  CKSAME:
4265  024322  012706  001100                          MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
4266  024326  005026                                  CLR     (R6)+           ;;CLEAR MEMORY LOCATION
4267  024330  022706  001126                          CMP     #$BOOAT,R6      ;;DONE?
4268  024334  001374                                  BNE     .-6             ;;LOOP BACK IF NO
4269  024336  012706  001100                          MOV     #STACK,SP       ;;SETUP THE STACK POINTER
4270  024342  012737  026024  000020                  MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
4271  024350  012737  000340  000022                  MOV     #340,@#IOTVEC+2 ;;LEVEL 7
4272  024356  012737  025650  000030                  MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
4273  024364  012737  000340  000032                  MOV     #340,@#EMTVEC+2 ;;LEVEL 7
4274  024372  012737  027072  000034                  MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
4275  024400  012737  000340  000036                  MOV     #340,@#TRAPVEC+2;LEVEL 7
4276  024406  012737  027126  000024                  MOV     #$PWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
4277  024414  012737  000340  000026                  MOV     #340,@#PWRVEC+2 ;;LEVEL 7
4278  024422  013737  014740  014732                  MOV     $ENDCT,$EOPCT   ;;SETUP END-OF-PROGRAM COUNTER
4279  024430  005037  001220                          CLR     $TIMES          ;;INITIALIZE NUMBER OF ITERATIONS
4280  024434  012737  015104  000014                  MOV     #$RTRN,@#TBITVEC ;;SET "T" BIT VECTOR TO $RTRN
4281  024442  012737  000340  000016                  MOV     #340,@#TBITVEC+2 ;;LEVEL 7
4282  024450  012737  000002  015104                  MOV     #RTI,$RTRN      ;;SET $RTRN TO A RTI
4283  024456  012737  024504  000010                  MOV     #65$,@#RESVEC   ;;TRY TO DO A RTT
4284  024464  005046                                  CLR     -(SP)           ;;DUMMY PS
4285  024466  012746  024474                          MOV     #64$,-(SP)      ;;AND PC
4286  024472  000006                                  RTT                     ;;TRY THE RTT
4287  024474  012737  000006  015104  64$:     MOV     #RTT,$RTRN      ;;RTT IS LEGAL--SET $RTRN TO A RTT
4288  024502  000402                          BR      66$
4289  024504  062706  000010          65$:     ADD     #10,SP          ;;RTT ILLEGAL--CLEAN OFF THE STACK
4290  024510  012737  000012  000010  66$:     MOV     #RESVEC+2,@#RESVEC ;;RESTORE TRAP CATCHER
4291  024516  005037  015112                  CLR     $TBIT           ;;CLEAR "T" BIT SWITCH
4292  024522  012737  024522  001106          MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
4293  024530  013746  000004                  MOV     @#4,-(SP)       ;;SAVE ERROR VECTOR
4294  024534  013746  000006                  MOV     @#6,-(SP)
4295  024540  012737  024554  000004          MOV     #67$,4          ;;SET UP TIME OUT VECTOR
4296  024546  005777  154364                  TST     @SWR            ;;TRY TO REFERENCE HARDWARE SWR
4297  024552  000407                          BR      68$             ;;BRANCH IF NO TIMEOUT TRAP OCCURS
4298  024554  012737  000176  001136  67$:     MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
4299  024562  012737  000174  001140          MOV     #DISPREG,DISPLAY ;;POINT TO SOFTWARE DISPLAY REG
4300  024570  022626                          CMP     (SP)+,(SP)+     ;;RESTORE STACK
4301  024572  012637  000006          68$:     MOV     (SP)+,@#6       ;;RESTORE ERROR VECTOR
4302  024576  012637  000004                  MOV     (SP)+,@#4
4303  024602  012737  024322  027274          MOV     #CKSAME,RETURN          ;SAVE RETURN POINT FOR THIS SECTION
4304                                                                  ;FOR POWER FAILURE ROUTINE
4305  024610  104400  030254                  TYPE,   STMES                   ;TYPE MAINDEC TITLE & REV. LEVEL
4306  024614  104400  031225                  TYPE,   MPATS                   ;INDICATE "ENTERING SINGLE DATA
4307                                                                  ;PATTERN TESTING"
4308  024620  004737  043712                  JSR     PC,SETUP        ;INITIALIZE POINTERS
4309  024624  104400  034444                  TYPE,   MSG25                   ;ASK USER TO LOAD PATTERN VALUE INTO
4310                                                                  ;SWITCH REGISTER SWS<11:0>. THEN
4311                                                                  ;PRESS CONTINUE
4312  024630  000000                          HALT                    ;WAIT FOR CARD IMAGE PATTERN
4313  024632  017737  154300  025434          MOV     @SWR,CARDIM     ;STORE PATTERN
4314  024640  042737  170000  025434          BIC     #170000,CARDIM  ;CLEAR UPPER BITS OF PATTERN
4315  024646  013737  025434  025436          MOV     CARDIM, CDPKD
4316  024654  005037  025440                  CLR     DERFLG
```

```
4317  024660  006037  025436                  ROR     CDPK0
4318  024664  106137  025437                  ROLB    CDPK1
4319  024670  106037  025436                  RORB    CDPK0
4320  024674  106137  025437                  ROLB    CDPK1
4321  024700  106137  025437                  ROLB    CDPK1
4322  024704  106137  025437                  ROLB    CDPK1
4323  024710  106137  025437                  ROLB    CDPK1
4324  024714  012701  000007                  MOV     #7,     R1
4325  024720  006037  025436          CKLOP1: ROR     CDPK0
4326  024724  103004                          BCC     CKOVR
4327  024726  005237  025440                  INC     DERFLG
4328  024732  150137  025437                  BISB    R1,CDPK1
4329  024736  005301                  CKOVR:  DEC     R1
4330  024740  001367                          BNE     CKLOP1
4331  024742  104400  034342                  TYPE,   MSG24                   ;ASK USER TO SET SWITCH REGISTER
4332                                                                          ;OPTIONS, THEN PRESS CONTINUE
4333  024746  000000                          HALT                    ;WAIT FOR SWITCH SETTINGS
4334  024750  004737  025442          CKSTRT: JSR     PC,INIT
4335  024754  005037  025432                  CLR     TOTCRD          ;INITIALIZE CARD COUNT
4336  024760  005037  025430                  CLR     TOTERR          ;INITIALIZE ERROR COUNT
4337  024764  005037  001260                  CLR     ERFLG           ;CLEAR FLAG FOR PRINTING ERROR HEADING
4338  024770  105037  025441          CKLOOP: CLRB    DERFLG+1
4339  024774  032777  000010  154134          BIT     #10,    @SWR    ;CHECK FOR PACK MODE ONLY
4340  025002  001410                          BEQ     CKREAD          ;BRANCH IF NOT SET
4341  025004  032777  000004  154124          BIT     #4,@SWR         ;CHECK FOR IMAGE MODE ONLY
4342  025012  001004                          BNE     CKREAD          ;BRANCH IF SET
4343  025014  052713  000002                  BIS     #2,     @CDS    ;SET PACKING MODE
4344  025020  105137  025441                  COMB    DERFLG+1
4345  025024  005037  015300          CKREAD: CLR     CLCNT           ;INITIALIZE COLUMN COUNT
4346  025030  012700  043766                  MOV     #BUFBEG,R0      ;SET UP BUFFER POINTER
4347  025034  012714  177660                  MOV     #-120,  @CDC    ;SET UP COLUMN COUNTER
4348  025040  010015                          MOV     R0,     @CDA    ;SET UP BUS ADDRESS
4349  025042  005213                          INC     @CDS            ;START READING CARD
4350  025044  005237  025432                  INC     TOTCRD          ;INCREMENT CARD COUNT
4351  025050  105713                  CKLP1:  TSTB    @CDS            ;CHECK CONTROLLER READY
4352  025052  100376                          BPL     CKLP1           ;LOOP IF NOT SET
4353  025054  005713                          TST     @CDS            ;CHECK FOR ERROR
4354  025056  100435                          BMI     CKERR           ;BRANCH IF ERROR SET
4355  025060  005737  025440                  TST     DERFLG
4356  025064  100012                          BPL     CKLOP2
4357  025066  122037  025437          CKLOP3: CMPB    (R0)+,CDPK1     ;CHECK DATA (PACKED MODE)
4358  025072  001054                          BNE     CKFAIL
4359  025074  005237  015300                  INC     CLCNT
4360  025100  023727  015300  000120          CMP     CLCNT,#120
4361  025106  001367                          BNE     CKLOP3
4362  025110  000727                          BR      CKLOOP
4363  025112  012037  001200          CKLOP2: MOV     (R0)+,$TMP0             ;GET VALUE READ FROM CARD
4364  025116  042737  170000  001200          BIC     #170000,$TMP0           ;STRIP OFF BITS 15 THRU 12
4365                                                                          ;IN THE EVENT WE ARE TESTING A CD20
4366  025124  023737  001200  025434          CMP     $TMP0,  CARDIM          ;CHECK THE DATA (IMAGE MODE)
4367  025132  001034                          BNE     CKFAIL          ;BRANCH IF DATA ERROR
4368  025134  005237  015300                  INC     CLCNT           ;COUNT THE COLUMNS
4369  025140  023727  015300  000120          CMP     CLCNT,  #120    ;CHECK FOR LAST COLUMN
4370  025146  001361                          BNE     CKLOP2
```

```
4371  025150  000707                          BR      CKLOOP
4372
4373  025152  032713  010000          CKERR:  BIT     #10000,@CDS     ;CHECK FOR OFFLINE
4374  025156  001406                          BEQ     CKERR1          ;BRANCH IF NOT
4375  025160  104400  001222                  TYPE,   $BELL           ;RING-A-DING
4376  025164  032713  000010          CKERR3: BIT     #10,    @CDS    ;CHECK TRANSITION TO ON-LINE
4377  025170  001775                          BEQ     CKERR3          ;BRANCH IF OFF-LINE
4378  025172  000666                          BR      CKSTRT          ;START OVER
4379
4380  025174  032713  004000          CKERR1: BIT     #4000,@CDS      ;CHECK FOR DATA ERROR
4381  025200  001407                          BEQ     CKERR2
4382  025202  005737  025440                  TST     DERFLG
4383  025206  100004                          BPL     CKERR2
4384  025210  122737  000001  025440          CMPB    #1,DERFLG
4385  025216  003323                          BGT     CKLOP3          ;BRANCH IF LEGIT
4386  025220  104062                  CKERR2: ERROR +62                       ;REAL, LIVE ERROR.
4387  025222  000662                          BR      CKLOOP
4388
4389  025224  005237  025430          CKFAIL: INC     TOTERR          ;COUNT ERRORS
4390  025230  032777  020000  153700          BIT     #20000,@SWR     ;CHECK FOR INHIBITING PRINTOUT
4391  025236  001052                          BNE     CKERROR         ;BRANCH AROUND PRINTOUT IF SET
4392  025240  005737  001260                  TST     ERFLG           ;TEST FLAG TO PRINT HEADING
4393  025244  001004                          BNE     CKNOHD          ;BRANCH IF ALREADY DONE
4394  025246  005237  001260                  INC     ERFLG           ;PRINT HEADING ONCE ONLY
4395  025252  104400  033372                  TYPE,   MSG19           ;OUTPUT HEADING
4396  025256  104400  030251          CKNOHD: TYPE,   CRLF            ;OUTPUT CARRIAGE RETURN, LINEFEED
4397  025262  005237  015300                  INC     CLCNT           ;STEP UP COLUMN COUNT FOR ERROR REPORT
4398  025266  013746  015300                  MOV     CLCNT,-(SP)     ;PRINT THE COLUMN OF THE CARD
4399  025272  104404                          TYPDS                   ;ON WHICH AN ERROR WAS DETECTED
4400  025274  104400  030243                  TYPE,   SPACE
4401  025300  005337  015300                  DEC     CLCNT           ;DROP COLUMN COUNT BACK AFTER REPORTING
4402  025304  005737  025440                  TST     DERFLG
4403  025310  100007                          BPL     CKNOPK
4404  025312  104400  030243                  TYPE,   SPACE
4405  025316  114046                          MOVB    -(R0),-(SP)     ;PRINT THE INCORRECT VALUE
4406  025320  104402                          TYPOS                   ;THAT WAS READ FROM THE
4407  025322     003                          .BYTE   3               ;COLUMN INDICATED ABOVE
4408  025323     000                          .BYTE   0               ;(PACKED MODE)
4409  025324  105720                          TSTB    (R0)+           ;CORRECT MEMORY LOCATION AFTER PRINTOUT
4410  025326  000404                          BR      CKOVR1
4411  025330  014046          CKNOPK: MOV     -(R0),-(SP)     ;PRINT THE INCORRECT VALUE THAT
4412  025332  104402                          TYPOS                   ;WAS READ FROM THE COLUMN
4413  025334     006                          .BYTE   6               ;INDICATED ABOVE
4414  025335     001                          .BYTE   1               ;(IMAGE MODE)
4415  025336  005720                          TST     (R0)+           ;CORRECT THE MEMORY LOCATION AFTER PRINTOUT
4416  025340  104400  030243          CKOVR1: TYPE,   SPACE
4417  025344  013746  025432                  MOV     TOTCRD,-(SP)    ;PRINT THE CARD NUMBER ON WHICH
4418  025350  104404                          TYPDS                   ;THE ERROR WAS FOUND
4419  025352  104400  030243                  TYPE,   SPACE
4420  025356  013746  025430                  MOV     TOTERR,-(SP)    ;PRINT THE TOTAL NUMBER OF ERRORS
4421  025362  104404                          TYPDS                   ;ACCUMULATED TO NOW
4422  025364  005777  153546          CKERROR:        TST     @SWR            ;CHECK SW15 TO HALT ON ERROR
4423  025370  100001                          BPL     1$              ;BRANCH IF NOT SET
4424  025372  000000                          HALT                    ;HALT ON ERROR
```

```
4425  025374  005237  015300          1$:     INC     CLCNT           ;STEP UP COLUMN COUNT TO BE CORRECT FOR
4426                                                                  ;NEXT POSSIBLE COLUMN TO BE CHECKED
4427  025400  023727  015300  000120          CMP     CLCNT,#120      ;HAVE WE FINISHED A CARD?
4428  025406  001002                          BNE     2$              ;BRANCH IF NO
4429  025410  000137  024770                  JMP     CKLOOP          ;OTHERWISE, GO TO SET UP FOR NEXT CARD
4430  025414  032777  000004  153514  2$:     BIT     #4,@SWR         ;ARE WE DOING PACKED MODE?
4431  025422  001233                          BNE     CKLOP2          ;BRANCH IF NOT
4432  025424  000137  025066                  JMP     CKLOP3          ;OTHERWISE, CONTINUE CHECKING COLUMNS
4433                                                                  ;IN PACKED MODE
4434
4435  025430  000000                  TOTERR: 0
4436  025432  000000                  TOTCRD: 0
4437  025434  000000                  CARDIM: 0
4438  025436     000                  CDPK0:  .BYTE   0
4439  025437     000                  CDPK1:  .BYTE   0
4440  025440  000000                  DERFLG: 0
```

```
                                        ;ISSUE MESSAGE IF CARD READER IS OFF-LINE
                                        ;WAIT FOR BUSY TO CLEAR IN CASE CARD READER IS STILL READING A CARD
                                        ;INITIALIZE STATUS REGISTER AND USE ERROR HALT IF IT DOESN'T CLEAR PROPERLY
                                        ;NOTE THAT PROGRAM WILL HANG HERE IF BUSY REMAINS SET
025442  004737  025470          INIT:   JSR     PC,     CKOFFL  ;SEE IF OFF-LINE BIT IS SET
025446  105713                  1$:     TSTB    @CDS            ;WAIT FOR CONTROLLER READY, IN CASE
025450  100376                          BPL     1$              ;A CARD IS STILL BEING READ
025452  012713  000400                  MOV     #400,   @CDS    ;INITIALIZE THE CARD READER
025456  022713  000200                  CMP     #200,   @CDS    ;MAKE SURE INITIALIZATION OK
025462  001401                          BEQ     2$              ;BRANCH IF ALL BITS ZERO
025464  104067                          ERROR +67               ;NOT ALL BITS OF STATUS REGISTER ARE ZERO
025466  000207                  2$:     RTS     PC              ;RETURN

                                        ;SUBROUTINE TO CHECK FOR BIT 12 (OFF-LINE) BEING SET IN CARD
                                        ;READER CSR, AND PRINT OUT A MESSAGE IF IT IS
025470  032713  010000          CKOFFL: BIT     #10000, @CDS    ;CHECK BIT 12
025474  001001                          BNE     1$              ;BRANCH IF SET
025476  000207                          RTS     PC              ;RETURN IF NOT SET
025500  104400  033340          1$:     TYPE,   MSG18           ;"CARD READER OFF-LINE"
025504  104400  033125                  TYPE,   MSG17           ;"REMEDY THE CONDITION ... ETC."
025510  000000                          HALT                    ;WAIT FOR CONTINUE
025512  000766                          BR      CKOFFL          ;CHECK AGAIN


                                        ;******************************************************************

                                        .SBTTL  ERROR MESSAGE TYPEOUT ROUTINE

                                        ;*THIS ROUTINE USES THE "ITEM CONTROL BYTE" ($ITEMB) TO DETERMINE WHICH
                                        ;*ERROR IS TO BE REPORTED. IT THEN OBTAINS, FROM THE "ERROR TABLE" ($ERRTB),
                                        ;*AND REPORTS THE APPROPRIATE INFORMATION CONCERNING THE ERROR.

025514                          $ERRTYP:
025514  104400  001227                  TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
025520  010046                          MOV     R0,-(SP)        ;;SAVE R0
025522  005000                          CLR     R0              ;;PICKUP THE ITEM INDEX
025524  153700  001114                  BISB    @#$ITEMB,R0
025530  001004                          BNE     1$              ;;IF ITEM NUMBER IS ZERO, JUST
                                                                ;;TYPE THE PC OF THE ERROR
025532  013746  001116                  MOV     $ERRPC,-(SP)    ;;SAVE $ERRPC FOR TYPEOUT
                                                                ;;ERROR ADDRESS
025536  104401                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
025540  000426                          BR      6$              ;;GET OUT
025542  005300                  1$:     DEC     R0              ;;ADJUST THE INDEX SO THAT IT WILL
025544  006300                          ASL     R0              ;;      WORK FOR THE ERROR TABLE
025546  006300                          ASL     R0
025550  006300                          ASL     R0
025552  062700  001270                  ADD     #$ERRTB,R0      ;;FORM TABLE POINTER
025556  012037  025566                  MOV     (R0)+,2$        ;;PICKUP "ERROR MESSAGE" POINTER
025562  001404                          BEQ     3$              ;;SKIP TYPEOUT IF NO POINTER
025564  104400                          TYPE                    ;;TYPE THE "ERROR MESSAGE"
025566  000000                  2$:     .WORD   0               ;;"ERROR MESSAGE" POINTER GOES HERE
025570  104400  001227                  TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
```

```
4495  025574  012037  025604          3$:     MOV     (R0)+,4$        ;;PICKUP "DATA HEADER" POINTER
4496  025600  001404                          BEQ     5$              ;;SKIP TYPEOUT IF 0
4497  025602  104400                          TYPE                    ;;TYPE THE "DATA HEADER"
4498  025604  000000                  4$:     .WORD   0               ;;"DATA HEADER" POINTER GOES HERE
4499  025606  104400  001227                  TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
4500  025612  011000                  5$:     MOV     (R0),R0         ;;PICKUP "DATA TABLE" POINTER
4501  025614  001004                          BNE     7$              ;;GO TYPE THE DATA
4502  025616  012600                  6$:     MOV     (SP)+,R0        ;;RESTORE R0
4503  025620  104400  001227                  TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
4504  025624  000207                          RTS     PC              ;;RETURN
4505  025626                          7$:
4506  025626  013046                          MOV     @(R0)+,-(SP)    ;;SAVE @(R0)+ FOR TYPEOUT
4507  025630  104401                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
4508  025632  005710                          TST     (R0)            ;;IS THERE ANOTHER NUMBER?
4509  025634  001770                          BEQ     6$              ;;BR IF NO
4510  025636  104400  025644                  TYPE    ,8$             ;;TYPE TWO(2) SPACES
4511  025642  000771                          BR      7$              ;;LOOP
4512  025644  020040     000          8$:     .ASCIZ  /  /            ;;TWO(2) SPACES
4513          025650                          .EVEN
4514
4515                                  ;*******************************************************************
4516
4517                                  .SBTTL  ERROR HANDLER ROUTINE
4518
4519                                  ;*THIS ROUTINE WILL INCREMENT THE EPROR FLAG AND THE ERROR COUNT,
4520                                  ;*SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
4521                                  ;*AND GO TO $ERRTYP ON ERROR
4522                                  ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
4523                                  ;*SW15=1         HALT ON ERROR
4524                                  ;*SW13=1         INHIBIT ERROR TYPEOUTS
4525                                  ;*SW10=1         BELL ON ERROR
4526                                  ;*CALL
4527                                  ;*      ERROR   N       ;;ERROR=EMT AND N=ERROR ITEM NUMBER
4528
4529  025650                          $ERROR:
4530  025650  010637  001174                  MOV     SP,$REG6        ;STACK POINTER POSITION
4531  025654  016637  000002  001176          MOV     2(SP),$REG7     ;CONTENTS OF 'PSW'
4532  025662  011337  001200                  MOV     @CDS,$TMP0      ;CONTENTS OF DEVICE 'CDS'
4533  025666  017737  153346  001202          MOV     @CDDB,$TMP1     ;CONTENTS OF DEVICE 'CDD'
4534  025674  011437  001204                  MOV     @CDC,$TMP2      ;CONTENTS OF DEVICE 'CDC'
4535  025700  011537  001206                  MOV     @CDA,$TMP3      ;CONTENTS OF DEVICE 'CDA'
4536  025704  105237  001103          7$:     INCB    $ERFLG          ;;SET THE ERROR FLAG
4537  025710  001775                          BEQ     7$              ;;DON'T LET THE FLAG GO TO ZERO
4538  025712  013777  001102  153220          MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER AND ERROR FLAG
4539  025720  032777  002000  153210          BIT     #BIT10,@SWR     ;;BELL ON ERROR?
4540  025726  001402                          BEQ     1$              ;;NO - SKIP
4541  025730  104400  001222                  TYPE    ,$BELL          ;;RING BELL
4542  025734  005237  001112          1$:     INC     $ERTTL          ;;COUNT THE NUMBER OF ERRORS
4543  025740  011637  001116                  MOV     (SP),$ERRPC     ;;GET ADDRESS OF ERROR INSTRUCTION
4544  025744  162737  000002  001116          SUB     #2,$ERRPC
4545  025752  117737  153140  001114          MOVB    @$ERRPC,$ITEMB  ;;STRIP AND SAVE THE ERROR ITEM CODE
4546  025760  032777  020000  153150          BIT     #BIT13,@SWR     ;;SKIP TYPEOUT IF SET
4547  025766  001004                          BNE     20$             ;;SKIP TYPEOUTS
4548  025770  004737  025514                  JSR     PC,$ERRTYP      ;;GO TO USER ERROR ROUTINE
```

```
 4549  025774  104400  001227                  TYPE    ,$CRLF
 4550  026000                          20$:
 4551  026000  005777  153132          2$:     TST     @SWR            ;;HALT ON ERROR
 4552  026004  100006                          BPL     3$              ;;SKIP IF CONTINUE
 4553  026006  000000                          HALT                    ;;HALT ON ERROR!
 4554  026010  022737  015012  000042          CMP     #SENDAD,@#42    ;;ACT-11 AUTO-ACCEPT?
 4555  026016  001001                          BNE     3$              ;;BRANCH IF NO
 4556  026020  000000                          HALT                    ;;YES
 4557  026022                          3$:
 4558  026022  000002                          RTI                     ;;RETURN
 4559
 4560                                  ;*****************************************************************
 4561
 4562                                  .SBTTL  SCOPE HANDLER ROUTINE
 4563
 4564                                  ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
 4565                                  ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
 4566                                  ;*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
 4567                                  ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
 4568                                  ;*SW14=1        LOOP ON TEST
 4569                                  ;*SW11=1        INHIBIT ITERATIONS
 4570                                  ;*CALL
 4571                                  ;*      SCOPE           ;;SCOPE=IOT
 4572
 4573  026024                          $SCOPE:
 4574  026024  032777  040000  153104  1$:     BIT     #BIT14,@SWR     ;;LOOP ON PRESENT TEST?
 4575  026032  001055                          BNE     $OVER           ;;YES IF SW14=1
 4576                                  ;*****START OF CODE FOR THE XOR TESTER*****
 4577  026034  000416                  $XTSTR: BR      6$              ;;IF RUNNING ON THE "XOR" TESTER CHANGE
 4578                                                                  ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
 4579  026036  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE THE CONTENTS OF THE ERROR VECTOR
 4580  026042  012737  026062  000004          MOV     #5$,@#ERRVEC    ;;SET FOR TIMEOUT
 4581  026050  005737  177060                  TST     @#177060        ;;TIME OUT ON XOR?
 4582  026054  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
 4583  026060  000436                          BR      $SVLAD          ;;GO TO THE NEXT TEST
 4584  026062  022626                  5$:     CMP     (SP)+,(SP)+     ;;CLEAR THE STACK AFTER A TIME OUT
 4585  026064  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
 4586  026070  000436                          BR      $OVER           ;;LOOP ON THE PRESENT TEST
 4587  026072                          6$:;*****END OF CODE FOR THE XOR TESTER*****
 4588  026072  105737  001103          2$:     TSTB    $ERFLG          ;;WAS AN ERROR OCCURRED?
 4589  026076  001404                          BEQ     3$              ;;BR IF NO
 4590  026100  105037  001103          4$:     CLRB    $ERFLG          ;;ZERO THE ERROR FLAG
 4591  026104  005037  001220                  CLR     $TIMES          ;;CLEAR THE NUMBER OF ITERATIONS TO MAKE
 4592  026110  032777  004000  153020  3$:     BIT     #BIT11,@SWR     ;;INHIBIT ITERATIONS?
 4593  026116  001011                          BNE     1$              ;;BR IF YES
 4594  026120  005737  001100                  TST     $PASS           ;;IF FIRST PASS OF PROGRAM
 4595  026124  001406                          BEQ     1$              ;;      INHIBIT ITERATIONS
 4596  026126  005237  001104                  INC     $ICNT           ;;INCREMENT ITERATION COUNT
 4597  026132  023737  001220  001104          CMP     $TIMES,$ICNT    ;;CHECK THE NUMBER OF ITERATIONS MADE
 4598  026140  002012                          BGE     $OVER           ;;BR IF MORE ITERATION REQUIRED
 4599  026142  012737  000001  001104  1$:     MOV     #1,$ICNT        ;;REINITIALIZE THE ITERATION COUNTER
 4600  026150  013737  026202  001220          MOV     $MXCNT,$TIMES   ;;SET NUMBER OF ITERATIONS TO DO
 4601  026156  105237  001102          $SVLAD: INCB    $TSTNM          ;;COUNT TEST NUMBERS
 4602  026162  011637  001106                  MOV     (SP),$LPADR     ;;SAVE SCOPE LOOP ADDRESS
```

```
4603  026166  013777  001102  152744  $OVER:  MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER
4604  026174  013716  001106          MOV     $LPADR,(SP)     ;;FUDGE RETURN ADDRESS
4605  026200  000002                  RTI                     ;;FIXES PS
4606  026202  000001                  $MXCNT: 1               ;;MAX. NUMBER OF ITERATIONS
4607
4608                                   ;*****************************************************************
4609
4610                                   .SBTTL  TYPE ROUTINE
4611
4612                                   ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
4613                                   ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
4614                                   ;*NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
4615                                   ;*NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
4616                                   ;*NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
4617                                   ;*
4618                                   ;*CALL:
4619                                   ;*1) USING A TRAP INSTRUCTION
4620                                   ;*      TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
4621                                   ;*OR
4622                                   ;*      TYPE
4623                                   ;*      MESADR
4624                                   ;*
4625
4626  026204  105737  001155  $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
4627  026210  100002                  BPL     1$              ;;BR IF YES
4628  026212  000000                  HALT                    ;;HALT HERE IF NO TERMINAL
4629  026214  000407                  BR      3$              ;;LEAVE
4630  026216  010046          1$:     MOV     R0,-(SP)        ;;SAVE R0
4631  026220  017600  000002          MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
4632  026224  112046          2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
4633  026226  001005                  BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
4634  026230  005726                  TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
4635  026232  012600          60$:    MOV     (SP)+,R0        ;;RESTORE R0
4636  026234  062716  000002  3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
4637  026240  000002                  RTI                     ;;RETURN
4638  026242  122716  000011  4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
4639  026246  001426                  BEQ     8$
4640  026250  122716  000200          CMPB    #TCRLF,(SP)     ;;BRANCH IF NOT <CRLF>
4641  026254  001004                  BNE     5$
4642  026256  005726                  TST     (SP)+           ;;POP  <CR><LF> EQUIV
4643  026260  104400                  TYPE                    ;;TYPE A CR AND LF
4644  026262  001227                  $CRLF
4645  026264  000757                  BR      2$              ;;GET NEXT CHARACTER
4646  026266  004737  026350  5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
4647  026272  123726  001154  6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
4648  026276  001352                  BNE     2$              ;;IF NO GO GET NEXT CHAR.
4649  026300  013746  001152          MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
4650                                                          ;;AND THE NULL CHAR.
4651  026304  105366  000001  7$:     DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
4652  026310  002770                  BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
4653  026312  004737  026350          JSR     PC,$TYPEC       ;;GO TYPE A NULL
4654  026316  105337  026414          DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
4655  026322  000770                  BR      7$              ;;LOOP
4656
```

```
4657                                    ;HORIZONTAL TAB PROCESSOR
4658
4659  026324  112716  000040            8$:     MOVB    #40,(SP)        ;;REPLACE TAB WITH SPACE
4660  026330  004737  026350            9$:     JSR     PC,$TYPEC       ;;TYPE A SPACE
4661  026334  132737  000007  026414            BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
4662  026342  001372                            BNE     9$              ;;TAB STOP
4663  026344  005726                            TST     (SP)+           ;;POP SPACE OFF STACK
4664  026346  000726                            BR      2$              ;;GET NEXT CHARACTER
4665  026350  105777  152572          $TYPEC: TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
4666  026354  100375                            BPL     $TYPEC
4667  026356  116677  000002  152564            MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
4668  026364  122766  000015  000002            CMPB    #15,2(SP)       ;;BRANCH IF
4669  026372  001003                            BNE     1$              ;;NOT <CR>
4670  026374  105037  026414                    CLRB    $CHARCNT        ;;
4671  026400  000406                            BR      $TYPEX          ;;EXIT
4672  026402  122766  000012  000002  1$:       CMPB    #12,2(SP)       ;;BRANCH IF
4673  026410  002002                            BGE     $TYPEX          ;;<LF>
4674  026412  105227                            INCB    (PC)+           ;;INC SPACE
4675  026414  000000                    $CHARCNT:.WORD  0               ;;COUNT
4676  026416  000207                    $TYPEX: RTS     PC
4677                                    ;;      EQUATES
4678          000011                    TAT=11
4679          000200                    TCRLF=200
4680
4681
4682                                    ;*******************************************************************
4683
4684                                    .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
4685
4686                                    ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
4687                                    ;*OCTAL (ASCII) NUMBER AND TYPE IT.
4688                                    ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
4689                                    ;*CALL:
4690                                    ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
4691                                    ;*      TYPOS                   ;;CALL FOR TYPEOUT
4692                                    ;*      .BYTE   N               ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
4693                                    ;*      .BYTE   M               ;;M=1 OR 0
4694                                    ;*                                      ;;1=TYPE LEADING ZEROS
4695                                    ;*                                      ;;0=SUPPRESS LEADING ZEROS
4696                                    ;*
4697                                    ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
4698                                    ;*$TYPOS OR $TYPOC
4699                                    ;*CALL:
4700                                    ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
4701                                    ;*      TYPON                   ;;CALL FOR TYPEOUT
4702                                    ;*
4703                                    ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
4704                                    ;*CALL:
4705                                    ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
4706                                    ;*      TYPOC                   ;;CALL FOR TYPEOUT
4707
4708  026420  017646  000000            $TYPOS: MOV     @(SP),-(SP)     ;;PICKUP THE MODE
4709  026424  116637  000001  026643            MOVB    1(SP),$OFILL    ;;LOAD ZERO FILL SWITCH
4710  026432  112637  026645                    MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE
```

```
4711  026436  062716  000002                    ADD     #2,(SP)         ;;ADJUST RETURN ADDRESS
4712  026442  000406                            BR      $TYPON
4713  026444  112737  000001  026643  $TYPOC:   MOVB    #1,$OFILL       ;;SET THE ZERO FILL SWITCH
4714  026452  112737  000006  026645            MOVB    #6,$OMODE+1     ;;SET FOR SIX(6) DIGITS
4715  026460  112737  000005  026642  $TYPON:   MOVB    #5,$OCNT        ;;SET THE ITERATION COUNT
4716  026466  010346                            MOV     R3,-(SP)        ;;SAVE R3
4717  026470  010446                            MOV     R4,-(SP)        ;;SAVE R4
4718  026472  010546                            MOV     R5,-(SP)        ;;SAVE R5
4719  026474  113704  026645                    MOVB    $OMODE+1,R4     ;;GET THE NUMBER OF DIGITS TO TYPE
4720  026500  005404                            NEG     R4
4721  026502  062704  000006                    ADD     #6,R4           ;;SUBTRACT IT FROM MAX. ALLOWED
4722  026506  110437  026644                    MOVB    R4,$OMODE       ;;SAVE IT FOR USE
4723  026512  113704  026643                    MOVB    $OFILL,R4       ;;GET THE ZERO FILL SWITCH
4724  026516  016605  000012                    MOV     12(SP),R5       ;;PICKUP THE INPUT NUMBER
4725  026522  005003                            CLR     R3              ;;CLEAR THE OUTPUT WORD
4726  026524  006105                  1$:       ROL     R5              ;;ROTATE MSB INTO "C"
4727  026526  000404                            BR      3$              ;;GO DO MSB
4728  026530  006105                  2$:       ROL     R5              ;;FORM THIS DIGIT
4729  026532  006105                            ROL     R5
4730  026534  006105                            ROL     R5
4731  026536  010503                            MOV     R5,R3
4732  026540  006103                  3$:       ROL     R3              ;;GET LSB OF THIS DIGIT
4733  026542  105337  026644                    DECB    $OMODE          ;;TYPE THIS DIGIT?
4734  026546  100016                            BPL     7$              ;;BR IF NO
4735  026550  042703  177770                    BIC     #177770,R3      ;;GET RID OF JUNK
4736  026554  001002                            BNE     4$              ;;TEST FOR 0
4737  026556  005704                            TST     R4              ;;SUPPRESS THIS 0?
4738  026560  001403                            BEQ     5$              ;;BR IF YES
4739  026562  005204                  4$:       INC     R4              ;;DON'T SUPPRESS ANYMORE 0'S
4740  026564  052703  000060                    BIS     #'0,R3          ;;MAKE THIS DIGIT ASCII
4741  026570  052703  000040          5$:       BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
4742  026574  110337  026640                    MOVB    R3,8$           ;;SAVE FOR TYPING
4743  026600  104400  026640                    TYPE    ,8$             ;;GO TYPE THIS DIGIT
4744  026604  105337  026642          7$:       DECB    $OCNT           ;;COUNT BY 1
4745  026610  003347                            BGT     2$              ;;BR IF MORE TO DO
4746  026612  002402                            BLT     6$              ;;BR IF DONE
4747  026614  005204                            INC     R4              ;;INSURE LAST DIGIT ISN'T A BLANK
4748  026616  000744                            BR      2$              ;;GO DO THE LAST DIGIT
4749  026620  012605                  6$:       MOV     (SP)+,R5        ;;RESTORE R5
4750  026622  012604                            MOV     (SP)+,R4        ;;RESTORE R4
4751  026624  012603                            MOV     (SP)+,R3        ;;RESTORE R3
4752  026626  016666  000002  000004            MOV     2(SP),4(SP)     ;;SET THE STACK FOR RETURNING
4753  026634  012616                            MOV     (SP)+,(SP)
4754  026636  000002                            RTI                     ;;RETURN
4755  026640     000          8$:       .BYTE   0               ;;STORAGE FOR ASCII DIGIT
4756  026641     000                    .BYTE   0               ;;TERMINATOR FOR TYPE ROUTINE
4757  026642     000          $OCNT:    .BYTE   0               ;;OCTAL DIGIT COUNTER
4758  026643     000          $OFILL:   .BYTE   0               ;;ZERO FILL SWITCH
4759  026644  000000          $OMODE:   .WORD   0               ;;NUMBER OF DIGITS TO TYPE
4760
4761                          ;******************************************************************
4762
4763                          .SBTTL  CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
4764
```

```
                                        ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 5-DIGIT
                                        ;*SIGNED DECIMAL (ASCII) NUMBER AND TYPE IT. DEPENDING ON WHETHER THE
                                        ;*NUMBER IS POSITIVE OR NEGATIVE A SPACE OR A MINUS SIGN WILL BE TYPED
                                        ;*BEFORE THE FIRST DIGIT OF THE NUMBER. LEADING ZEROS WILL ALWAYS BE
                                        ;*REPLACED WITH SPACES.
                                        ;*CALL:
                                        ;*      MOV     NUM,-(SP)       ;;PUT THE BINARY NUMBER ON THE STACK
                                        ;*      TYPDS                   ;;GO TO THE ROUTINE
                                        $TYPDS:
026646 010046                           MOV     R0,-(SP)        ;;PUSH R0 ON STACK
026650 010146                           MOV     R1,-(SP)        ;;PUSH R1 ON STACK
026652 010246                           MOV     R2,-(SP)        ;;PUSH R2 ON STACK
026654 010346                           MOV     R3,-(SP)        ;;PUSH R3 ON STACK
026656 010546                           MOV     R5,-(SP)        ;;PUSH R5 ON STACK
026660 012746 020200                    MOV     #20200,-(SP)    ;;SET BLANK SWITCH AND SIGN
026664 016605 000020                    MOV     20(SP),R5       ;;GET THE INPUT NUMBER
026670 100004                           BPL     1$              ;;BR IF INPUT IS POS.
026672 005405                           NEG     R5              ;;MAKE THE BINARY NUMBER POS.
026674 112766 000055 000001             MOVB    #'-,1(SP)       ;;MAKE THE ASCII NUMBER NEG.
026702 005000                    1$:    CLR     R0              ;;ZERO THE CONSTANTS INDEX
026704 012703 027062                    MOV     #$DBLK,R3       ;;SETUP THE OUTPUT POINTER
026710 112723 000040                    MOVB    #' ,(R3)+       ;;SET THE FIRST CHARACTER TO A BLANK
026714 005002                    2$:    CLR     R2              ;;CLEAR THE BCD NUMBER
026716 016001 027052                    MOV     $DTBL(R0),R1    ;;GET THE CONSTANT
026722 160105                    3$:    SUB     R1,R5           ;;FORM THIS BCD DIGIT
026724 002402                           BLT     4$              ;;BR IF DONE
026726 005202                           INC     R2              ;;INCREASE THE BCD DIGIT BY 1
026730 000774                           BR      3$
026732 060105                    4$:    ADD     R1,R5           ;;ADD BACK THE CONSTANT
026734 005702                           TST     R2              ;;CHECK IF BCD DIGIT=0
026736 001002                           BNE     5$              ;;FALL THROUGH IF 0
026740 105716                           TSTB    (SP)            ;;STILL DOING LEADING 0'S?
026742 100407                           BMI     7$              ;;BR IF YES
026744 106316                    5$:    ASLB    (SP)            ;;MSD?
026746 103003                           BCC     6$              ;;BR IF NO
026750 116663 000001 177777             MOVB    1(SP),-1(R3)    ;;YES--SET THE SIGN
026756 052702 000060             6$:    BIS     #'0,R2          ;;MAKE THE BCD DIGIT ASCII
026762 052702 000040             7$:    BIS     #' ,R2          ;;MAKE IT A SPACE IF NOT ALREADY A DIGIT
026766 110223                           MOVB    R2,(R3)+        ;;PUT THIS CHARACTER IN THE OUTPUT BUFFER
026770 005720                           TST     (R0)+           ;;JUST INCREMENTING
026772 020027 000010                    CMP     R0,#10          ;;CHECK THE TABLE INDEX
026776 002746                           BLT     2$              ;;GO DO THE NEXT DIGIT
027000 003002                           BGT     8$              ;;GO TO EXIT
027002 010502                           MOV     R5,R2           ;;GET THE LSD
027004 000764                           BR      6$              ;;GO CHANGE TO ASCII
027006 105726                    8$:    TSTB    (SP)+           ;;WAS THE LSD THE FIRST NON-ZERO?
027010 100003                           BPL     9$              ;;BR IF NO
027012 116663 177777 177776             MOVB    -1(SP),-2(R3)   ;;YES--SET THE SIGN FOR TYPING
027020 105013                    9$:    CLRB    (R3)            ;;SET THE TERMINATOR
027022 012605                           MOV     (SP)+,R5        ;;POP STACK INTO R5
027024 012603                           MOV     (SP)+,R3        ;;POP STACK INTO R3
027026 012602                           MOV     (SP)+,R2        ;;POP STACK INTO R2
027030 012601                           MOV     (SP)+,R1        ;;POP STACK INTO R1
```

```
 4819  027032  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
 4820  027034  104400  027062                  TYPE    $DBLK           ;;NOW TYPE THE NUMBER
 4821  027040  016666  000002  000004          MOV     2(SP),4(SP)     ;;ADJUST THE STACK
 4822  027046  012616                          MOV     (SP)+,(SP)
 4823  027050  000002                          RTI                     ;;RETURN TO USER
 4824  027052  023420                $DTBL:    10000.
 4825  027054  001750                          1000.
 4826  027056  000144                          100.
 4827  027060  000012                          10.
 4828  027062  000004                $DBLK:    .BLKW   4
 4829
 4830                                ;*****************************************************************
 4831
 4832                                .SBTTL  TRAP DECODER
 4833
 4834                                ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
 4835                                ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
 4836                                ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
 4837                                ;*GO TO THAT ROUTINE.
 4838
 4839  027072  010046                $TRAP:    MOV     R0,-(SP)        ;;SAVE R0
 4840  027074  016600  000002                  MOV     2(SP),R0        ;;GET TRAP ADDRESS
 4841  027100  005740                          TST     -(R0)           ;;BACKUP BY 2
 4842  027102  111000                          MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
 4843  027104  006300                          ASL     R0              ;;POSITION FOR INDEXING
 4844  027106  016000  027114                  MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
 4845  027112  000200                          RTS     R0              ;;GO TO ROUTINE
 4846
 4847
 4848                                .SBTTL  TRAP TABLE
 4849
 4950                                ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
 4851                                ;*BY THE "TRAP" INSTRUCTION.
 4952
 4853                                ;       ROUTINE
 4854                                ;       -------
 4855  027114                        $TRPAD:
 4856  027114  026204                          $TYPE   ;;CALL=TYPE     TRAP+0(104400)  TTY TYPEOUT ROUTINE
 4857  027116  026444                          $TYPOC  ;;CALL=TYPOC    TRAP+1(104401)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
 4858  027120  026420                          $TYPOS  ;;CALL=TYPOS    TRAP+2(104402)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
 4859  027122  026460                          $TYPON  ;;CALL=TYPON    TRAP+3(104403)  TYPE OCTAL NUMBER (AS PER LAST CALL)
 4860  027124  026646                          $TYPDS  ;;CALL=TYPDS    TRAP+4(104404)  TYPE DECIMAL NUMBER (WITH SIGN)
 4861
 4862                                ;*****************************************************************
 4863
 4864                                .SBTTL  POWER DOWN AND UP ROUTINES
 4865
 4866                                ;POWER DOWN ROUTINE
 4867  027126  012737  027262  000024 $PWRDN:  MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST UP
 4868  027134  012737  000340  000026         MOV     #340,@#PWRVEC+2 ;;PRIO:7
 4869  027142  010046                         MOV     R0,-(SP)        ;;PUSH R0 ON STACK
 4870  027144  010146                         MOV     R1,-(SP)        ;;PUSH R1 ON STACK
 4871  027146  010246                         MOV     R2,-(SP)        ;;PUSH R2 ON STACK
 4872  027150  010346                         MOV     R3,-(SP)        ;;PUSH R3 ON STACK
```

```
4873  027152  010446                          MOV     R4,-(SP)          ;;PUSH R4 ON STACK
4874  027154  010546                          MOV     R5,-(SP)          ;;PUSH R5 ON STACK
4875  027156  010637  027266                  MOV     SP,$SAVR6         ;;SAVE SP
4876  027162  012737  027174  000024          MOV     #$PWRUP,@#PWRVEC  ;;SET UP VECTOR
4877  027170  000000                          HALT
4878  027172  000776                          BR      .-2               ;;HANG UP
4879
4880                                  ;POWER UP ROUTINE
4881  027174  013706  027266          $PWRUP: MOV     $SAVR6,SP         ;;GET SP
4882  027200  005037  027266                  CLR     $SAVR6            ;;WAIT LOOP FOR THE TTY
4883  027204  005237  027266          1$:     INC     $SAVR6            ;;WAIT FOR THE INC
4884  027210  001375                          BNE     1$                ;;OF  WORD
4885  027212  012605                          MOV     (SP)+,R5          ;;POP STACK INTO R5
4886  027214  012604                          MOV     (SP)+,R4          ;;POP STACK INTO R4
4887  027216  012603                          MOV     (SP)+,R3          ;;POP STACK INTO R3
4888  027220  012602                          MOV     (SP)+,R2          ;;POP STACK INTO R2
4889  027222  012601                          MOV     (SP)+,R1          ;;POP STACK INTO R1
4890  027224  012600                          MOV     (SP)+,R0          ;;POP STACK INTO R0
4891  027226  012737  027126  000024          MOV     #$PWRDN,@#PWRVEC  ;;SET UP THE POWER DOWN VECTOR
4892  027234  012737  000340  000026          MOV     #340,@#PWRVEC+2   ;;PRIO:7
4893  027242  104400                          TYPE                      ;;REPORT THE POWER FAILURE
4894  027244  030622          $PWRMG: .WORD   POWMES                    ;;POWER FAIL MESSAGE POINTER
4895  027246  012716                          MOV     (PC)+,(SP)        ;;RESTART AT DISPATCH
4896  027250  027270          $PWRAD: .WORD   DISPATCH                  ;;RESTART ADDRESS
4897  027252  042766  000020  000002  BIC     #20,2(SP)                 ;;CLEAR "T" BIT
4898  027260  000002                          RTI
4899  027262  000000          $ILLUP: HALT                              ;;THE POWER UP SEQUENCE WAS STARTED
4900  027264  000776                          BR      .-2               ;; BEFORE THE POWER DOWN WAS COMPLETE
4901  027266  000000          $SAVR6: 0                                 ;;PUT THE SP HERE
4902
4903  027270  000177  000000  DISPATCH:       JMP     @RETURN           ;ATTEMPT TO RESTART LAST SECTION
4904                                          ;BEING RUN BEFORE POWER FAILURE
4905                                          ;OCCURRED
4906  027274  000000  RETURN:               .WORD   0                 ;THIS LOCATION HOLDS THE STARTING
4907                                          ;ADDRESS OF THE SECTION BEING RUN
4908                                          ;BEFORE THE POWER FAILURE OCCURRED
4909                                          ;EITHER:        BEGIN:
4910                                          ;               ERCD12:
4911                                          ;               XLOOP:
4912                                          ;               CKSAME:
4913
```

```
                                ;DATA TABLES FOR DATA RELIABILITY TESTS
                                ;
                                ;ALPHANUMERIC DECK DATA TABLE
                                ;CARD IMAGE FORM
                                ;                                COLUMN  ASCII   PUNCH
027276  004000                  ALPCD:  4000                    ;1      &       12
027300  014400                          14400                   ;2      A       12 1
027302  024200                          24200                   ;3      B       12 2
027304  034100                          34100                   ;4      C       12 3
027306  044040                          44040                   ;5      D       12 4
027310  054020                          54020                   ;6      E       12 5
027312  064010                          64010                   ;7      F       12 6
027314  074004                          74004                   ;8      G       12 7
027316  004002                          4002                    ;9      H       12 8
027320  004001                          4001                    ;10     I       12 9
027322  024202                          24202                   ;11     [       12 8 2
027324  034102                          34102                   ;12     .       12 8 3
027326  044042                          44042                   ;13     <       12 8 4
027330  054022                          54022                   ;14     (       12 8 5
027332  064012                          64012                   ;15     +       12 8 6
027334  074006                          74006                   ;16     !       12 8 7
027336  002000                          2000                    ;17     -       11
027340  012400                          12400                   ;18     J       11 1
027342  022200                          22200                   ;19     K       11 2
027344  032100                          32100                   ;20     L       11 3
027346  042040                          42040                   ;21     M       11 4
027350  052020                          52020                   ;22     N       11 5
027352  062010                          62010                   ;23     O       11 6
027354  072004                          72004                   ;24     P       11 7
027356  002002                          2002                    ;25     Q       11 8
027360  002001                          2001                    ;26     R       11 9
027362  022202                          22202                   ;27     ]       11 8 2
027364  032102                          32102                   ;28     $       11 8 3
027366  042042                          42042                   ;29     *       11 8 4
027370  052022                          52022                   ;30     )       11 8 5
027372  062012                          62012                   ;31     ;       11 8 6
027374  072006                          72006                   ;32     ^       11 8 7
027376  001000                          1000                    ;33     0       0
027400  011400                          11400                   ;34     /       0 1
027402  021200                          21200                   ;35     S       0 2
027404  031100                          31100                   ;36     T       0 3
027406  041040                          41040                   ;37     U       0 4
027410  051020                          51020                   ;38     V       0 5
027412  061010                          61010                   ;39     W       0 6
027414  071004                          71004                   ;40     X       0 7
027416  001002                          1002                    ;41     Y       0 8
027420  001001                          1001                    ;42     Z       0 9
027422  021202                          21202                   ;43     \       0 8 2
027424  031102                          31102                   ;44     ,       0 8 3
027426  041042                          41042                   ;45     %       0 8 4
027430  051022                          51022                   ;46     -       0 8 5
027432  061012                          61012                   ;47     >       0 8 6
027434  071006                          71006                   ;48     ?       0 8 7
```

```
 4968  027436  000000                    0000                    ;49     SPACE   BLANK
 4969  027440  010400                    10400                   ;50     1       1
 4970  027442  020200                    20200                   ;51     2       2
 4971  027444  030100                    30100                   ;52     3       3
 4972  027446  040040                    40040                   ;53     4       4
 4973  027450  050020                    50020                   ;54     5       5
 4974  027452  060010                    60010                   ;55     6       6
 4975  027454  070004                    70004                   ;56     7       7
 4976  027456  000002                    0002                    ;57     8       8
 4977  027460  000001                    0001                    ;58     9       9
 4978  027462  020202                    20202                   ;59     :       8 2
 4979  027464  030102                    30102                   ;60     ;       8 3
 4980  027466  040042                    40042                   ;61     @       8 4
 4981  027470  050022                    50022                   ;62     =       8 5
 4982  027472  060012                    60012                   ;63     :       8 6
 4983  027474  070006                    70006                   ;64     #       8 7
 4984  027476  004000                    4000                    ;65     &       12
 4985  027500  014400                    14400                   ;66     A       12 1
 4986  027502  024200                    24200                   ;67     B       12 2
 4987  027504  034100                    34100                   ;68     C       12 3
 4988  027506  044040                    44040                   ;69     D       12 4
 4989  027510  054020                    54020                   ;70     E       12 5
 4990  027512  064010                    64010                   ;71     F       12 6
 4991  027514  074004                    74004                   ;72     G       12 7
 4992  027516  004002                    4002                    ;73     H       12 8
 4993  027520  004001                    4001                    ;74     I       12 9
 4994  027522  024202                    24202                   ;75     [       12 8 2
 4995  027524  034102                    34102                   ;76     .       12 8 3
 4996  027526  044042                    44042                   ;77     <       12 8 4
 4997  027530  054022                    54022                   ;78     (       12 8 5
 4998  027532  064012                    64012                   ;79     +       12 8 6
 4999  027534  074006                    ALPEND: 74006           ;80     !       12 8 7
 5000
 5001                                    ;ALPHANUMERIC DECK DATA TABLE
 5002                                    ;THE VALUE IS THE ENCODED FORM OF THE DATA
 5003                                    .                               COLUMN  ASCII   PUNCH
 5004  027536      200                   ALPCDP: .BYTE   200             ;1      &       12
 5005  027537      201                           .BYTE   201             ;2      A       12 1
 5006  027540      202                           .BYTE   202             ;3      B       12 2
 5007  027541      203                           .BYTE   203             ;4      C       12 3
 5008  027542      204                           .BYTE   204             ;5      D       12 4
 5009  027543      205                           .BYTE   205             ;6      E       12 5
 5010  027544      206                           .BYTE   206             ;7      F       12 6
 5011  027545      207                           .BYTE   207             ;8      G       12 7
 5012  027546      210                           .BYTE   210             ;9      H       12 8
 5013  027547      220                           .BYTE   220             ;10     I       12 9
 5014  027550      212                           .BYTE   212             ;11     [       12 8 2
 5015  027551      213                           .BYTE   213             ;12     .       12 8 3
 5016  027552      214                           .BYTE   214             ;13     <       12 8 4
 5017  027553      215                           .BYTE   215             ;14     (       12 8 5
 5018  027554      216                           .BYTE   216             ;15     +       12 8 6
 5019  027555      217                           .BYTE   217             ;16     !       12 8 7
 5020  027556      100                           .BYTE   100             ;17     -       11
 5021  027557      101                           .BYTE   101             ;18     J       11 1
```

```
5022  027560  102                     .BYTE   102             ;19     K       11 2
5023  027561  103                     .BYTE   103             ;20     L       11 3
5024  027562  104                     .BYTE   104             ;21     M       11 4
5025  027563  105                     .BYTE   105             ;22     N       11 5
5026  027564  106                     .BYTE   106             ;23     O       11 6
5027  027565  107                     .BYTE   107             ;24     P       11 7
5028  027566  110                     .BYTE   110             ;25     Q       11 8
5029  027567  120                     .BYTE   120             ;26     R       11 9
5030  027570  112                     .BYTE   112             ;27     J       11 8 2
5031  027571  113                     .BYTE   113             ;28     $       11 8 3
5032  027572  114                     .BYTE   114             ;29     *       11 8 4
5033  027573  115                     .BYTE   115             ;30     )       11 8 5
5034  027574  116                     .BYTE   116             ;31     ;       11 8 6
5035  027575  117                     .BYTE   117             ;32     ^       11 8 7
5036  027576  040                     .BYTE   40              ;33     0       0
5037  027577  041                     .BYTE   41              ;34     /       0 1
5038  027600  042                     .BYTE   42              ;35     S       0 2
5039  027601  043                     .BYTE   43              ;36     T       0 3
5040  027602  044                     .BYTE   44              ;37     U       0 4
5041  027603  045                     .BYTE   45              ;38     V       0 5
5042  027604  046                     .BYTE   46              ;39     W       0 6
5043  027605  047                     .BYTE   47              ;40     X       0 7
5044  027606  050                     .BYTE   50              ;41     Y       0 8
5045  027607  060                     .BYTE   60              ;42     Z       0 9
5046  027610  052                     .BYTE   52              ;43     \       0 8 2
5047  027611  053                     .BYTE   53              ;44     ,       0 8 3
5048  027612  054                     .BYTE   54              ;45     %       0 8 4
5049  027613  055                     .BYTE   55              ;46     -       0 8 5
5050  027614  056                     .BYTE   56              ;47     .       0 8 6
5051  027615  057                     .BYTE   57              ;48     ?       0 8 7
5052  027616  000                     .BYTE   0               ;49     SPACE   BLANK
5053  027617  001                     .BYTE   1               ;50     1       1
5054  027620  002                     .BYTE   2               ;51     2       2
5055  027621  003                     .BYTE   3               ;52     3       3
5056  027622  004                     .BYTE   4               ;53     4       4
5057  027623  005                     .BYTE   5               ;54     5       5
5058  027624  006                     .BYTE   6               ;55     6       6
5059  027625  007                     .BYTE   7               ;56     7       7
5060  027626  010                     .BYTE   10              ;57     8       8
5061  027627  020                     .BYTE   20              ;58     9       9
5062  027630  012                     .BYTE   12              ;59     :       8 2
5063  027631  013                     .BYTE   13              ;60     #       8 3
5064  027632  014                     .BYTE   14              ;61     @       8 4
5065  027633  015                     .BYTE   15              ;62     =       8 5
5066  027634  016                     .BYTE   16              ;63     "       8 6
5067  027635  017                     .BYTE   17              ;64     !       8 7
5068  027636  200                     .BYTE   200             ;65     &       12
5069  027637  201                     .BYTE   201             ;66     A       12 1
5070  027640  202                     .BYTE   202             ;67     B       12 2
5071  027641  203                     .BYTE   203             ;68     C       12 3
5072  027642  204                     .BYTE   204             ;69     D       12 4
5073  027643  205                     .BYTE   205             ;70     E       12 5
5074  027644  206                     .BYTE   206             ;71     F       12 6
5075  027645  207                     .BYTE   207             ;72     G       12 7
```

```
5076  027646      210                     .BYTE   210             ;73     H       12 8
5077  027647      220                     .BYTE   220             ;74     I       12 9
5078  027650      212                     .BYTE   212             ;75     [       12 8 2
5079  027651      213                     .BYTE   213             ;76     .       12 8 3
5080  027652      214                     .BYTE   214             ;77     <       12 8 4
5081  027653      215                     .BYTE   215             ;78     (       12 8 5
5082  027654      216                     .BYTE   216             ;79     +       12 8 6
5083  027655      217           ALPENP:   .BYTE   217             ;80     !       12 8 7
5084
5085                              ;BINARY DECK DATA TABLE
5086                              ;                               COLUMN  PUNCH
5087  027656  000000              BINCD:  0                       ;1      BLANK
5088  027660  000001                      1                       ;2
5089  027662  000002                      2                       ;3
5090  027664  070004                      70004                   ;4
5091  027666  060010                      60010                   ;5
5092  027670  050020                      50020                   ;6
5093  027672  040040                      40040                   ;7
5094  027674  030100                      30100                   ;8
5095  027676  020200                      20200                   ;9
5096  027700  010400                      10400                   ;10
5097  027702  001000                      1000                    ;11
5098  027704  002000                      2000                    ;12
5099  027706  004000                      4000                    ;13
5100  027710  171111                      171111                  ;14
5101  027712  172222                      172222                  ;15
5102  027714  173333                      173333                  ;16
5103  027716  174444                      174444                  ;17
5104  027720  175555                      175555                  ;18
5105  027722  176666                      176666                  ;19
5106  027724  177777                      177777                  ;20
5107  027726  061010                      61010                   ;21
5108  027730  161212                      161212                  ;22
5109  027732  171313                      171313                  ;23
5110  027734  171414                      171414                  ;24
5111  027736  171515                      171515                  ;25
5112  027740  171616                      171616                  ;26
5113  027742  171717                      171717                  ;27
5114  027744  052020                      52020                   ;28
5115  027746  172121                      172121                  ;29
5116  027750  172323                      172323                  ;30
5117  027752  172424                      172424                  ;31
5118  027754  172525                      172525                  ;32
5119  027756  172626                      172626                  ;33
5120  027760  172727                      172727                  ;34
5121  027762  173030                      173030                  ;35
5122  027764  173131                      173131                  ;36
5123  027766  173232                      173232                  ;37
5124  027770  173434                      173434                  ;38
5125  027772  173535                      173535                  ;39
5126  027774  173636                      173636                  ;40
5127  027776  173737                      173737                  ;41
5128  030000  044040                      44040                   ;42
5129  030002  174141                      174141                  ;43
```

```
5130  030004  164242                    164242                  ;44
5131  030006  174343                    174343                  ;45
5132  030010  174545                    174545                  ;46
5133  030012  174646                    174646                  ;47
5134  030014  174747                    174747                  ;48
5135  030016  165050                    165050                  ;49
5136  030020  175151                    175151                  ;50
5137  030022  165252                    165252                  ;51
5138  030024  175353                    175353                  ;52
5139  030026  175454                    175454                  ;53
5140  030030  175656                    175656                  ;54
5141  030032  175757                    175757                  ;55
5142  030034  156060                    156060                  ;56
5143  030036  176161                    176161                  ;57
5144  030040  176262                    176262                  ;58
5145  030042  176363                    176363                  ;59
5146  030044  176464                    176464                  ;60
5147  030046  176565                    176565                  ;61
5148  030050  176767                    176767                  ;62
5149  030052  177070                    177070                  ;63
5150  030054  177171                    177171                  ;64
5151  030056  177272                    177272                  ;65
5152  030060  177373                    177373                  ;66
5153  030062  177474                    177474                  ;67
5154  030064  177575                    177575                  ;68
5155  030066  177676                    177676                  ;69
5156  030070  030101                    30101                   ;70
5157  030072  020202                    20202                   ;71
5158  030074  130303                    130303                  ;72
5159  030076  170404                    170404                  ;73
5160  030100  170505                    170505                  ;74
5161  030102  170606                    170606                  ;75
5162  030104  170707                    170707                  ;76
5163  030106  163210                    163210                  ;77
5164  030110  170123                    170123                  ;78
5165  030112  177654                    177654                  ;79
5166  030114  174567          BINEND:   174567                  ;80
5167
5168                          ;BINARY DECK DATA TABLE
5169                          ;THE VALUE IS THE ENCODED VALUE, WHICH ORS THE OCTAL REPRESENTATION OF
5170                          ;ROWS ONE THRU SEVEN
5171                          ;                                 COLUMN  ASCII   PUNCH
5172  030116     000          BINCDP:   .BYTE   0               ;1      SPACE   BLANK
5173  030117     020                    .BYTE   20              ;2      9       9
5174  030120     010                    .BYTE   10              ;3      8       8
5175  030121     007                    .BYTE   7               ;4      7       7
5176  030122     006                    .BYTE   6               ;5      6       6
5177  030123     005                    .BYTE   5               ;6      5       5
5178  030124     004                    .BYTE   4               ;7      4       4
5179  030125     003                    .BYTE   3               ;8      3       3
5180  030126     002                    .BYTE   2               ;9      2       2
5181  030127     001                    .BYTE   1               ;10     1       1
5182  030130     040                    .BYTE   40              ;11     0       0
5183  030131     100                    .BYTE   100             ;12     -       11
```

```
 5184  030132  200                    .BYTE   200             ;13     8       12
 5185  030133  067                    .BYTE   67              ;14
 5186  030134  117                    .BYTE   117             ;15
 5187  030135  177                    .BYTE   177             ;16
 5188  030136  207                    .BYTE   207             ;17
 5189  030137  267                    .BYTE   267             ;18
 5190  030140  317                    .BYTE   317             ;19
 5191  030141  377                    .BYTE   377             ;20
 5192  030142  046                    .BYTE   46              ;21
 5193  030143  056                    .BYTE   56              ;22
 5194  030144  077                    .BYTE   77              ;23
 5195  030145  047                    .BYTE   47              ;24
 5196  030146  067                    .BYTE   67              ;25
 5197  030147  057                    .BYTE   57              ;26
 5198  030150  077                    .BYTE   77              ;27
 5199  030151  105                    .BYTE   105             ;28
 5200  030152  127                    .BYTE   127             ;29
 5201  030153  137                    .BYTE   137             ;30
 5202  030154  107                    .BYTE   107             ;31
 5203  030155  127                    .BYTE   127             ;32
 5204  030156  117                    .BYTE   117             ;33
 5205  030157  137                    .BYTE   137             ;34
 5206  030160  147                    .BYTE   147             ;35
 5207  030161  167                    .BYTE   167             ;36
 5208  030162  157                    .BYTE   157             ;37
 5209  030163  147                    .BYTE   147             ;38
 5210  030164  167                    .BYTE   167             ;39
 5211  030165  157                    .BYTE   157             ;40
 5212  030166  177                    .BYTE   177             ;41
 5213  030167  204                    .BYTE   204             ;42
 5214  030170  227                    .BYTE   227             ;43
 5215  030171  216                    .BYTE   216             ;44
 5216  030172  237                    .BYTE   237             ;45
 5217  030173  227                    .BYTE   227             ;46
 5218  030174  217                    .BYTE   217             ;47
 5219  030175  237                    .BYTE   237             ;48
 5220  030176  246                    .BYTE   246             ;49
 5221  030177  267                    .BYTE   267             ;50
 5222  030200  256                    .BYTE   256             ;51
 5223  030201  277                    .BYTE   277             ;52
 5224  030202  247                    .BYTE   247             ;53
 5225  030203  257                    .BYTE   257             ;54
 5226  030204  277                    .BYTE   277             ;55
 5227  030205  305                    .BYTE   305             ;56
 5228  030206  327                    .BYTE   327             ;57
 5229  030207  317                    .BYTE   317             ;58
 5230  030210  337                    .BYTE   337             ;59
 5231  030211  307                    .BYTE   307             ;60
 5232  030212  327                    .BYTE   327             ;61
 5233  030213  337                    .BYTE   337             ;62
 5234  030214  347                    .BYTE   347             ;63
 5235  030215  367                    .BYTE   367             ;64
 5236  030216  357                    .BYTE   357             ;65
 5237  030217  377                    .BYTE   377             ;66
```

```
5238  030220     347                          .BYTE   347             ;67
5239  030221     367                          .BYTE   367             ;68
5240  030222     357                          .BYTE   357             ;69
5241  030223     023                          .BYTE   23              ;70
5242  030224     012                          .BYTE   12              ;71
5243  030225     033                          .BYTE   33              ;72
5244  030226     007                          .BYTE   7               ;73
5245  030227     027                          .BYTE   27              ;74
5246  030230     017                          .BYTE   17              ;75
5247  030231     037                          .BYTE   37              ;76
5248  030232     146                          .BYTE   146             ;77
5249  030233     037                          .BYTE   37              ;78
5250  030234     347                          .BYTE   347             ;79
5251  030235     237                BINEMP:   .BYTE   237             ;80
5252
5253  030236  020040  020040     040          .ASCII  /     /
5254  030243     040  000040                  .ASCIZ  /  /
5255  030246  005012     012                  .ASCII  <12><12><12>
5256  030251     015  000012                  .ASCIZ  <15><12>
5257
5258  030254  005015  046412  044501  STMES:  .ASCIZ  <15><12><12>"MAINDEC-11-DZCDB    REV. A"<15><12>
5259  030262  042116  041505  030455
5260  030270  026461  055104  042103
5261  030276  020102  020040  051040
5262  030304  053105  020056  006501
5263  030312  000012
5264
5265  030314  005015  052123  051101  STADDR: .ASCII  <15><12>"STARTING ADDRESSES ARE:"
5266  030322  044524  043516  040440
5267  030330  042104  042522  051523
5268  030336  051505  040440  042522
5269  030344     072
5270  030345     015  031012  030060          .ASCII  <15><12>"200 = INSTRUCTION AND DATA TEST"
5271  030352  036440  044440  051516
5272  030360  051124  041523  044524
5273  030366  047117  040440  042116
5274  030374  042040  052101  020101
5275  030402  042524  052123
5276  030406  005015  030462  020060          .ASCII  <15><12>"210 = ERROR FUNCTION TEST (M-1000/M-200)"
5277  030414  020075  051105  047522
5278  030422  020122  052506  041516
5279  030430  044524  047117  052040
5280  030436  051505  020124  046450
5281  030444  030455  030060  027460
5282  030452  026515  030062  024460
5283  030460  005015  031062  020060          .ASCII  <15><12>"220 = SINGLE TEST LOOP"
5284  030466  020075  044523  043516
5285  030474  042514  052040  051505
5286  030502  020124  047514  050117
5287  030510  005015  032062  020060          .ASCII  <15><12>"240 = READ SINGLE DATA PATTERN TEST"
5288  030516  020075  042522  042101
5289  030524  051440  047111  046107
5290  030532  020105  040504  040524
5291  030540  050040  052101  042524
```

```
5292  030546  047122  052040  051505
5293  030554     124
5294  030555     015  031012  030065          .ASCIZ  <15><12>"250 = ERROR FUNCTION TEST (M-1200)"
5295  030563  036440  042440  051122
5296  030570  051117  043040  047125
5297  030576  052103  047511  020116
5298  030604  042524  052123  024040
5299  030612  026515  031061  030060
5300  030620  000051
5301
5302  030622  005015  050012  053517  POWMES: .ASCII  <15><12><12>"POWER FAILURE OCCURRED - WILL ATTEMPT TO"
5303  030630  051105  043040  044501
5304  030636  052514  042522  047440
5305  030644  041503  051125  042522
5306  030652  020104  020055  044527
5307  030660  046114  040440  052124
5308  030666  046505  052120  052040
5309  030674     117
5310  030675     015  051012  051505          .ASCIZ  <15><12>"RESTART SECTION OF PROGRAM FORMERLY IN USE"<15><12>
5311  030702  040524  052122  051440
5312  030710  041505  044524  047117
5313  030716  047440  020106  051120
5314  030724  043517  040522  020115
5315  030732  047506  046522  051105
5316  030740  054514  044440  020116
5317  030746  051525  006505  000012
5318
5319  030754  005015  047105  042524  MLOGIC: .ASCIZ  <15><12>"ENTERING LOGIC TESTS"
5320  030762  044522  043516  046040
5321  030770  043517  041511  052040
5322  030776  051505  051524     000
5323
5324  031003     015  042412  052116  MDATA:  .ASCIZ  <15><12>"ENTERING DATA TESTS"
5325  031010  051105  047111  020107
5326  031016  040504  040524  052040
5327  031024  051505  051524     000
5328
5329  031031     015  042412  052116  M1200E: .ASCIZ  <15><12>"ENTERING M1200 ERROR FUNCTION TESTS"
5330  031036  051105  047111  020107
5331  031044  030515  030062  020060
5332  031052  051105  047522  020122
5333  031060  052506  041516  044524
5334  031066  047117  052040  051505
5335  031074  051524     000
5336
5337  031077     015  042412  052116  M1000E: .ASCIZ  <15><12>"ENTERING M1000/M200 ERROR FUNCTION TESTS"
5338  031104  051105  047111  020107
5339  031112  030515  030060  027460
5340  031120  031115  030060  042440
5341  031126  051122  051117  043040
5342  031134  047125  052103  047511
5343  031142  020116  042524  052123
5344  031150  000123
5345
```

```
5346  031152  005015  047105  042524  MLOOP:  .ASCIZ  <15><12>"ENTERING A LOOP ON TEST SELECTED BY USER"
5347  031160  044522  043516  040440
5348  031166  046040  047517  020120
5349  031174  047117  052040  051505
5350  031202  020124  042523  042514
5351  031210  052103  042105  041040
5352  031216  020131  051525  051105
5353  031224     000
5354
5355  031225     015  042412  052116  MPATS:  .ASCIZ  <15><12>"ENTERING SINGLE DATA PATTERN TESTING"
5356  031232  051105  047111  020107
5357  031240  044523  043516  042514
5358  031246  042040  052101  020101
5359  031254  040520  052124  051105
5360  031262  020116  042524  052123
5361  031270  047111  000107
5362
5363  031274  005015  051120  051505  MSG1:   .ASCIZ  <15><12>/PRESS CARD READER 'RESET'/
5364  031302  020123  040503  042122
5365  031310  051040  040505  042504
5366  031316  020122  051047  051505
5367  031324  052105  000047
5368  031330  005015  044124  047105  MSG2:   .ASCIZ  <15><12>/THEN HIT 'CONTINUE' ON THE CONSOLE/
5369  031336  044040  052111  023440
5370  031344  047503  052116  047111
5371  031352  042525  020047  047117
5372  031360  052040  042510  041440
5373  031366  047117  047523  042514
5374  031374     000
5375  031375     015  050012  042522  MSG3:   .ASCIZ  <15><12>/PRESS CARD READER 'STOP'/
5376  031402  051523  041440  051101
5377  031410  020104  042522  042101
5378  031416  051105  023440  052123
5379  031424  050117  000047
5380  031430  005015  044124  020105  MSG4:   .ASCIZ  <15><12>/THE INTERRUPT LEVEL WAS /
5381  031436  047111  042524  051122
5382  031444  050125  020124  042514
5383  031452  042526  020114  040527
5384  031460  020123     000
5385  031463     015  051012  046505  MSG5:   .ASCIZ  <15><12>/REMOVE ALL CARDS FROM THE INPUT HOPPER.
5386  031470  053117  020105  046101
5387  031476  020114  040503  042122
5388  031504  020123  051106  046517
5389  031512  052040  042510  044440
5390  031520  050116  052125  044040
5391  031526  050117  042520  000122
5392  031534  005015  042522  052123  MSG6:   .ASCIZ  <15><12>/RESTORE CARDS TO THE INPUT HOPPER
5393  031542  051117  020105  040503
5394  031550  042122  020123  047524
5395  031556  052040  042510  044440
5396  031564  050116  052125  044040
5397  031572  050117  042520  000122
5398  031600  005015  052520  046114  MSG7:   .ASCII  <15><12>/PULL OUTPUT STACKER PRESSURE ARM DOWN
5399  031606  047440  052125  052520
```

```
5400  031614  020124  052123  041501
5401  031622  042513  020122  051120
5402  031630  051505  052523  042522
5403  031636  040440  046522  042040
5404  031644  053517  020116
5405  031650  047125  044524  020114          .ASCIZ  /UNTIL HOPPER CHECK LIGHTS/
5406  031656  047510  050120  051105
5407  031664  041440  042510  045503
5410  031672  046040  043511  052110
5411  031700  000123
5412  031702  005015  047510  042114  MSG8:   .ASCII  <15><12>/HOLD DOWN THE SWITCH UNDER THE CAP OF THE INPUT /
5413  031710  042040  053517  020116
5414  031716  044124  020105  053523
5415  031724  052111  044103  052440
5416  031732  042116  051105  052040
5417  031740  042510  041440  050101
5420  031746  047440  020106  044124
5421  031754  020105  047111  052520
5422  031762  020124
5423  031764  047510  050120  051105          .ASCIZ  /HOPPER/
5424  031772     000
5425  031773     015  051412  044514  MSG9:   .ASCII  <15><12>'SLIDE A CARD FROM THE OUTPUT HOPPER ABOUT HALF AN INCH /
5426  032000  042504  040440  041440
5427  032006  051101  020104  051106
5430  032014  046517  052040  042510
5431  032022  047440  052125  052520
5432  032030  020124  047510  050120
5433  032036  051105  040440  047502
5434  032044  052125  044040  046101
5435  032052  020106  047101  044440
5436  032060  041516  020110
5437  032064  005015  020040  040502          .ASCII  <15><12>/  BACK INTO THE READ HEAD, BLOCKING THE PHOTO CELL/
5440  032072  045503  044440  052116
5441  032100  020117  044124  020105
5442  032106  042522  042101  044040
5443  032114  040505  026104  041040
5444  032122  047514  045503  047111
5445  032130  020107  044124  020105
5446  032136  044120  052117  020117
5447  032144  042503  046114
5450  032150  005015  047516  042524          .ASCII  <15><12>"NOTE: SOME CARD READER MODELS MAY HAVE A LARGE"
5451  032156  020072  047523  042515
5452  032164  041440  051101  020104
5453  032172  042522  042101  051105
5454  032200  046440  042117  046105
5455  032206  020123  040515  020131
5456  032214  040510  042526  040440
5457  032222  046040  051101  042507
5460  032230  005015  047522  046114          .ASCII  '15><12>"ROLLER BLOCKING ACCESS TO THE PHOTOCELL. IN"
5461  032236  051105  041040  047514
5462  032244  045503  047111  020107
5463  032252  041501  042503  051523
5464  032260  052040  020117  044124
5465  032266  020105  044120  052117
```

```
5454  032274  041517  046105  026114
5455  032302  044440     116
5456  032305     015  053412  044510          .ASCII  <15><12>"WHICH CASE THE PHOTOCELL CAN BE BLOCKED"
5457  032312  044103  041440  051501
5458  032320  020105  044124  020105
5459  032326  044120  052117  041517
5460  032334  046105  020114  040503
5461  032342  020116  042502  041040
5462  032350  047514  045503  042105
5463  032356  005015  054502  052040          .ASCII  <15><12>"BY TEARING OFF A PIECE OF CARD AND SLIPPING"
5464  032364  040505  044522  043516
5465  032372  047440  043106  040440
5466  032400  050040  042511  042503
5467  032406  047440  020106  040503
5468  032414  042122  040440  042116
5469  032422  051440  044514  050120
5470  032430  047111     107
5471  032433     015  044412  020124          .ASCIZ  <15><12>"IT IN IN FRONT OF THE PHOTOCELL"
5472  032440  047111  044440  020116
5473  032446  051106  047117  020124
5474  032454  043117  052040  042510
5475  032462  050040  047510  047524
5476  032470  042503  046114     000
5477  032475     015  051012  046505  MSG10:  .ASCIZ  <15><12>/REMOVE JAMMED CARD/
5478  032502  053117  020105  040512
5479  032510  046515  042105  041440
5480  032516  051101  000104
5481  032522  005015  047510  042114  MSG11:  .ASCIZ  <15><12>/HOLD THE OUTPUT STACKER GATE OPEN. THEN/
5482  032530  052040  042510  047440
5483  032536  052125  052520  020124
5484  032544  052123  041501  042513
5485  032552  020122  040507  042524
5486  032560  047440  042520  027116
5487  032566  052040  042510  000116
5488  032574  005015  046120  041501  MSG12:  .ASCII  <15><12>/PLACE SPECIAL DARK-LIGHT CHECK CARD ONLY INTO HOPPER/
5489  032602  020105  050123  041505
5490  032610  040511  020114  040504
5491  032616  045522  046055  043511
5492  032624  052110  041440  042510
5493  032632  045503  041440  051101
5494  032640  020104  047117  054514
5495  032646  044440  052116  020117
5496  032654  047510  050120  051105
5497  032662  005015  027111  027105          .ASCII  <15><12>/I.E. - TEAR A CORNER OFF A CARD AND PLACE IT/
5498  032670  026440  052040  040505
5499  032676  020122  020101  047503
5500  032704  047122  051105  047440
5501  032712  043106  040440  041440
5502  032720  051101  020104  047101
5503  032726  020104  046120  041501
5504  032734  020105  052111
5505  032740  005015  052101  052040          .ASCIZ  <15><12>   /AT THE BOTTOM OF THE INPUT STACK/
5506  032746  042510  041040  052117
5507  032754  047524  020115  043117
```

```
5508  032762  052040  042510  044440
5509  032770  050116  052125  051440
5510  032776  040524  045503     000
5511  033003     015  042012  041505  MSG13:  .ASCIZ  <15><12>/DECK     CARD NUM     CARD COL   SHB     WAS/
5512  033010  020113  020040  020040
5513  033016  040503  042122  047040
5514  033024  046525  020040  020040
5515  033032  041440  051101  020104
5516  033040  047503  020114  020040
5517  033046  044123  020102  020040
5518  033054  020040  040527  000123
5519  033062  005015  046101  044120  MSG14:  .ASCIZ  <15><12>/ALPHA /
5520  033070  020101     000
5521  033073     015  041012  047111  MSG15:  .ASCIZ  <15><12>/BINARY/
5522  033100  051101  000131
5523  033104  005015  044502  020124  MSG16:  .ASCIZ  <15><12>/BIT 15 WAS SET/
5524  033112  032461  053440  051501
5525  033120  051440  052105     000
5526  033125     015  051012  046505  MSG17:  .ASCII  <15><12>/REMEDY THE CONDITION BY RELOADING INPUT HOPPER/
5527  033132  042105  020131  044124
5528  033140  020105  047503  042116
5529  033146  052111  047511  020116
5530  033154  054502  051040  046105
5531  033162  040517  044504  043516
5532  033170  044440  050116  052125
5533  033176  044040  050117  042520
5534  033204     122
5535  033205     015  053412  052111          .ASCII  <15><12>/WITH CARD DECK - PRESS 'RESET' BUTTON/
5536  033212  020110  040503  042122
5537  033220  042040  041505  020113
5538  033226  020055  051120  051505
5539  033234  020123  051047  051505
5540  033242  052105  020047  052502
5541  033250  052124  047117
5542  033254  005015  047117  041440          .ASCIZ  <15><12>/ON CARD READER AND 'CONTINUE' SWITCH ON CPU PANEL/
5543  033262  051101  020104  042522
5544  033270  042101  051105  040440
5545  033276  042116  023440  047503
5546  033304  052116  047111  042525
5547  033312  020047  053523  052111
5548  033320  044103  047440  020116
5549  033326  050103  020125  040520
5550  033334  042516  000114
5551  033340  005015  040503  042122  MSG18:  .ASCIZ  <15><12>/CARD READER IS OFF-LINE/
5552  033346  051040  040505  042504
5553  033354  020122  051511  047440
5554  033362  043106  046055  047111
5555  033370  000105
5556  033372  005015  020040  041440  MSG19:  .ASCIZ  <15><12>/   COL.   WAS   CARD NUM.  ERRORS/
5557  033400  046117  020056  020040
5558  033406  040527  020123  020040
5559  033414  040503  042122  047040
5560  033422  046525  020056  042440
5561  033430  051122  051117  000123
```

```
5562  033436  005015  052520  020124  MSG20:  .ASCIZ  <15><12>/PUT ANY TWO CARDS IN INPUT HOPPER/
5563  033444  047101  020131  053524
5564  033452  020117  040503  042122
5565  033460  020123  047111  044440
5566  033466  050116  052125  044040
5567  033474  050117  042520  000122
5568  033502  005015  051120  051505  MSG21:  .ASCIZ  <15><12>/PRESS END OF FILE BUTTON/
5569  033510  020123  047105  020104
5570  033516  043117  043040  046111
5571  033524  020105  052502  052124
5572  033532  047117     000
5573  033535     015  053412  042510  MSG22:  .ASCII  <15><12>/WHEN PRINTING STOPS PUT 'HALT' AND 'SINGLE BUS CYCLE'/
5574  033542  020116  051120  047111
5575  033550  044524  043516  051440
5576  033556  047524  051520  050040
5577  033564  052125  023440  040510
5578  033572  052114  020047  047101
5579  033600  020104  051447  047111
5580  033606  046107  020105  052502
5581  033614  020123  054503  046103
5582  033622  023505
5583  033624  005015  044450  020106          .ASCII  <15><12>'(IF PRESENT) CONSOLE SWITCHES DOWN AND HIT/
5584  033632  051120  051505  047105
5585  033640  024524  041440  047117
5586  033646  047523  042514  051440
5587  033654  044527  041524  042510
5588  033662  020123  047504  047127
5589  033670  040440  042116  044040
5590  033676  052111
5591  033700  005015  041447  047117          .ASCII  <15><12>/'CONTINUE' ON THE CONSOLE UNTIL ONE CARD IS READ/
5592  033706  044524  052516  023505
5593  033714  047440  020116  044124
5594  033722  020105  047503  051516
5595  033730  046117  020105  047125
5596  033736  044524  020114  047117
5597  033744  020105  040503  042122
5598  033752  044440  020123  042522
5599  033760  042101
5600  033762  005015  044124  047105          .ASCII  <15><12>/THEN PUT UP THE ONE OR TWO SWITCHES AND HIT
5601  033770  050040  052125  052440
5602  033776  020120  044124  020105
5603  034004  047117  020105  051117
5604  034012  052040  047527  051440
5605  034020  044527  041524  042510
5606  034026  020123  047101  020104
5607  034034  044510     124
5608  034037     015  023412  047503          .ASCIZ  <15><12>/'CONTINUE' ON THE CONSOLE
5609  034044  052116  047111  042525
5610  034052  020047  047117  052040
5611  034060  042510  041440  047117
5612  034066  047523  042514     000
5613
5614  034073     015  046012  040517  MSG23:  .ASCII  <15><12>"LOAD THE ADDRESS OF THE DESIRED TEST INTO THE"
5615  034100  020104  044124  020105
```

```
5616  034106  042101  051104  051505
5617  034114  020123  043117  052040
5618  034122  042510  042040  051505
5619  034130  051111  042105  052040
5620  034136  051505  020124  047111
5621  034144  047524  052040  042510
5622  034152  005015  053523  052111          .ASCII  <15><12>"SWITCH REGISTER - I.E. THE ADDRESS OF THE SCOPE"
5623  034160  044103  051040  043505
5624  034166  051511  042524  020122
5625  034174  020055  027111  027105
5626  034202  052040  042510  040440
5627  034210  042104  042522  051523
5628  034216  047440  020106  044124
5629  034224  020105  041523  050117
5630  034232     105
5631  034233     015  044412  051516          .ASCII  <15><12>"INSTRUCTION AT THE BEGINNING OF THE TEST"
5632  034240  051124  041525  044524
5633  034246  047117  040440  020124
5634  034254  044124  020105  042502
5635  034262  044507  047116  047111
5636  034270  020107  043117  052040
5637  034276  042510  052040  051505
5638  034304     124
5639  034305     015  052012  042510          .ASCIZ  <15><12>"THEN PRESS CONTINUE SWITCH"
5640  034312  020116  051120  051505
5641  034320  020123  047503  052116
5642  034326  047111  042525  051440
5643  034334  044527  041524  000110
5644
5645  034342  005015  042523  020124  MSG24:  .ASCII  <15><12>"SET DESIRED SWITCH REGISTER OPTIONS"
5646  034350  042504  044523  042522
5647  034356  020104  053523  052111
5648  034364  044103  051040  043505
5649  034372  051511  042524  020122
5650  034400  050117  044524  047117
5651  034406     123
5652  034407     015  052012  042510          .ASCIZ  <15><12>"THEN PRESS CONTINUE SWITCH"
5653  034414  020116  051120  051505
5654  034422  020123  047503  052116
5655  034430  047111  042525  051440
5656  034436  044527  041524  000110
5657
5658  034444  005015  047514  042101  MSG25:  .ASCII  <15><12>"LOAD DESIRED PATTERN VALUE INTO THE SWITCH"
5659  034452  042040  051505  051111
5660  034460  042105  050040  052101
5661  034466  042524  047122  053040
5662  034474  046101  042525  044440
5663  034502  052116  020117  044124
5664  034510  020105  053523  052111
5665  034516  044103
5666  034520  005015  042522  044507          .ASCII  <15><12>"REGISTER - I.E. INTO SWS<11:0>"
5667  034526  052123  051105  026440
5668  034534  044440  042456  020056
5669  034542  047111  047524  051440
```

```
5670  034550  051527  030474  035061
5671  034556  037060
5672  034560  005015  044124  047105          .ASCIZ  <15><12>"THEN PRESS CONTINUE SWITCH"
5673  034566  050040  042522  051523
5674  034574  041440  047117  044524
5675  034602  052516  020105  053523
5676  034610  052111  044103     000
5677
5678          034616                          .EVEN
5679
5680
5681                                          ;ERROR ITEMS MESSAGE TABLE
5682
5683  034616  052123  052101  051525  EM1:    .ASCII  "STATUS REGISTER (CDS) BIT07 NOT SET BY"
5684  034624  051040  043505  051511
5685  034632  042524  020122  041450
5686  034640  051504  020051  044502
5687  034646  030124  020067  047516
5688  034654  020124  042523  020124
5689  034662  054502
5690  034664  005015  047111  052111          .ASCIZ  <15><12>"INITIALIZATION PULSE"
5691  034672  040511  044514  040532
5692  034700  044524  047117  050040
5693  034706  046125  042523     000
5694
5695  034713     103  046117  046525  EM2:    .ASCII  "COLUMN COUNT REGISTER (CDC) NOT CLEARED BY"
5696  034720  020116  047503  047125
5697  034726  020124  042522  044507
5698  034734  052123  051105  024040
5699  034742  042103  024503  047040
5700  034750  052117  041440  042514
5701  034756  051101  042105  041040
5702  034764     131
5703  034765     015  044412  044516          .ASCIZ  <15><12>"INITIALIZATION PULSE"
5704  034772  044524  046101  055111
5705  035000  052101  047511  020116
5706  035006  052520  051514  000105
5707
5708  035014  052502  020123  042101  EM3:    .ASCII  "BUS ADDRESS REGISTER (CDA) NOT CLEARED BY"
5709  035022  051104  051505  020123
5710  035030  042522  044507  052123
5711  035036  051105  024040  042103
5712  035044  024501  047040  052117
5713  035052  041440  042514  051101
5714  035060  042105  041040     131
5715  035065     015  044412  044516          .ASCIZ  <15><12>"INITIALIZATION PULSE"
5716  035072  044524  046101  055111
5717  035100  052101  047511  020116
5718  035106  052520  051514  000105
5719
5720  035114  052123  052101  051525  EM4:    .ASCIZ  "STATUS REGISTER CONTENTS INCORRECT"
5721  035122  051040  043505  051511
5722  035130  042524  020122  047503
5723  035136  052116  047105  051524
```

```
5724  035144  044440  041516  051117
5725  035152  042522  052103     000
5726
5727  035157     103  046117  046525  EM5:    .ASCII  "COLUMN COUNT REGISTER (CDC) NOT ABLE TO"
5728  035164  020116  047503  047125
5729  035172  020124  042522  044507
5730  035200  052123  051105  024040
5731  035206  042103  024503  047040
5732  035214  052117  040440  046102
5733  035222  020105  047524
5734  035226  005015  042502  046040          .ASCIZ  <15><12>"BE LOADED WITH ALL ONES"
5735  035234  040517  042504  020104
5736  035242  044527  044124  040440
5737  035250  046114  047440  042516
5738  035256  000123
5739
5740  035260  047503  052514  047115  EM6:    .ASCII  "COLJMN COUNT REGISTER (CDC) NOT CLEARED"
5741  035266  041440  052517  052116
5742  035274  051040  043505  051511
5743  035302  042524  020122  041450
5744  035310  041504  020051  047516
5745  035316  020124  046103  040505
5746  035324  042522     104
5747  035327     015  041012  020131          .ASCIZ  <15><12>"BY POWER CLEAR"
5748  035334  047520  042527  020122
5749  035342  046103  040505  000122
5750
5751  035350  052502  020123  042101  EM7:    .ASCII  "BUS ADDRESS REGISTER (CDA) NOT ABLE TO BE"
5752  035356  051104  051505  020123
5753  035364  042522  044507  052123
5754  035372  051105  024040  042103
5755  035400  024501  047040  052117
5756  035406  040440  046102  020105
5757  035414  047524  041040     105
5758  035421     015  046012  040517          .ASCIZ  <15><12>"LOADED WITH ALL ONES"
5759  035426  042504  020104  044527
5760  035434  044124  040440  046114
5761  035442  047440  042516  000123
5762
5763  035450  052502  020123  042101  EM10:   .ASCII  "BUS ADDRESS REGISTER (CDA) NOT CLEARED"
5764  035456  051104  051505  020123
5765  035464  042522  044507  052123
5766  035472  051105  024040  042103
5767  035500  024501  047040  052117
5768  035506  041440  042514  051101
5769  035514  042105
5770  035516  005015  054502  050040          .ASCIZ  <15><12>"BY POWER CLEAR"
5771  035524  053517  051105  041440
5772  035532  042514  051101     000
5773
5774  035537     103  047117  051124  EM11:   .ASCII  "CONTROLLER READY DID NOT CLEAR ON"
5775  035544  046117  042514  020122
5776  035552  042522  042101  020131
5777  035560  044504  020104  047516
```

```
5778  035566  020124  046103  040505
5779  035574  020122  047117
5780  035600  005015  042522  042101          .ASCIZ  <15><12>"READING A CARD"
5781  035606  047111  020107  020101
5782  035614  040503  042122     000
5783
5784  035621     103  047117  051124  EM12:   .ASCII  "CONTROLLER READY DID NOT CLEAR BIT00"
5785  035626  046117  042514  020122
5786  035634  042522  042101  020131
5787  035642  044504  020104  047516
5788  035650  020124  046103  040505
5789  035656  020122  044502  030124
5790  035664     060
5791  035665     015  047412  020106          .ASCIZ  <15><12>"OF STATUS REGISTER (CDS)"
5792  035672  052123  052101  051525
5793  035700  051040  043505  051511
5794  035706  042524  020122  041450
5795  035714  051504  000051
5796
5797  035720  047503  052116  047522  EM13:   .ASCIZ  "CONTROLLER DID NOT SET WITHIN 1 SECOND"
5798  035726  046114  051105  042040
5799  035734  042111  047040  052117
5800  035742  051440  052105  053440
5801  035750  052111  044510  020116
5802  035756  020061  042523  047503
5803  035764  042116     000
5804
5805  035767     105  051122  051117  EM14:   .ASCIZ  "ERROR (BIT15) SET IN STATUS REGISTER (CDS)"
5806  035774  024040  044502  030524
5807  036002  024465  051440  052105
5808  036010  044440  020116  052123
5809  036016  052101  051525  051040
5810  036024  043505  051511  042524
5811  036032  020122  041450  051504
5812  036040  000051
5813
5814  036042  044502  020124  051117  EM15:   .ASCII  "BIT OR BITS SET IN STATUS REGISTER (CDS) THAT"
5815  036050  041040  052111  020123
5816  036056  042523  020124  047111
5817  036064  051440  040524  052524
5818  036072  020123  042522  044507
5819  036100  052123  051105  024040
5820  036106  042103  024523  052040
5821  036114  040510     124
5822  036117     015  051412  047510          .ASCIZ  <15><12>"SHOULD NOT BE"
5823  036124  046125  020104  047516
5824  036132  020124  042502     000
5825
5826  036137     102  051525  020131  EM16:   .ASCII  "BUSY SET IN STATUS REGISTER (CDS)"
5827  036144  042523  020124  047111
5828  036152  051440  040524  052524
5829  036160  020123  042522  044507
5830  036166  052123  051105  024040
5831  036174  042103  024523
```

```
 5832  036200  005015  052111  051440          .ASCIZ  <15><12>"IT SHOULD NOT BE"
 5833  036206  047510  046125  020104
 5834  036214  047516  020124  042502             •
 5835  036222     000
 5836
 5837  036223     122  051505  047524  EM17:   .ASCII  "RESTORING CPU STATUS AFTER READING A CARD"
 5838  036230  044522  043516  041440
 5839  036236  052520  051440  040524
 5840  036244  052524  020123  043101
 5841  036252  042524  020122  042522
 5842  036260  042101  047111  020107
 5843  036266  020101  040503  042122
 5844  036274  005015  046103  040505          .ASCIZ  <15><12>"CLEARED CONTROLLER READY IN STATUS REGISTER"
 5845  036302  042522  020104  047503
 5846  036310  052116  047522  046114
 5847  036316  051105  051040  040505
 5848  036324  054504  044440  020116
 5849  036332  052123  052101  051525
 5850  036340  051040  043505  051511
 5851  036346  042524  000122
 5852
 5853  036352  047516  044440  052116  EM20:   .ASCIZ  "NO INTERRUPT OCCURRED"
 5854  036360  051105  052522  052120
 5855  036366  047440  041503  051125
 5856  036374  042522  000104
 5857
 5858  036400  047101  044440  052116  EM21:   .ASCIZ  "AN INTERRUPT OCCURRED - SHOULD NOT HAVE"
 5859  036406  051105  052522  052120
 5860  036414  047440  041503  051125
 5861  036422  042522  020104  020055
 5862  036430  044123  052517  042114
 5863  036436  047040  052117  044040
 5864  036444  053101  000105
 5865
 5866  036450  047111  042524  051122  EM22:   .ASCIZ  "INTERRUPT ALREADY OCCURRED AT A HIGHER LEVEL"
 5867  036456  050125  020124  046101
 5868  036464  042522  042101  020131
 5869  036472  041517  052503  051122
 5870  036500  042105  040440  020124
 5871  036506  020101  044510  044107
 5872  036514  051105  046040  053105
 5873  036522  046105     000
 5874
 5875  036525     103  047117  051124  EM23:   .ASCIZ  "CONTROLLER READY NOT SET"
 5876  036532  046117  042514  020122
 5877  036540  042522  042101  020131
 5878  036546  047516  020124  042523
 5879  036554  000124
 5880
 5881  036556  047111  042524  051122  EM24:   .ASCIZ  "INTERRUPT ALREADY OCCURRED AT A LOWER LEVEL"
 5882  036564  050125  020124  046101
 5883  036572  042522  042101  020131
 5884  036600  041517  052503  051122
 5885  036606  042105  040440  020124
```

```
 5886  036614  020101  047514  042527
 5887  036622  020122  042514  042526
 5888  036630  000114
 5889
 5890  036632  047101  044440  052116  EM25:   .ASCIZ  "AN INTERRUPT OCCURRED AT TWO DIFFERENT LEVELS"
 5891  036640  051105  052522  052120
 5892  036646  047440  041503  051125
 5893  036654  042522  020104  052101
 5894  036662  052040  047527  042040
 5895  036670  043111  042506  042522
 5896  036676  052116  046040  053105
 5897  036704  046105  000123
 5898
 5899  036710  051105  047522  020122  EM26:   .ASCII  "ERROR (BIT15) NOT SET IN STATUS REGISTER (CDS)"
 5900  036716  041050  052111  032461
 5901  036724  020051  047516  020124
 5902  036732  042523  020124  047111
 5903  036740  051440  040524  052524
 5904  036746  020123  042522  044507
 5905  036754  052123  051105  024040
 5906  036762  042103  024523
 5907  036766  005015  052111  051440          .ASCIZ  <15><12>"IT SHOULD BE"
 5908  036774  047510  046125  020104
 5909  037002  042502     000
 5910
 5911  037005     116  047117  042455  EM27:   .ASCII  "NON-EXISTANT MEMORY (BIT09) NOT SET IN"
 5912  037012  044530  052123  047101
 5913  037020  020124  042515  047515
 5914  037026  054522  024040  044502
 5915  037034  030124  024471  047040
 5916  037042  052117  051440  052105
 5917  037050  044440     116
 5918  037053     015  051412  040524          .ASCIZ  <15><12>"STATUS REGISTER (CDS) - IT SHOULD BE"
 5919  037060  052524  020123  042522
 5920  037066  044507  052123  051105
 5921  037074  024040  042103  024523
 5922  037102  026440  044440  020124
 5923  037110  044123  052517  042114
 5924  037116  041040  000105
 5925
 5926  037122  054105  042524  042116  EM30:   .ASCII  "EXTENDED MEMORY (BIT05) NOT SET IS STATUS"
 5927  037130  042105  046440  046505
 5928  037136  051117  020131  041050
 5929  037144  052111  032460  020051
 5930  037152  047516  020124  042523
 5931  037160  020124  051511  051440
 5932  037166  040524  052524     123
 5933  037173     015  051012  043505          .ASCIZ  <15><12>"REGISTER (CDS)"
 5934  037200  051511  042524  020122
 5935  037206  041450  051504  000051
 5936
 5937  037214  054105  042524  042116  EM31:   .ASCII  "EXTENDED MEMORY (BIT04) NOT SET IN STATUS"
 5938  037222  042105  046440  046505
 5939  037230  051117  020131  041050
```

```
5940  037236  052111  032060  020051
5941  037244  047516  020124  042523
5942  037252  020124  047111  051440
5943  037260  040524  052524     123
5944  037265     015  051012  043505          .ASCIZ  <15><12>"REGISTER (CDS)"
5945  037272  051511  042524  020122
5946  037300  041450  051504  000051
5947
5948  037306  047503  052116  047105  EM32:   .ASCII  "CONTENTS OF BUS ADDRESS REGISTER (CDA)"
5949  037314  051524  047440  020106
5950  037322  052502  020123  042101
5951  037330  051104  051505  020123
5952  037336  042522  044507  052123
5953  037344  051105  024040  042103
5954  037352  024501
5955  037354  005015  047111  047503          .ASCIZ  <15><12>"INCORRECT"
5956  037362  051122  041505  000124
5957
5958  037370  047503  052116  047105  EM33:   .ASCII  "CONTENTS OF COLUMN COUNT REGISTER (CDC)"
5959  037376  051524  047440  020106
5960  037404  047503  052514  047115
5961  037412  041440  052517  052116
5962  037420  051040  043505  051511
5963  037426  042524  020122  041450
5964  037434  041504     051
5965  037437     015  044412  041516          .ASCIZ  <15><12>"INCORRECT"
5966  037444  051117  042522  052103
5967  037452     000
5968
5969  037453     122  040505  042504  EM34:   .ASCII  "READER OFF-LINE BUT CARD READER ERROR"
5970  037460  020122  043117  026506
5971  037466  044514  042516  041040
5972  037474  052125  041440  051101
5973  037502  020104  042522  042101
5974  037510  051105  042440  051122
5975  037516  051117
5976  037520  005015  041050  052111          .ASCIZ  <15><12>"(BIT14) NOT SET IN STATUS REGISTER (CDS)"
5977  037526  032061  020051  047516
5978  037534  020124  042523  020124
5979  037542  047111  051440  040524
5980  037550  052524  020123  042522
5981  037556  044507  052123  051105
5982  037564  024040  042103  024523
5983  037572     000
5984
5985  037573     116  020117  051124  EM35:   .ASCII  "NO TRANSITION TO ON-LINE (BIT03) OCCURRED"
5986  037600  047101  044523  044524
5987  037606  047117  052040  020117
5988  037614  047117  046055  047111
5989  037622  020105  041050  052111
5990  037630  031460  020051  041517
5991  037636  052503  051122  042105
5992  037644  005015  047111  051440          .ASCIZ  <15><12>"IN STATUS REGISTER (CDS)"
5993  037652  040524  052524  020123
```

```
 5994  037660  042522  044507  052123
 5995  037666  051105  024040  042103
 5996  037674  024523     000
 5997
 5998  037677     103  047117  042524  EM36:   .ASCIZ  "CONTENTS OF STATUS REGISTER #2 (CDD) INCORRECT"
 5999  037704  052116  020123  043117
 6000  037712  051440  040524  052524
 6001  037720  020123  042522  044507
 6002  037726  052123  051105  021440
 6003  037734  020062  041450  042104
 6004  037742  020051  047111  047503
 6005  037750  051122  041505  000124
 6006
 6007  037756  047516  044440  052116  EM37:   .ASCIZ  "NO INTERRUPT WITH PROCESSOR AT LEVEL 0"
 6008  037764  051105  052522  052120
 6009  037772  053440  052111  020110
 6010  040000  051120  041517  051505
 6011  040006  047523  020122  052101
 6012  040014  046040  053105  046105
 6013  040022  030040     000
 6014
 6015  040025     104  052101  020101  EM40:   .ASCIZ  "DATA LATE (BIT10) NOT SET IN STATUS REGISTER (CDS)"
 6016  040032  040514  042524  024040
 6017  040040  044502  030524  024460
 6018  040046  047040  052117  051440
 6019  040054  052105  044440  020116
 6020  040062  052123  052101  051525
 6021  040070  051040  043505  051511
 6022  040076  042524  020122  041450
 6023  040104  051504  000051
 6024
 6025  040110  043117  026506  044514  EM41:   .ASCIZ  "OFF-LINE (BIT12) NOT SET IN STATUS REGISTER (CDS)"
 6026  040116  042516  024040  044502
 6027  040124  030524  024462  047040
 6028  040132  052117  051440  052105
 6029  040140  044440  020116  052123
 6030  040146  052101  051525  051040
 6031  040154  043505  051511  042524
 6032  040162  020122  041450  051504
 6033  040170  000051
 6034
 6035  040172  043117  026506  044514  EM42:   .ASCII  "OFF-LINE (BIT12) SET IN STATUS REGISTER"
 6036  040200  042516  024040  044502
 6037  040206  030524  024462  051440
 6038  040214  052105  044440  020116
 6039  040222  052123  052101  051525
 6040  040230  051040  043505  051511
 6041  040236  042524     122
 6042  040241     015  020012  020055           .ASCIZ  <15><12>" - IT SHOULD NOT BE"
 6043  040246  052111  051440  047510
 6044  040254  046125  020104  047516
 6045  040262  020124  042502     000
 6046
 6047  040267     120  041511  020113  EM43:   .ASCIZ  "PICK CHECK (BIT13) NOT SET IN STATUS REGISTER #2 (CDD)"
```

```
 6048  040274  044103  041505  020113
 6049  040302  041050  052111  031461
 6050  040310  020051  047516  020124
 6051  040316  042523  020124  047111
 6052  040324  051440  040524  052524
 6053  040332  020123  042522  044507
 6054  040340  052123  051105  021440
 6055  040346  020062  041450  042104
 6056  040354  000051
 6057
 6058  040356  052123  041501  020113  EM44:   .ASCIZ  "STACK CHECK (BIT12) NOT SET IN STATUS REGISTER #2 (CDD)"
 6059  040364  044103  041505  020113
 6060  040372  041050  052111  031061
 6061  040400  020051  047516  020124
 6062  040406  042523  020124  047111
 6063  040414  051440  040524  052524
 6064  040422  020123  042522  044507
 6065  040430  052123  051105  021440
 6066  040436  020062  041450  042104
 6067  040444  000051
 6068
 6069  040446  047105  020104  043117  EM45:   .ASCII  "END OF FILE (BIT13) SET IN STATUS REGISTER (CDS)"
 6070  040454  043040  046111  020105
 6071  040462  041050  052111  031461
 6072  040470  020051  042523  020124
 6073  040476  047111  051440  040524
 6074  040504  052524  020123  042522
 6075  040512  044507  052123  051105
 6076  040520  024040  042103  024523
 6077  040526  005015  026440  044440          .ASCIZ  <15><12>" - IT SHOULD NOT BE"
 6078  040534  020124  044123  052517
 6079  040542  042114  047040  052117
 6080  040550  041040  000105
 6081
 6082  040554  042522  042101  041440  EM46:   .ASCII  "READ CHECK (BIT14) SET IN STATUS REGISTER (CDS)"
 6083  040562  042510  045503  024040
 6084  040570  044502  030524  024464
 6085  040576  051440  052105  044440
 6086  040604  020116  052123  052101
 6087  040612  051525  051040  043505
 6088  040620  051511  042524  020122
 6089  040626  041450  051504     051
 6090  040633     015  020012  020055          .ASCIZ  <15><12>" - IT SHOULD NOT BE"
 6091  040640  052111  051440  047510
 6092  040646  046125  020104  047516
 6093  040654  020124  042502     000
 6094
 6095  040661     110  050117  042520  EM47:   .ASCII  "HOPPER CHECK (BIT02) SET IN STATUS REGISTER (CDS)"
 6096  040666  020122  044103  041505
 6097  040674  020113  041050  052111
 6098  040702  031060  020051  042523
 6099  040710  020124  047111  051440
 6100  040716  040524  052524  020123
 6101  040724  042522  044507  052123
```

```
6102  040732  051105  024040  042103
6103  040740  024523
6104  040742  005015  026440  044440          .ASCIZ  <15><12>" - IT SHOULD NOT BE"
6105  040750  020124  044123  052517
6106  040756  042114  047040  052117
6107  040764  041040  000105
6108
6109  040770  047105  020104  043117  EMS0:   .ASCII  "END OF FILE (BIT13) OF STATUS REGISTER (CDS) NOT SET"
6110  040776  043040  046111  020105
6111  041004  041050  052111  031461
6112  041012  020051  043117  051440
6113  041020  040524  052524  020123
6114  041026  042522  044507  052123
6115  041034  051105  024040  042103
6116  041042  024523  047040  052117
6117  041050  051440  052105
6118  041054  005015  026440  044440          .ASCIZ  <15><12>" - IT SHOULD BE"
6119  041062  020124  044123  052517
6120  041070  042114  041040  000105
6121
6122  041076  042522  042101  041440  EMS1:   .ASCII  "READ CHECK (BIT14) OF STATUS REGISTER (CDS) NOT SET"
6123  041104  042510  045503  024040
6124  041112  044502  030524  024464
6125  041120  047440  020106  052123
6126  041126  052101  051525  051040
6127  041134  043505  051511  042524
6128  041142  020122  041450  051504
6129  041150  020051  047516  020124
6130  041156  042523     124
6131  041161     015  020012  020055          .ASCIZ  <15><12>" - IT SHOULD BE"
6132  041166  052111  051440  047510
6133  041174  046125  020104  042502
6134  041202     000
6135
6136  041203     110  050117  042520  EMS2:   .ASCII  "HOPPER CHECK (BIT12) OF STATUS REGISTER (CDS) NOT SET"
6137  041210  020122  044103  041505
6138  041216  020113  041050  052111
6139  041224  031061  020051  043117
6140  041232  051440  040524  052524
6141  041240  020123  042522  044507
6142  041246  052123  051105  024040
6143  041254  042103  024523  047040
6144  041262  052117  051440  052105
6145  041270  005015  026440  044440          .ASCIZ  <15><12>" - IT SHOULD BE"
6146  041276  020124  044123  052517
6147  041304  042114  041040  000105
6148
6149  041312  047105  020104  043117  EMS3:   .ASCII  "END OF FILE (BIT13) OF STATUS REGISTER (CDS) DID NOT"
6150  041320  043040  046111  020105
6151  041326  041050  052111  031461
6152  041334  020051  043117  051440
6153  041342  040524  052524  020123
6154  041350  042522  044507  052123
6155  041356  051105  024040  042103
```

```
6156  041364  024523  042040  042111
6157  041372  047040  052117
6158  041376  005015  046103  040505          .ASCIZ  <15><12>"CLEAR WITH TRANSITION TO ON-LINE"
6159  041404  020122  044527  044124
6160  041412  052040  040522  051516
6161  041420  052111  047511  020116
6162  041426  047524  047440  026516
6163  041434  044514  042516     000
6164
6165  041441     122  040505  020104  EM54:   .ASCIZ  "READ CHECK (BIT14) NOT SET IN STATUS REGISTER #2 (CDD)"
6166  041446  044103  041505  020113
6167  041454  041050  052111  032061
6168  041462  020051  047516  020124
6169  041470  042523  020124  047111
6170  041476  051440  040524  052524
6171  041504  020123  042522  044507
6172  041512  052123  051105  021440
6173  041520  020062  041450  042104
6174  041526  000051
6175
6176  041530  040503  042122  051040  EM55:   .ASCIZ  "CARD READER ERROR BUT NOT BOTH CARD"
6177  041536  040505  042504  020122
6178  041544  051105  047522  020122
6179  041552  052502  020124  047516
6180  041560  020124  030070  044124
6181  041566  041440  051101  000104
6182
6183  041574  040503  042122  051040  EM56:   .ASCIZ  "CARD READER ERROR BUT NOT OFF-LINE"
6184  041602  040505  042504  020122
6185  041610  051105  047522  020122
6186  041616  052502  020124  047516
6187  041624  020124  043117  026506
6188  041632  044514  042516     000
6189
6190  041637     105  042116  047440  EM57:   .ASCIZ  "END OF FILE (BIT13) ERROR OF STATUS REGISTER (CDS)"
6191  041644  020106  044506  042514
6192  041652  024040  044502  030524
6193  041660  024463  042440  051122
6194  041666  051117  047440  020106
6195  041674  052123  052101  051525
6196  041702  051040  043505  051511
6197  041710  042524  020122  041450
6198  041716  051504  000051
6199
6200  041722  040504  040524  042440  EM60:   .ASCIZ  "DATA ERROR (BIT11) OF STATUS REGISTER (CDS)"
6201  041730  051122  051117  024040
6202  041736  044502  030524  024461
6203  041744  047440  020106  052123
6204  041752  052101  051525  051040
6205  041760  043505  051511  042524
6206  041766  020122  041450  051504
6207  041774  000051
6208
6209  041776  040504  040524  046040  EM61:   .ASCIZ  "DATA LATE (BIT11) ERROR OF STATUS REGISTER (CDS)"
```

```
 6210  042004  052101  020105  041050
 6211  042012  052111  030461  020051
 6212  042020  051105  047522  020122
 6213  042026  043117  051440  040524
 6214  042034  052524  020123  042522
 6215  042042  044507  052123  051105
 6216  042050  024040  042103  024523
 6217  042056     000
 6218
 6219  042057     116  047117  042455  EM62:   .ASCII  "NON-EXISTANT MEMORY (BIT09) ERROR OF STATUS"
 6220  042064  044530  052123  047101
 6221  042072  020124  042515  047515
 6222  042100  054522  024040  044502
 6223  042106  030124  024471  042440
 6224  042114  051122  051117  047440
 6225  042122  020106  052123  052101
 6226  042130  051525
 6227  042132  005015  042522  044507          .ASCIZ  <15><12>"REGISTER (CDS)"
 6228  042140  052123  051105  024040
 6229  042146  042103  024523     000
 6230
 6231  042153     104  051511  051501  EM63:   .ASCIZ  "DISASTEROUS ERROR BUT NO ERROR BITS SET"
 6232  042160  042524  047522  051525
 6233  042166  042440  051122  051117
 6234  042174  041040  052125  047040
 6235  042202  020117  051105  047522
 6236  042210  020122  044502  051524
 6237  042216  051440  052105     000
 6238
 6239  042223     104  052101  020101  EM64:   .ASCII  "DATA PACKING (BIT01) OF STATUS REGISTER (CDS)"
 6240  042230  040520  045503  047111
 6241  042236  020107  041050  052111
 6242  042244  030460  020051  043117
 6243  042252  051440  040524  052524
 6244  042260  020123  042522  044507
 6245  042266  052123  051105  024040
 6246  042274  042103  024523
 6247  042300  005015  047516  020124          .ASCIZ  <15><12>"NOT SET - IT SHOULD BE"
 6248  042306  042523  020124  020055
 6249  042314  052111  051440  047510
 6250  042322  046125  020104  042502
 6251  042330     000
 6252
 6253  042331     123  047510  046125  EM65:   .ASCII  "SHOULD BE ADDRESSING BINARY DECK"
 6254  042336  020104  042502  040440
 6255  042344  042104  042522  051523
 6256  042352  047111  020107  044502
 6257  042360  040516  054522  042040
 6258  042366  041505     113
 6259  042371     015  050012  047522          .ASCIZ  <15><12>"PROGRAM DOES NOT AGREE"
 6260  042376  051107  046501  042040
 6261  042404  042517  020123  047516
 6262  042412  020124  043501  042522
 6263  042420  000105
```

```
6264
6265  042422  047503  052116  047105  EM66:   .ASCII  "CONTENTS OF STATUS REGISTER (CDS) INCORRECT"
6266  042430  051524  047440  020106
6267  042436  052123  052101  051525
6268  042444  051040  043505  051511
6269  042452  042524  020122  041450
6270  042460  051504  020051  047111
6271  042466  047503  051122  041505
6272  042474     124
6273  042475     015  020012  020055          .ASCIZ  <15><12>" - SHOULD BE ZERO"
6274  042502  044123  052517  042114
6275  042510  041040  020105  042532
6276  042516  047522     000
6277
6278  042521     117  042104  041040  EM67:   .ASCIZ  "ODD BUS ADDRESS CAUSED A TRAP IN NON-PACK MODE"
6279  042526  051525  040440  042104
6280  042534  042522  051523  041440
6281  042542  052501  042523  020104
6282  042550  020101  051124  050101
6283  042556  044440  020116  047516
6284  042564  026516  040520  045503
6285  042572  046440  042117  000105
6286
6287                          ;ERROR ITEMS HEADER TABLE
6288
6289  042600  024040  041520  020051  DH1:    .ASCIZ  " (PC)    (SP)   (CDS)   (CDD)    (PS)"
6290  042606  020040  024040  050123
6291  042614  020051  020040  041450
6292  042622  051504  020051  020040
6293  042630  041450  042104  020051
6294  042636  020040  024040  051520
6295  042644  000051
6296  042646  024040  041520  020051  DH2:    .ASCIZ  " (PC)    (SP)   (CDS)   (CDD)   (CDC)    (PS)"
6297  042654  020040  024040  050123
6298  042662  020051  020040  041450
6299  042670  051504  020051  020040
6300  042676  041450  042104  020051
6301  042704  020040  041450  041504
6302  042712  020051  020040  024040
6303  042720  051520  000051
6304  042724  024040  041520  020051  DH3:    .ASCIZ  " (PC)    (SP)   (CDS)   (CDD)   (CDA)    (PS)"
6305  042732  020040  024040  050123
6306  042740  020051  020040  041450
6307  042746  051504  020051  020040
6308  042754  041450  042104  020051
6309  042762  020040  041450  040504
6310  042770  020051  020040  024040
6311  042776  051520  000051
6312  043002  024040  041520  020051  DH4:    .ASCIZ  " (PC)    (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)"
6313  043010  020040  024040  050123
6314  043016  020051  020040  041450
6315  043024  051504  020051  020040
6316  042032  041450  042104  020051
6317  043040  020040  041450  041504
```

```
6318  043046  020051  020040  041450
6319  043054  040504  020051  020040
6320  043062  024040  051520  000051
6321  043070  024040  041520  020051  DH5:    .ASCII  " (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)   (CDA)   (PS)"
6322  043076  020040  024040  050123
6323  043104  020051  020040  041450
6324  043112  051504  020051  020040
6325  043120  041450  042104  020051
6326  043126  020040  041450  041504
6327  043134  020051  020040  041450
6328  043142  040504  020051  020040
6329  043150  041450  040504  020051
6330  043156  020040  024040  051520
6331  043164     051
6332  043165     015  020012  020040          .ASCIZ  <15><12>"                                       WAS     SHB"
6333  043172  020040  020040  020040
6334  043200  020040  020040  020040
6335  043206  020040  020040  020040
6336  043214  020040  020040  020040
6337  043222  020040  020040  020040
6338  043230  020040  020040  020040
6339  043236  020040  040527  020123
6340  043244  020040  020040  044123
6341  043252  000102
6342  043254  024040  041520  020051  DH6:    .ASCII  " (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)   (CDC)   (PS)"
6343  043262  020040  024040  050123
6344  043270  020051  020040  041450
6345  043276  051504  020051  020040
6346  043304  041450  042104  020051
6347  043312  020040  041450  041504
6348  043320  020051  020040  041450
6349  043326  040504  020051  020040
6350  043334  041450  041504  020051
6351  043342  020040  024040  051520
6352  043350     051
6353  043351     015  020012  020040          .ASCIZ  <15><12>"                                       WAS             SHB"
6354  043356  020040  020040  020040
6355  043364  020040  020040  020040
6356  043372  020040  020040  020040
6357  043400  020040  020040  020040
6358  043406  020040  020040  020040
6359  043414  040527  020123  020040
6360  043422  020040  020040  020040
6361  043430  020040  020040  044123
6362  043436  000102
6363  043440  024040  041520  020051  DH7:    .ASCII  " (PC)   (SP)   (CDS)   (CDD)   (CDD)   (PS)"
6364  043446  020040  051450  024520
6365  043454  020040  024040  042103
6366  043462  024523  020040  024040
6367  043470  042103  024504  020040
6368  043476  024040  042103  024504
6369  043504  020040  020040  050050
6370  043512  024523
6371  043514  005015  020040  020040          .ASCIZ  <15><12>"                                   WAS     SHB"
```

```
  6372  043522  020040  020040  020040
  6373  043530  020040  020040  020040
  6374  043536  020040  020040  020040
  6375  043544  020040  040527  020123
  6376  043552  020040  020040  044123
  6377  043560  000102
  6378                                          .EVEN
  6379
  6380                                  ;ERROR ITEMS DATA TABLE
  6381
  6382  043562  001116  001174  001200  DT1:    $ERRPC,$REG6,$TMP0,$TMP1,$REG7,0
  6383  043570  001202  001176  000000
  6384  043576  001116  001174  001200  DT2:    $ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$REG7,0
  6385  043604  001202  001204  001176
  6386  043612  000000
  6387  043614  001116  001174  001200  DT3:    $ERRPC,$REG6,$TMP0,$TMP1,$TMP3,$REG7,0
  6388  043622  001202  001206  001176
  6389  043630  000000
  6390  043632  001116  001174  001200  DT4:    $ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7,0
  6391  043640  001202  001204  001206
  6392  043646  001176  000000
  6393  043652  001116  001174  001200  DT5:    $ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$TMP4,$REG7,0
  6394  043660  001202  001204  001206
  6395  043666  001210  001176  000000
  6396  043674  001116  001174  001200  DT6:    $ERRPC,$REG6,$TMP0,$TMP1,$TMP4,$REG7,0
  6397  043702  001202  001210  001176
  6398  043710  000000
  6399
```

```
                                ;*****************************************************************
                                ;SUBROUTINE TO INITIALIZE CSR AND DBR POINTERS
                                ;*****************************************************************

043712  013703  001232  SETUP:  MOV     CDST,CDS                ;SET UP STATUS REGISTER POINTER
043716  013704  001234          MOV     CDCC,CDC                ;SET UP COLUMN COUNT REGISTER POINTER
043722  013705  001236          MOV     CDBA,CDA                ;SET UP BUS ADDRESS REGISTER POINTER
043726  013702  001244          MOV     INTVC,ADINT             ;LOAD ADDRESS OF INTERRUPT VECTOR
043732  013712  001246          MOV     INTVC+2,(ADINT)         ;SET UP CARD READER TRAP VECTOR
043736  005077  135304          CLR     @INTVC+2                ;TO HALT
043742  005037  001252          CLR     INTFLG                  ;INITIALIZE INTERRUPT FLAG
043746  005037  001254          CLR     TRFLG                   ;INITIALIZE TRACE FLAG
043752  013746  000340          MOV     PR7,-(SP)       ;;PUT NEW PS ON STACK
043756  012746  043764          MOV     #64$,-(SP)      ;;PUT NEW PC ON  STACK
043762  000002                  RTI                     ;; POP NEW PC AND PS
043764                  64$:
043764  000207          RTS     PC                      ;RETURN TO MAINLINE CODE

                                ;*****************************************************************
```

```
        ;*****************************************************************

        ;*****************************************************************

        ;
        ;THIS MARKS THE BEGINNING OF THE MEMORY BUFFER AREA WHERE THE
        ;CONTENTS OF THE CARD COLUMNS ARE DUMPED ON READ CYCLES
        ;
        ;
```

```
                                ;*****************************************************************

                                ;*****************************************************************

                                ;*****************************************************************

043766  000000          BUFBEG: 0
000001                  .END
```

```
ADINT =%000002          276#  1147*  1172*  1194   1209*  1217*  1242*  1252*  1266*  1291*  1327   1332*  1344*
                       1364*  1389*  1425   1430*  1442*  1462*  1487*  1523   1528*  1540*  1560*  1585*  1621
                       1626*  1638*  1653*  1678*  1714   1719*  1731*  1751*  1776*  1812   1817*  1829*  1849*
                       1874*  1910   1915*  1923*  1944*  1969*  1981   1991*  1998*  2023*  2044*  2051   2060*
                       2067*  2092*  2114*  2257*  2282*  2321   2328*  2338*  2430*  2455*  2936*  3145*  3170*
                       3208*  3233*  3269*  3294*  3359*  3384*  3407*  3432*  3486*  3511*  3533*  3558*  3640*
                       3665*  3688*  3713*  3795*  3820*  3843*  3868*  3948*  3974*  4011*  4095*  4120*  6408*
                       6409*
ALPCD   027276         2410   4920#
ALPCDP  027536         5004#
ALPEND  027534         2411   4999#
ALPENP  027655         5083#
ALPI    012340         2405   2410#
BEGIN   002170          295    868#   907
BINCD   027656         2406   5087#
BINCDP  030116         5172#
BINEND  030114         2407   5166#
BINENP  030235         5251#
BIT0  = 000001          258#
BIT00 = 000001          248#   258
BIT01 = 000002          247#   257
BIT02 = 000004          246#   256
BIT03 = 000010          245#   255
BIT04 = 000020          244#   254
BIT05 = 000040          243#   253
BIT06 = 000100          242#   252
BIT07 = 000200          241#   251
BIT08 = 000400          240#   250
BIT09 = 001000          239#   249
BIT1  = 000002          257#
BIT10 = 002000          238#  4539
BIT11 = 004000          237#  4592
BIT12 = 010000          236#  2900
BIT13 = 020000          235#  4546
BIT14 = 040000          234#  4574
BIT15 = 100000          233#
BIT2  = 000004          256#
BIT3  = 000010          255#
BIT4  = 000020          254#
BIT5  = 000040          253#
BIT6  = 000100          252#
BIT7  = 000200          251#
BIT8  = 000400          250#
BIT9  = 001000          249#
BKGND   012646         2469#  2470   2475
BKGND1  012660         2472#  2473
BPTVEC= 000014          265#
BUFBEG  043766         1050   1102   1189   1244   1322   1420   1518   1616   1709   1807   1905   1975   2040
                       2315   2342   2344   2355   2457   2796   3074   3449   3575   3613   3730   3768   3885
                       3992   4068   4346   6438#
BUFEND  015264         2494*  2495*  2496*  2497   2499   2653*  2654*  2655   2657   2958#
CARDIM  025434         4313*  4314*  4315   4366   4437#
CDA   =%000005          279#   948   1024*  1025   1034   1050*  1102*  1189*  1244*  1322*  1420*  1518*  1616*
                       1709*  1807*  1905*  1975*  2040*  2109*  2139   2205*  2208*  2210   2222*  2227   2239*
```

```
CKSTRT  024750          4334*   4378
CLCNT   015300          2401*   2518*   2520    2667*   2669    2823*   2824    2826*   2840*   2964*   4345*   4359*   4360
                        4368*   4369    4397*   4398    4401*   4425*   4427
CONTC   016602          3191    3196*
CONTD   012362          2409    2413*
CONT20  010430          1986    1990*
CONT21  010740          2055    2058*
CONT7   003730          1200    1209*
COUNT   001250           402*   1065*   1075*   1107*   1124*   1977*   1978*   2502*   2516*   2659*   2665*   2747*
COUNTG  001264           409*
CRLF    030251          3066    3072    3104    3120    3188    3311    3341    3403    3468    3529    3600    3684    3758
                        3839    3915    3922    4035    4058    4139    4396    5256*
DATRST  015252          2644    2759    2953*
DATST   012260          2373    2399*   2951    2954
DCNT1   012426          2420    2427*
DDISP = 177570           180*    357
DECK    014540          2408*   2412*   2816*
DECKCK  015226          2920    2923    2947*
DERCNT  015304          2471*   2474*   2966*
DERFLG  025440          4316*   4327*   4338*   4344*   4355    4382    4384    4402    4440*
DH1     042600           432     455     495     503     510     517     525     533     541     648     656     853     6289*
DH2     042646           440     463     471    6296*
DH3     042724           448     479     487    6304*
DH4     043002           548     555     562     569     576     583     591     599     607     615     622     663     679
                         687     695     703     711     719     727     735     743     751     759     767     776     784
                         791     798     806     813     821     829     837     845     861    6312*
DH5     043070           630    6321*
DH6     043254           639    6342*
DH7     043440           671    6363*
DISPAT  027270          4896    4903*
DISPLA  001140           357*    903*   3004*   3047*   4189*   4299*   4538*   4603*
DISPRE  000174           291*    903    3004    3047    4189    4299
DONE6   003420          1134    1137*
DSWR  = 177570           179*    356
DT1     043562           433     456     496     504     511     518     526     534     542     649     657     854     6382*
DT2     043576           441     464     472    6384*
DT3     043614           449     480     488    6387*
DT4     043632           549     556     563     570     577     584     592     600     608     616     623     664     680
                         688     696     704     712     720     728     736     744     752     760     768     777     785
                         792     799     807     814     822     830     838     846     862    6390*
DT5     043652           632     641    6393*
DT6     043674           673    6396*
DUMMY = 000000           275*   2816
EMTVEC= 000030           268*    876*    877*   2977*   2978*   3020*   3021*   4162*   4163*   4272*   4273*
EM1     034616           430    5683*
EM10    035450           485    5763*
EM11    035537           493    5774*
EM12    035621           501    5784*
EM13    035720           509    5797*
EM14    035767           516    5805*
EM15    036042           523     621    5814*
EM16    036137           531    5826*
EM17    036223           539    5837*
EM2     034713           438    5695*
```

```
EM20    036352              547    5853#
EM21    036400              554    5858#
EM22    036450              561    5866#
EM23    036525              568    5875#
EM24    036556              575    5881#
EM25    036632              582    5890#
EM26    036710              589    5899#
EM27    037005              597    5911#
EM3     035014              446    5708#
EM30    037122              605    5926#
EM31    037214              613    5937#
EM32    037306              628    5948#
EM33    037370              637    5958#
EM34    037453              646    5969#
EM35    037573              654    5985#
EM36    037677              669    5998#
EM37    037756              678    6007#
EM4     035114              454    5720#
EM40    040025              685    6015#
EM41    040110              693    6025#
EM42    040172              701    6035#
EM43    040267              709    6047#
EM44    040356              717    6058#
EM45    040446              725    6069#
EM46    040554              733    6082#
EM47    040661              741    6095#
EM5     035157              461    5727#
EM50    040770              749    6109#
EM51    041076              757    6122#
EM52    041203              765    6136#
EM53    041312              773    6149#
EM54    041441              782    6165#
EM55    041530              790    6176#
EM56    041574              797    6183#
EM57    041637              804    6190#
EM6     035260              469    5740#
EM60    041722              812    6200#
EM61    041776              819    6209#
EM62    042057              827    6219#
EM63    042153              662    6231#
EM64    042223              835    6239#
EM65    042331              843    6253#
EM66    042422              851    6265#
EM67    042521              859    6278#
EM7     035350              477    5751#
ENDCK   012232             2371#
ERCD11  015602              315    3012#
ERCD12  016106             3054    3057#
ERFLG   001260              407#   2403#   2811    2813#   4337#   4392    4394#
ERRVEC= 000004              261#   4579    4580#   4582#   4585#
ER12CD  016074             3011    3054#   4145
ER1200  015306              326    2969#
GNS   = ****** U            290    4856    4857    4858    4859    4860
HOOK1   015134             2910    2917#
```

DZCDBA.P11 CROSS REFERENCE TABLE

```
INIT    025442          1146    1216    1265    1363    1461    1559    1652    1750    1848    1943    1997    2066    2256
                        2353    2427    3065    3101    3144    3338    3464    3594    3747    3911    3923    4054    4334
                        4446#
INTFLG  001252           403#   1334    1336    1347    1349*   1356    1432    1434    1445    1447*   1454    1530    1532
                        1543    1545*   1552    1628    1630    1641    1643*   1645    1721    1723    1734    1736*   1743
                        1819    1821    1832    1834*   1841    1926    1928*   1935    6411*
INTVC   001244           400#   6408    6409    6410*
IOTVEC= 000020           266#    874*    875*   2975*   2976*   3018*   3019*   4160*   4161*   4270*   4271*
ISR     012714          2482    2485#
ISRBE   013114          2517    2526#
ISRDE   013142          2509    2512    2534#
ISRDE4  013440          2579    2598#
ISRD1   013150          2536#   2573
ISRD2   013354          2535    2578#
ISRER   013454          2488    2605#
ISRE1   013462          2605    2609#
ISRE2   013520          2610    2622#
ISRE3   013530          2614    2623    2626#
ISRLP   013006          2503#   2521    2524
ISRNC   013000          2498    2502#   2620
ISRNX   013120          2527#
ISRNX1  013136          2529    2531#
ISRRT   013042          2510    2513#   2564    2566    2601
ISRST   013600          2607    2619    2642    2644#
LASTCD  014614          2616    2755    2793    2831#
LOOP5   003170          1068    1071#   1075
LOOP6   003412          1133#
LOOP6A  003362          1122#   1125
LOOP6B  003400          1123    1128#
LSTCD1  014630          2833#   2835
MDATA   031003          2399    5324#
MLOGIC  030754           912     922    925    5319#
MLOOP   031152          4240    5346#
MPATS   031225          4306    5355#
MSG1    031274          3118    3310    3402    3528    3599    3683    3757    3838    3913    4033    4057    4138    5363#
MSG10   032475          3837    5477#
MSG11   032522          5481#
MSG12   032574          4055    5488#
MSG13   033003          2814    5511#
MSG14   033062          2412    5519#
MSG15   033073          2408    5521#
MSG16   033104          5523#
MSG17   033125          4461    5526#
MSG18   033340          4460    5551#
MSG19   033372          4395    5556#
MSG2    031330          3103    3119    3340    3467    3596    3914    3921    4034    5368#
MSG20   033436          3912    5562#
MSG21   033502          3920    5568#
MSG22   033535          3067    5573#
MSG23   034073          4194    5614#
MSG24   034342          4200    4331    5645#
MSG25   034444          4309    5658#
MSG3    031375          3102    3187    3748    5375#
MSG4    031430          1350    1448    1546    1737    1835    1929    5380#
```

```
MSG5    031463  3339    3595    5385#
MSG6    031534  3401    3682    4032    4137    5392#
MSG7    031600  3465    5396#
MSG8    031702  3597    5410#
MSG9    031773  3749    5421#
M1000E  031077  3051    5337#
M1200E  031031  3008    5329#
NOHEAD  014536  2812    2815#
NOTRAP  002512   917#    928
NOTRP1  012370  2415#   2422
NXCRD   014654  2522    2526    2671    2675    2840#
OFFSET  015262  2459#   2785    2787#   2791#   2957#
ONINT   015214  2936    2940#
ONLINE  015150  3918    2922#
PAKSET  014466  2467    2530    2803#
PC    =%000007   192#    909#    938#   1048#   1099#   1146#   1216#   1265#   1363#   1461#   1559#   1652#   1750#
                1848#   1943#   1997#   2066#   2256#   2353#   2427#   2467#   2522#   2526#   2530#   2580#   2616#
                2671#   2675#   2717#   2755#   2793#   2808#   2828#   2837#   2845#   2865#   2868#   2887#   3056#
                3065#   3101#   3144#   3338#   3464#   3594#   3747#   3911#   3923#   4054#   4193#   4308#   4334#
                4446#   4453#   4459#   4504#   4548#   4646#   4653#   4660#   4674#   4676#   4895    6417#
PIRQ  = 177772   178#
PIRQVE= 000240   272#
POWFES  030622  4894    5302#
PROC    001256   405#   1060#   1077    1117#   1129
PR0   = 000000   195#   1061    1118    1970    2045
PR1   = 000040   196#
PR2   = 000100   197#
PR3   = 000140   198#
PR4   = 000200   199#
PR5   = 000240   200#
PR6   = 000300   201#
PR7   = 000340   202#    918    2416    6413
PS    = 177776   175#    176
PSR     013604  2483    2646#
PSRBE   013744  2666    2675#
PSRDE   014016  2661    2687#
PSRDE3  014210  2716    2729#
PSRD1   014024  2689#   2710
PSRD2   014146  2688    2715#
PSFER   014222  2648    2735#
PSRE1   014230  2735    2739#
PSRE2   014266  2740    2748#
PSRE3   014326  2749    2761#
PSRE4   014336  2753    2762    2765#
PSRLP   013666  2660#   2670    2673    2779
PSRNC   013660  2656    2659#   2757
PSRNX   013750  2676#
PSRNX1  014012  2678    2684#
PSRRT   013672  2662#   2701    2703    2732
PSRST   014376  2737    2777    2779#
PSW   = 177776   176#
PTOFF   015302  2965#
PWRVEC= 000024   267#    880#    881#   2981#   2982#   3024#   3025#   4166#   4167#   4276#   4277#   4867#   4868#
                4876#   4891#   4892#
```

1760 1761 1763* 1764* 1768* 1769* 1772* 1773* 1775 1776 1778* 1779* 1782*
1783* 1785 1786 1788* 1789* 1792* 1793* 1796* 1797* 1799 1800 1802* 1803*
1812* 1813* 1831 1836* 1851* 1852* 1855* 1856* 1858 1859 1861* 1862* 1866*
1867* 1870* 1871* 1873 1874 1876* 1877* 1880* 1881* 1883 1884 1886* 1887*
1890* 1891* 1894* 1895* 1897 1898 1900* 1901* 1910* 1911* 1925 1930* 1946*
1947* 1950* 1951* 1953 1954 1956* 1957* 1961* 1962* 1965* 1966* 1968 1969
1970* 1971* 1981* 1982* 1988 2000* 2001* 2004* 2005* 2007 2008 2010* 2011*
2015* 2016* 2019* 2020* 2022 2023 2025* 2026* 2029* 2030* 2032 2033 2035*
2036* 2043 2045* 2046* 2051* 2052* 2056 2069* 2070* 2073* 2074* 2076 2077
2079* 2080* 2084* 2085* 2088* 2089* 2091 2092 2094* 2095* 2098* 2099* 2101
2102 2104* 2105* 2112 2259* 2260* 2263* 2264* 2266 2267 2269* 2270* 2274*
2275* 2278* 2279* 2281 2282 2284* 2285* 2288* 2289* 2291 2292 2294* 2295*
2298* 2299* 2302* 2303* 2305 2306 2308* 2309* 2321* 2322* 2341 2365 2416*
2417* 2423* 2424* 2432* 2433* 2436* 2437* 2439 2440 2442* 2443* 2447* 2448*
2451* 2452* 2454 2455 2586* 2588* 2593* 2719* 2724* 2819* 2824* 2859 2860
2872* 2879* 2880* 2892* 2893* 2896 2897* 2898 2899* 2904* 2905* 2944 2953
2974* 2989* 2990* 2994* 2998* 2999* 3005 3006 3007 3017* 3032* 3033* 3037*
3041* 3042* 3048 3049 3050 3147* 3148* 3151* 3152* 3154 3155 3157* 3158*
3162* 3163* 3166* 3167* 3169 3170 3172* 3173* 3176* 3177* 3179 3180 3182*
3183* 3210* 3211* 3214* 3215* 3217 3218 3220* 3221* 3225* 3226* 3229* 3230*
3232 3233 3235* 3236* 3239* 3240* 3242 3243 3245* 3246* 3252 3271* 3272*
3275* 3276* 3278 3279 3281* 3282* 3286* 3287* 3290* 3291* 3293 3294 3296*
3297* 3300* 3301* 3303 3304 3306* 3307* 3314 3361* 3362* 3365* 3366* 3368
3369 3371* 3372* 3376* 3377* 3380* 3381* 3383 3384 3386* 3387* 3390* 3391*
3393 3394 3396* 3397* 3406 3409* 3410* 3413* 3414* 3416 3417 3419* 3420*
3424* 3425* 3428* 3429* 3431 3432 3434* 3435* 3438* 3439* 3441 3442 3444*
3445* 3453 3488* 3489* 3492* 3493* 3495 3496 3498* 3499* 3503* 3504* 3507*
3508* 3510 3511 3513* 3514* 3517* 3518* 3520 3521 3523* 3524* 3532 3535*
3536* 3539* 3540* 3542 3543 3545* 3546* 3550* 3551* 3554* 3555* 3557 3558
3560* 3561* 3564* 3565* 3567 3568 3570* 3571* 3579 3642* 3643* 3646* 3647*
3649 3650 3652* 3653* 3657* 3658* 3661* 3662* 3664 3665 3667* 3668* 3671*
3672* 3674 3675 3677* 3678* 3687 3690* 3691* 3694* 3695* 3697 3698 3700*
3701* 3705* 3706* 3709* 3710* 3712 3713 3715* 3716* 3719* 3720* 3722 3723
3725* 3726* 3734 3797* 3798* 3801* 3802* 3804 3805 3807* 3808* 3812* 3813*
3816* 3817* 3819 3820 3822* 3823* 3826* 3827* 3829 3830 3832* 3833* 3842
3845* 3846* 3849* 3850* 3852 3853 3855* 3856* 3860* 3861* 3864* 3865* 3867
3868 3870* 3871* 3874* 3875* 3877 3878 3880* 3881* 3889 3951* 3952* 3955*
3956* 3958 3959 3961* 3962* 3966* 3967* 3970* 3971* 3973 3974 3976* 3977*
3980* 3981* 3983 3984 3986* 3987* 3997 4013 4097* 4098* 4101* 4102* 4104
4105 4107* 4108* 4112* 4113* 4116* 4117* 4119 4120 4122* 4123* 4126* 4127*
4129 4130 4132* 4133* 4142 4159* 4174* 4175* 4179* 4183* 4184* 4190 4191
4192 4206* 4207* 4210* 4211* 4213 4214 4216* 4217* 4223* 4224* 4227* 4228*
4230 4231 4233* 4234* 4269* 4284* 4285* 4289* 4293* 4294* 4300 4301 4302
4398* 4405* 4411* 4417* 4420* 4476* 4481* 4502 4506* 4530 4531 4543 4579*
4582 4584 4585 4602 4604* 4630* 4631 4632* 4634 4635 4636* 4638 4640
4642 4647 4649* 4651* 4659* 4663 4667 4668 4672 4708* 4709 4710 4711*
4716* 4717* 4718* 4724 4749 4750 4751 4752* 4753* 4775* 4776* 4777* 4778*
4779* 4780* 4781 4784* 4797 4799* 4801 4811 4813 4815 4816 4817 4818
4819 4821* 4822* 4839* 4840 4869* 4870* 4871* 4872* 4873* 4874* 4875 4881*
4885 4886 4887 4888 4889 4890 4895* 4897* 6413* 6414*

SPACE 030243 2592 2718 2723 2817 2822 2827 4400 4404 4416 4419 5254*
SRETRN 014402 2531 2684 2785* 2788 2792
SRETR1 014422 2786 2789*
SRETR3 014432 2791* 2794

DZCDBA.P11 CROSS REFERENCE TABLE

```
SRETRN  014442           2790    2793#
SRVC    012674           2430    2478#
STACK = 001100            172#    873    2974    3017    4159    4269
STADDR  030314            911    5265#
STKLMT= 177774            177#
STMES   030254            910    3057    4239    4305    5258#
SWR     001136            356#    900     902*    927    2372    2404    2421    2463    2465    2528    2578    2598    2677
                         2715    2729    2744    2900    2917    2948    3001    3003*   3044    3046*   4186    4188*   4198
                         4203    4296    4298*   4313    4339    4341    4390    4422    4430    4539    4546    4551    4574
                         4592
SWREG   000176            292#    902    3003    3046    4188    4298
SW0   = 000001            230#
SW00  = 000001            220#    230
SW01  = 000002            219#    229
SW02  = 000004            218#    228
SW03  = 000010            217#    227
SW04  = 000020            216#    226
SW05  = 000040            215#    225
SW06  = 000100            214#    224
SW07  = 000200            213#    223
SW08  = 000400            212#    222
SW09  = 001000            211#    221
SW1   = 000002            229#
SW10  = 002000            210#
SW11  = 004000            209#
SW12  = 010000            208#
SW13  = 020000            207#
SW14  = 040000            206#
SW15  = 100000            205#
SW2   = 000004            228#
SW3   = 000010            227#
SW4   = 000020            226#
SW5   = 000040            225#
SW6   = 000100            224#
SW7   = 000200            223#
SW8   = 000400            222#
SW9   = 001000            221#
TBITVE= 000014            263#    884*    885*    2985*   2986*   3028*   3029*   4170*   4171*   4280*   4281*
TCRLF = 000200           4640    4679#
TEMP1   015266           2831*   2834*   2959#
TEMP2   015270           2832*   2833*   2836    2960#
TEND    015274           2407*   2411*   2513    2549    2572    2662    2680*   2694    2709    2804*   2962#
TESTX   023576            318    4154#
THT   = 000011           4638    4678#
TINA21  010734           2044    2056#
TINTC   016576           3145    3193#
TINTCA  017044           3208    3252#
TINTCB  017326           3269    3314#
TINTD   017704           3359    3406#
TINTDA  020134           3407    3453#
TINTE   020460           3486    3532#
TINTEA  020710           3533    3579#
TINTF   021334           3640    3687#
TINTFA  021564           3688    3734#
```

```
TINTG   022200          3795    3842#
TINTGA  022430          3843    3889#
TINTH   023562          4095    4142#
TINTI   023024          3948    3997#
TINTIA  023062          4011    4013#
TINT10  004120          1217    1249#
TINT11  004526          1266    1340#
TINT12  005204          1364    1438#
TINT13  005662          1462    1536#
TINT14  006340          1560    1634#
TINT15  007002          1653    1727#
TINT16  007460          1751    1825#
TINT17  010120          1849    1919#
TINT20  010422          1944    1987#
TINT21  010676          1998    2043#
TINT22  011210          2067    2112#
TINT31  012112          2257    2334#
TINT7   003710          1147    1201#
TKVEC = 000060           270#
TLOPC   016566          3189#   3190
TLOPG   021624          3759#   3760
TLOPGA  021632          3761#   3762
TLOPGB  021662          3770#   3771
TLOPH   023204          4059#   4060
TLOPHA  023212          4061#   4062
TLOPHB  023242          4070#   4071
TOTCRD  025432          4335*   4350*   4417    4436#
TOTERR  025430          4336*   4389*   4420    4435#
TPVEC = 000064           271#
TRACE = 000360           281#    929     2423
TRAPVE= 000034           269#    878*    879*    2979*   2980*   3022*   3023*   4164*   4165*   4274*   4275*
TRAPX   002536           916     925#
TRFLG   001254           404#    915     2375*   2413    2947*   6412*
TRP1    012404          2414    2421#
TRTRAP  001242           309     399#
TRTVEC= 000014           264#
TSTART  015272          2406*   2410*   2456    2515    2563    2569    2574    2664    2679*   2700    2706    2711    2803*
                        2961#
TSTM10  023162          3904    4043    4046#
TSTM12  022454          3903    3906#
TST1    002570           914     924     937#
TST10   003740          1215#
TST11   004136          1264#
TST12   004614          1335    1337    1339    1355    1357    1362#
TST13   005272          1433    1435    1437    1453    1455    1460#
TST14   005750          1531    1533    1535    1551    1553    1558#
TST15   006412          1629    1631    1633    1644    1646    1651#
TST16   007070          1722    1724    1726    1742    1744    1749#
TST17   007546          1820    1822    1824    1840    1842    1847#
TST2    002674           975#
TST20   010206          1918    1934    1936    1942#
TST21   010440          1996#
TST22   010752          2065#
TST23   011332          2153#
```

```
TST24   011356          2170#
TST25   011404          2187#
TST26   011434          2204#
TST27   011460          2221#
TST3    002742           982    1000#
TST30   011506          2238#
TST31   011536          2255#
TST32   012152          2352#
TST33   016112          3062#
TST34   016204          3097#
TST35   016332          3141#
TST36   017366          3335#
TST37   020146          3462#
TST4    003012          1023#
TST40   020722          3588#
TST41   021576          3743#
TST42   022454          3910#
TST43   023162          4050#
TST5    003062          1046#
TST6    003250          1074    1087    1096#
TST7    003426          1127    1145#
TTY    =%000005          280#
TYHEAD  014520          2580    2717    2811#
TYPDS = 104404          2820    2825    2873    4399    4418    4421    4860#
TYPE  = 104400           910     911     912     913     922     923     925     926    1350    1448    1546    1737    1835
                        1929    2374    2399    2592    2718    2723    2814    2815    2817    2822    2827    2871    2874
                        3008    3051    3057    3066    3067    3072    3102    3103    3104    3118    3119    3120    3187
                        3188    3310    3311    3339    3340    3341    3401    3402    3403    3465    3467    3468    3528
                        3529    3595    3596    3597    3599    3600    3682    3683    3684    3748    3749    3757    3758
                        3837    3838    3839    3912    3913    3914    3915    3920    3921    3922    4032    4033    4034
                        4035    4055    4057    4058    4137    4138    4139    4144    4194    4200    4239    4240    4305
                        4306    4309    4331    4375    4395    4396    4400    4404    4416    4419    4460    4461    4475
                        4492    4494    4497    4499    4503    4510    4541    4549    4643    4743    4820    4856#   4893
TYPOC = 104401          4483    4507    4857#
TYPON = 104403          4859#
TYPOS = 104402          1352    1450    1548    1739    1837    1931    2589    2594    2720    2725    4406    4412    4858#
T10GO   004124          1248    1251#
T31END  012152          2333    2343    2347#
XLOOP   024276          4237    4239#
$BDADR  001122           350#
$BDDAT  001126           352#     871    2972    3015    4157    4267
$BELL   001222           385#    2374    4144    4375    4541    4559
$CHARC  026414          4654*   4661    4670*   4675#
$CMTAG  001100           338#     869     876     882     883     884    2970    2977    2983    2984    2985    3013    3020
                        3026    3027    3028    4155    4162    4168    4169    4170    4265    4272    4278    4279    4280
$CM1  = 000010           368#    369#    370#    371#    372#    373#    374#    375#    376#
$CM2  = 000020           368#    369#    370#    371#    372#    373#    374#    375#    376#
$CM3  = 000010           366#    368
$CM4  = 000010           376#    377#    378#    379#    380#    381#    382#    383#    384#
$CRLF   001227           387#   4475    4494    4499    4503    4549    4559    4644    4681
$DBLK   027062          4786    4820    4828#
$DOAGN  015022          2867    2877    2885    2891#
$DTBL   027052          4789    4824#
$ENDAD  015012           303    2880    2887#   4554
```

```
$ENDCT  014740          882    2869#  2983   3026   4168   4278
$ENDMG  015114         2871    2912#
$ENULL  015131          913     923    926   2874   2915#
$EOP    014702         2844    2858#
$EOPCT  014732          882*   2866#  2870   2983*  3026*  4168*  4278*
$ERFLG  001103          341#   4536*  4559   4566   4588   4590*  4607
$ERMAX  001115          347#   4607
$ERROR  025650          876    2977   3020   4162   4272   4529#
$ERRPC  001116          348#   4481   4543*  4544*  4545   4559   6382   6384   6387   6390   6393   6396
$ERRTB  001270          426#   4489
$ERRTY  025514         4474#   4548
$ERTTL  001112          345#   4542*  4559
$FILLC  001154          364#   4647   4681
$FILLS  001153          363#   4681
$GDRDR  001120          349#
$GDDAT  001124          351#
$GET42  014762         2875#
$HD   = 000001           20     21
$ICNT   001104          342#   4596*  4597   4599*  4606
$ILLUP  027262         4867    4899#
$ITEMB  001114          346#   4478   4545*  4559
$LF     001230          388#   4559   4681
$LOOP   015106         2905    2909#
$LPADR  001106          343#    896*  2997*  3040*  4182*  4242*  4292*  4602*  4604   4606
$LPERR  001110          344#
$MAIL = ****** U        907    3008   3051   4193   4303   4551   4602   4632
$MXCNT  026202         4600    4606#
$NULL   001152          362#   4649   4681
$NWTST= 000001          934#    972#   997#  1020#  1043#  1093#  1142#  1212#  1261#  1359#  1457#  1555#  1648#
                       1746#   1844#  1939#  1993#  2062#  2150#  2167#  2184#  2201#  2218#  2235#  2252#  2349#
                       3059#   3094#  3140#  3332#  3459#  3585#  3740#  3907#  4047#
$OCNT   026642         4715*   4744*  4757#
$OMODE  026644         4710*   4714*  4719   4722*  4733*  4759#
$OVER   026166         4575    4586   4598   4603#
$PASS   001100          339#   2863*  2864*  2872   2911   4594   4607
$PWRAD  027250         4896#
$PWRDN  027126          880    2981   3024   4166   4276   4867#  4891
$PWRMG  027244         4894#
$PWRUP  027174         4876    4881#
$QUES   001226          386#   4559   4681
$RDCHR= ****** U       4861
$RDDEC= ****** U       4861
$RDLIN= ****** U       4861
$RDOCT= ****** U       4861
$REGAD  001156          366#
$REG0   001160          368#
$REG1   001162          369#
$REG2   001164          370#
$REG3   001166          371#
$REG4   001170          372#
$REG5   001172          373#
$REG6   001174          374#   4530*  6382   6384   6387   6390   6393   6396
$REG7   001176          375#   4531*  6382   6384   6387   6390   6393   6396
$RTRN   015104          884     886*   891*  2981   2906#  2985   2987*  2992*  3028   3030*  3035*  4170   4172*
```

DZCDBA.P11 CROSS REFERENCE TABLE

```
                        4177*   4280    4282*   4287*
$R2A   = ****** U       4861
$SAVRE= ****** U        4861
$SAVR6  027266          4875*   4881    4882*   4883*   4901*
$SCOPE  026024           874    2975    3018    4160    4270    4573*
$SETUP= 000037           328*    874     876     878     880     882     883     884     896    2861    2975    2977    2979
                        2981    2983    2984    2985    2997    3018    3020    3022    3024    3026    3027    3028    3040
                        4160    4162    4164    4166    4168    4169    4170    4182    4270    4272    4274    4276    4278
                        4279    4280    4292    4554
$STUP = 177777           328*
$SVLAD  026156          4583    4601*
$SVPC = 000204           301*    306
$SWR  = 176000             8*     20     384     385     883     884     896     897     938     976    1001    1024    1047
                        1097    1146    1216    1265    1363    1461    1559    1652    1750    1848    1943    1997    2066
                        2154    2171    2189    2205    2222    2239    2256    2353    2854    2862    2876    2892    2911
                        2984    2985    2997    2998    3027    3028    3040    3041    3063    3098    3142    3336    3463
                        3589    3744    3911    4051    4169    4170    4182    4183    4279    4280    4292    4293    4522
                        4523    4524    4525    4526    4539    4546    4551    4557    4559    4567    4568    4569    4570
                        4574    4586    4588    4589    4590    4591    4592    4603    4606    4897
$SWRMK= 000000          4570
$TBIT   015112           895*   2902*   2911*   2996*   3039*   4181*   4291*
$TIMES  001220           384*    883*   2862*   2984*   3027*   4169*   4279*   4591*   4597    4600*   4606
$TKB    001144           359*
$TKS    001142           358*
$TMP0   001200           376*   2506*   2507*   2508    2541*   2542*   2543    2555*   2556*   2557    2584*   2585*   2586
                        4363*   4364*   4366    4532*   6382    6384    6387    6390    6393    6396
$TMP1   001202           377*   4533*   6382    6384    6387    6390    6393    6396
$TMP2   001204           378*   4534*   6384    6390    6393
$TMP3   001206           379*   4535*   6387    6390    6393
$TMP4   001210           380*    958*    967*   2141*   2146*   2162*   2179*   2196*   2213*   2230*   2247*   2344*   2491*
                        2499*   2651*   2657*   2668*   6393    6396
$TMP5   001212           381*   2400*   2519*   2575    2712    2841*
$TMP6   001214           382*   1157*   1158*   1159    1182*   1183*   1184    1227*   1228*   1229    1276*   1277*   1278
                        1301*   1302*   1303    1315*   1316*   1317    1374*   1375*   1376    1399*   1400*   1401    1413*
                        1414*   1415    1472*   1473*   1474    1497*   1498*   1499    1511*   1512*   1513    1570*   1571*
                        1572    1595*   1596*   1597    1609*   1610*   1611    1663*   1664*   1665    1688*   1689*   1690
                        1702*   1703*   1704    1761*   1762*   1763    1786*   1787*   1788    1800*   1801*   1802    1859*
                        1860*   1861    1884*   1885*   1886    1898*   1899*   1900    1954*   1955*   1956    2008*   2009*
                        2010    2033*   2034*   2035    2077*   2078*   2079    2102*   2103*   2104    2267*   2268*   2269
                        2292*   2293*   2294    2306*   2307*   2308    2440*   2441*   2442    3155*   3156*   3157    3180*
                        3181*   3182    3218*   3219*   3220    3243*   3244*   3245    3279*   3280*   3281    3304*   3305*
                        3306    3369*   3370*   3371    3394*   3395*   3396    3417*   3418*   3419    3442*   3443*   3444
                        3496*   3497*   3498    3521*   3522*   3523    3543*   3544*   3545    3568*   3569*   3570    3650*
                        3651*   3652    3675*   3676*   3677    3698*   3699*   3700    3723*   3724*   3725    3805*   3806*
                        3807    3830*   3831*   3832    3853*   3854*   3855    3878*   3879*   3880    3959*   3960*   3961
                        3984*   3985*   3986    4105*   4106*   4107    4130*   4131*   4132    4214*   4215*   4216    4231*
                        4232*   4233
$TMP7   001216           383*
$TN   = 000044            20*    934     938*    972     976*    997    1001*   1020    1024*   1043    1047*   1093    1097*
                        1142    1146*   1212    1216*   1261    1265*   1359    1363*   1457    1461*   1555    1559*   1648
                        1652*   1746    1750*   1844    1848*   1939    1943*   1993    1997*   2062    2066*   2150    2154*
                        2167    2171*   2184    2188*   2201    2205*   2218    2222*   2235    2239*   2252    2256*   2349
                        2353*   3059    3063*   3094    3098*   3140    3142*   3332    3336*   3459    3463*   3585    3589*
                        3740    3744*   3907    3911*   4047    4051*
```

DZCDBA.P11 CROSS REFERENCE TABLE

```
$TPB     001150            361#  4667*  4681
$TPFLG   001155            365#  4626   4681
$TPS     001146            360#  4665   4681
$TRAP    027072            878   2979   3022   4164   4274   4839#
$TRP   = 000005           4847#  4857#  4858#  4859#  4860#  4861#
$TRPAD   027174           4844   4855#
$TSTNM   001102            340#  2861*  4538   4559   4566   4601*  4603   4607
$TYPBN=  ****** U         4861
$TYPDS   026646           4774#  4860
$TYPE    026204           4626#  4847   4856
$TYPEC   026350           4646   4653   4660   4665#  4666
$TYPEX   026416           4671   4673   4676#
$TYPOC   026444           4713#  4857
$TYPON   026460           4712   4715#  4859
$TYPOS   026420           4708#  4858
$XTSTR   026034           4577#
$OFILL   026643           4709*  4713*  4723   4758#
$40CAT=  ****** U         4548   4574
.      = 043770            286#   290#   301    302#   304#   306#   308#   314#   317#   321#   325#   337#   389
                           872    896   2042   2111   2911   2916   2973   2997   3016   3040   3250   3312   3404
                          3451   3530   3577   3685   3732   3840   3887   3994   4140   4158   4182   4268   4292
                          4513#  4559   4606   4607   4681   4828#  4878   4900   5678#
```

```
ADITAG   329#  390
COMMEN     6#  273#  2379  6420  6422  6424
ENDCOM     6#  273#  2386  6431  6433  6435
ERROR    173#  942   946   950   960   969   981   988   994   1004  1008  1013  1017  1027  1031
        1036  1040  1069  1073  1083  1086  1090  1106  1126  1135  1139  1199  1203  1207  1249
        1338  1342  1358  1436  1440  1456  1534  1538  1554  1632  1636  1647  1725  1729  1745
        1823  1827  1843  1917  1921  1937  1987  2057  2117  2121  2125  2129  2133  2137  2142
        2147  2163  2180  2197  2214  2231  2248  2331  2336  2345  2363  2480  2492  2500  2606
        2613  2618  2624  2628  2632  2636  2640  2643  2652  2658  2736  2743  2746  2752  2758
        2763  2767  2771  2775  2778  2926  2930  2934  2942  3079  3083  3087  3091  3108  3112
        3116  3125  3129  3133  3137  3193  3198  3202  3206  3255  3259  3263  3267  3317  3321
        3325  3329  3345  3349  3353  3357  3456  3472  3476  3480  3484  3582  3604  3610  3619
        3623  3627  3634  3638  3737  3765  3774  3778  3782  3789  3793  3892  3929  3934  3939
        3943  4001  4005  4009  4017  4021  4025  4030  4044  4065  4074  4078  4082  4089  4093
        4386  4452
ESCAPE   273#
GETPRI     5#  1052  1109  1149  1164  1174  1219  1234  1268  1283  1293  1307  1366  1381  1391
        1405  1464  1479  1489  1503  1562  1577  1587  1601  1655  1670  1680  1694  1753  1768
        1778  1792  1851  1866  1876  1890  1946  1961  2000  2015  2025  2069  2084  2094  2259
        2274  2284  2298  2432  2447  3147  3162  3172  3210  3225  3235  3271  3286  3296  3361
        3376  3386  3409  3424  3434  3488  3503  3513  3535  3550  3560  3642  3657  3667  3690
        3705  3715  3797  3812  3822  3845  3860  3870  3951  3966  3976  4097  4112  4122  4206
        4223
INT      1261#  1359  1457  1555  1648  1746  1844
MEOP     2847#  2859
MULT      273#
NEWTST     6#   273#   934   972   997  1020  1043  1093  1142  1212  1261  1359  1457  1555  1648
        1746  1844  1939  1993  2062  2150  2167  2184  2201  2218  2235  2252  2349  3059  3094
        3140  3332  3459  3585  3740  3907  4047
POP       273#  4815  4885
PRIORA    160#  1051  1108
PRIORB    161#  1148  1218  1267  1365  1463  1561  1654  1752  1850  1945  1999  2068  2258  3146
        3209  3270  3360  3408  3487  3534  3641  3689  3796  3844  3949  4096
PRIORC    162#  1163  1233  1282  1380  1478  1576  1669  1767  1865  1960  2014  2083  2273  2446
        3161  3224  3285  3375  3423  3502  3549  3656  3704  3811  3859  3965  4111
PRIORD    163#  1173  1292  1390  1488  1586  1679  1777  1875  2024  2093  2283  2431  3171  3234
        3295  3385  3433  3512  3559  3666  3714  3821  3869  3975  4121
PRIORE    164#  1193  1326  1424  1522  1620  1713  1811  1909  1980  2050  2320
PRIORF    165#
PRIORH    166#  4205
PRIORI    167#  4221
PUSH      273#  4774  4869
SAVE     4465#  4530
SCOPE     174#   937   975  1000  1023  1046  1096  1145  1215  1264  1362  1460  1558  1651  1749
        1847  1942  1996  2065  2153  2170  2187  2204  2221  2238  2255  2352  2371  3062  3097
        3141  3335  3462  3588  3743  3910  4050  4143
SETPRI     4#   917   929  1061  1077  1118  1128  1159  1184  1194  1229  1278  1303  1317  1327
        1376  1401  1415  1425  1474  1499  1513  1523  1572  1597  1611  1621  1665  1690  1704
        1714  1763  1788  1802  1812  1861  1886  1900  1910  1956  1970  1981  2010  2035  2045
        2051  2079  2104  2269  2294  2308  2321  2415  2423  2442  3157  3182  3220  3245  3281
        3306  3371  3396  3419  3444  3498  3523  3545  3570  3652  3677  3700  3725  3807  3832
        3855  3880  3961  3986  4107  4132  4216  4233  6413
SETTRA   4847#  4857  4658  4859  4860
SETUP     273#   868  2969  3012  4154  4264
```

```
SKIP      273#
SLASH     273#
SPACE     273#
STARS       4#    139     157     273#    297     330     389     934     936     972     974     997     999    1020    1022
           1043   1045    1093    1095    1142    1144    1212    1214    1261    1263    1359    1361    1457    1459    1555
           1557   1648    1650    1746    1748    1844    1846    1939    1941    1993    1995    2062    2064    2150    2152
           2167   2169    2184    2186    2201    2203    2218    2220    2235    2237    2252    2254    2349    2351    2848
           3059   3061    3094    3096    3140    3332    3334    3459    3461    3585    3587    3740    3742    3907    3909
           4047   4049    4466    4515    4560    4608    4682    4761    4830    4862    6401    6403    6419    6421    6423
           6432   6434    6436
SWSS       897#  2998#   3041#   4183#   4293#
TCMTBP    4847#
TYPBIN    273#
TYPDEC    273#  2872
TYPNUM    273#
TYPOCS    273#
TYPOCT    273#  4481    4505
TYPTXT    273#
$$CMRE    330#   368     369     370     371     372     373     374     375
$$CMTH    330#   376     377     378     379     380     381     382     383
$$ESCA    273#
$$NEWT    273#   934     972     997    1020    1043    1093    1142    1212    1261    1359    1457    1555    1648    1746
           1844   1939    1993    2062    2150    2167    2184    2201    2218    2235    2252    2349    3059    3094    3140
           3332   3459    3585    3740    3907    4047
$$SET     4847#  4857    4858    4859    4860
$$SETU     884#  2985#   3028#   4170#   4280#
$$SKIP    273#
.EQUAT      5#   168
.HEADE      4#    10
.SETUP      5#   328
.SPCT1      6#   297
.SCATC      4#   283
.SCMTA      4#   330
.SEOP       6#  2848
.SERRO      4#  4515
.SERRT      4#  4466
.SPDME      5#  4862
.SSCOP      6#  4560
.STRAP      5#  4830
.SUTYP      6#  4761
.SUTYPE     5#  4609
.SUTYPO     5#  4682
```

```
ADC      893  2519  2548  2565  2571  2575  2576  2668  2682  2693  2702  2708  2712  2713  2795
        2803  2804  2805  2934  2994  3037  4179  4199  4289  4489  4636  4711  4721  4794
ASL     4486  4487  4488  4843
ASLB    4799
BCC     4326  4800
BEQ      941   945   949   957   966   980   987   993  1003  1007  1012  1016  1026  1030  1035
        1039  1072  1089  1105  1335  1433  1531  1629  1722  1820  2136  2140  2145  2161  2178
        2195  2212  2229  2246  2343  2373  2405  2464  2470  2482  2490  2498  2517  2610  2623
        2627  2631  2635  2639  2647  2650  2656  2666  2740  2749  2762  2766  2770  2774  2877
        2885  2918  2923  2933  2949  3090  3115  3128  3136  3190  3205  3266  3320  3328  3356
        3455  3483  3581  3607  3609  3637  3736  3760  3762  3764  3792  3891  3903  3919  3928
        3933  3938  4000  4004  4039  4043  4060  4062  4064  4092  4204  4340  4374  4377  4381
        4451  4491  4496  4509  4537  4540  4589  4595  4639  4738
BGE     2617  2844  4598  4673
BGT     2564  2570  2701  2707  2794  2867  4385  4745  4808
BHI     1193  1198  1302  1400  1498  1596  1689  1787  1885  2034  2103  2293  2441  2507  2542
        2556  2585  2683  2864  2899  3181  3244  3305  3395  3443  3522  3569  3676  3724  3831
        3879  3985  4131  4215  4314  4364  4735  4897
BIC      978  1010  1033  1158  1228  1277  1316  1375  1414  1473  1512  1571  1610  1664  1703
        1762  1801  1860  1899  1955  2009  2078  2268  2307  2807  2904  3156  3219  3280  3370
        3418  3497  3544  3651  3699  3806  3854  3960  4106  4232  4343  4740  4741  4802  4803
BICB    4328  4478
BIS      927  1071  1088  1104  2123  2127  2131  2135  2372  2404  2421  2463  2465  2469  2472
        2481  2485  2528  2578  2609  2611  2622  2626  2630  2634  2638  2641  2646  2677  2715
        2739  2741  2744  2748  2750  2761  2765  2769  2773  2776  2789  2900  2917  2922  2928
        2932  2940  2948  3085  3089  3106  3114  3123  3127  3135  3189  3204  3257  3265  3315
        3319  3327  3343  3351  3355  3470  3478  3482  3602  3606  3617  3625  3632  3636  3759
        3761  3772  3780  3787  3791  3918  3927  3932  3937  3999  4003  4015  4019  4023  4039
        4042  4059  4061  4072  4080  4087  4091  4203  4339  4341  4373  4376  4380  4390  4430
        4457  4539  4546  4574  4592
BITB    4661
BLE     2550  2695
BLO     2756  4652  4746  4791  4807
BLOS    1082  1123  1134  1202  1337  1341  1348  1435  1439  1446  1533  1537  1544  1631  1635
        1642  1724  1728  1735  1822  1826  1833  1920  1927  2116  2120  2335  2479  2505  2514
        2540  2554  2583  2605  2663  2735  2786  2835  2903  2925  3111  3132  3197  3201  3254
        3262  3324  3348  3475  3622  3777  4029  4077  4354  4798
BMI      872   916   928  1076  1125  1979  2124  2128  2132  2414  2422  2466  2473  2486  2509
        2512  2521  2529  2535  2544  2557  2558  2561  2573  2579  2612  2642  2661  2670  2678
        2688  2692  2698  2710  2716  2742  2745  2751  2777  2790  2812  2901  2929  2941  2973
        3016  3078  3082  3086  3107  3124  3258  3316  3344  3352  3471  3479  3603  3618  3626
        3633  3773  3781  3788  4016  4020  4024  4073  4081  4088  4158  4268  4330  4342  4358
        4361  4367  4370  4391  4393  4428  4431  4458  4479  4501  4547  4555  4575  4593  4633
        4641  4648  4662  4669  4736  4796  4884
BNE      953  1068  1085  1138  1192  1206  1247  1325  1357  1423  1455  1521  1553  1619  1646
        1712  1744  1810  1842  1908  1936  2319  2361  2599  2730  3616  3630  3771  3795  3942
        4008  4071  4085  4352  4356  4383  4403  4423  4448  4552  4627  4666  4734  4782  4812
BPL      892   901   914   924   962   982  1074  1087  1127  1200  1248  1339  1355  1437  1453
        1535  1551  1633  1644  1726  1742  1824  1840  1918  1934  1986  2042  2055  2111  2362
        2409  2420  2475  2487  2510  2524  2545  2559  2566  2587  2607  2614  2619  2673  2703
        2732  2737  2753  2788  2792  2881  2920  2938  2993  3002  3036  3045  3191  3250  3312
        3404  3451  3530  3577  3685  3732  3840  3887  3994  4012  4140  4179  4187  4220  4288
        4297  4362  4371  4378  4387  4410  4463  4484  4511  4577  4583  4586  4629  4645  4655
        4664  4671  4712  4727  4748  4793  4810  4878  4900
```

```
C.9      870   883   888   895   985  1052  1065  1100  1107  1109  1149  1164  1174  1208  1210
        1219  1234  1251  1253  1268  1283  1293  1307  1331  1333  1343  1345  1366  1381  1391
        1405  1429  1431  1441  1443  1464  1479  1489  1503  1527  1529  1539  1541  1562  1577
        1587  1601  1625  1627  1637  1639  1655  1670  1680  1694  1718  1720  1730  1732  1753
        1768  1778  1792  1816  1818  1828  1830  1851  1866  1876  1890  1914  1916  1922  1924
        1946  1961  1977  1985  1989  1990  2000  2015  2025  2058  2059  2069  2084  2094  2113
        2154  2171  2179  2188  2205  2222  2230  2239  2259  2274  2284  2298  2327  2329  2337
        2339  2368  2400  2401  2402  2403  2432  2447  2474  2491  2577  2651  2714  2840  2841
        2861  2862  2879  2892  2971  2984  2989  2996  3010  3014  3027  3032  3039  3147  3162
        3172  3210  3225  3235  3271  3286  3296  3361  3376  3386  3409  3424  3434  3488  3503
        3513  3535  3550  3560  3642  3657  3667  3690  3705  3715  3797  3812  3822  3845  3860
        3870  3951  3966  3976  4097  4112  4122  4156  4169  4174  4181  4206  4223  4266  4279
        4284  4291  4316  4335  4336  4337  4345  4477  4591  4725  4785  4789  4882  6410  6411
        6412
C.B3    4338  4590  4670  4814
C.F      871   904   940   955   963   979   986   992  1002  1006  1015  1025  1029  1038  1204
        1250  1336  1346  1356  1434  1444  1454  1532  1542  1552  1630  1640  1645  1723  1733
        1743  1821  1831  1841  1925  1935  1988  2043  2056  2112  2139  2144  2159  2194  2210
        2245  2341  2342  2365  2497  2508  2511  2513  2520  2543  2546  2549  2557  2560  2563
        2569  2572  2597  2655  2662  2669  2694  2700  2706  2709  2836  2843  2860  2944  2953
        2972  3005  3015  3048  3252  3314  3406  3453  3454  3532  3579  3580  3608  3687  3734
        3735  3763  3842  3889  3890  3997  4013  4063  4142  4157  4190  4267  4300  4360  4366
        4369  4427  4450  4554  4584  4597  4806
CMPB    2660  2691  2697  2728  4357  4384  4638  4640  4647  4668  4672
COM     2375  2902  2947
COMB    4344
DEC     1124  2821  2826  2865  4329  4401  4485
DECB    4651  4654  4733  4744
EMT      173
MCLT     290  2600  2731  2919  3075  3105  3121  3342  3469  3601  3916  3924  4036  4141  4197
        4202  4312  4333  4424  4462  4553  4556  4628  4877  4899
INC     1066  1075  1103  1978  2359  2468  2516  2518  2537  2665  2667  2690  2798  2913  2919
        2823  2833  2842  2863  3076  3249  3450  3576  3614  3731  3769  3986  3993  4069  4327
        4349  4350  4359  4368  4389  4394  4397  4425  4542  4596  4739  4747  4792  4583
INCB    4536  4601  4674
INCF     174
JMP      295   315   318   322   326  2333  2376  2483  2488  2531  2601  2620  2644  2648  2684
        2757  2759  2779  2910  2950  2951  2954  3011  3904  4145  4244  4429  4432  4903
JSR      909   938  1048  1099  1146  1216  1265  1363  1461  1559  1652  1750  1848  1943  1997
        2066  2256  2353  2427  2467  2522  2526  2530  2580  2616  2671  2675  2717  2755  2793
        2887  3056  3065  3101  3144  3338  3464  3594  3747  3911  3923  4054  4193  4308  4334
        4446  4548  4646  4653  4660
MOV      869   873   874   875   876   877   878   879   880   881   882   884   885   886   897
        889   891   894   896   897   898   899   902   903   905   906   907   919   919   929
        930   958   967   991  1001  1024  1049  1050  1053  1054  1056  1057  1059  1060  1061
       1062  1077  1078  1101  1102  1110  1111  1113  1114  1116  1117  1118  1119  1129  1130
       1147  1150  1151  1153  1154  1156  1157  1159  1160  1165  1166  1168  1169  1171  1172
       1175  1176  1178  1179  1181  1182  1184  1185  1188  1189  1190  1194  1195  1209  1217
       1220  1221  1223  1224  1226  1227  1229  1230  1235  1236  1238  1239  1241  1242  1243
       1244  1245  1252  1266  1269  1270  1272  1273  1275  1276  1278  1279  1284  1285  1287
       1288  1290  1291  1294  1295  1297  1298  1300  1301  1303  1304  1308  1309  1311  1312
       1314  1315  1317  1318  1321  1322  1323  1327  1328  1332  1344  1349  1351  1364  1367
       1368  1370  1371  1373  1374  1376  1377  1382  1383  1385  1386  1398  1389  1392  1393
       1395  1396  1398  1399  1401  1402  1406  1407  1409  1410  1412  1413  1415  1416  1419
```

1420 1421 1425 1426 1430 1442 1447 1449 1462 1465 1466 1468 1469 1471 1472
1474 1475 1480 1481 1483 1484 1486 1487 1490 1491 1493 1494 1496 1497 1499
1500 1504 1505 1507 1508 1510 1511 1513 1514 1517 1518 1519 1523 1524 1528
1540 1545 1547 1560 1563 1564 1566 1567 1569 1570 1572 1573 1578 1579 1581
1582 1584 1585 1588 1589 1591 1592 1594 1595 1597 1598 1602 1603 1605 1606
1608 1609 1611 1612 1615 1616 1617 1621 1622 1626 1638 1643 1653 1656 1657
1659 1660 1662 1663 1665 1666 1671 1672 1674 1675 1677 1678 1681 1682 1684
1685 1687 1688 1690 1691 1695 1696 1698 1699 1701 1702 1704 1705 1708 1709
1710 1714 1715 1719 1731 1736 1738 1751 1754 1755 1757 1758 1760 1761 1763
1764 1769 1770 1772 1773 1775 1776 1779 1780 1782 1783 1785 1786 1788 1789
1793 1794 1796 1797 1799 1800 1802 1803 1806 1807 1808 1812 1813 1817 1829
1834 1836 1849 1852 1853 1855 1856 1858 1859 1861 1862 1867 1868 1870 1871
1873 1874 1877 1878 1880 1881 1883 1884 1886 1887 1891 1892 1894 1895 1897
1898 1900 1901 1904 1905 1906 1910 1911 1915 1923 1928 1930 1944 1947 1948
1950 1951 1953 1954 1956 1957 1962 1963 1965 1966 1968 1969 1970 1971 1974
1975 1976 1982 1982 1991 1998 2001 2002 2004 2005 2007 2008 2010 2011 2016
2017 2019 2020 2022 2023 2026 2027 2029 2030 2032 2033 2035 2036 2039 2040
2041 2044 2045 2046 2051 2052 2060 2067 2070 2071 2073 2074 2076 2077 2079
2080 2085 2086 2088 2089 2091 2093 2095 2096 2098 2099 2101 2102 2104 2105
2108 2109 2110 2114 2141 2146 2151 2162 2173 2190 2196 2207 2213 2224 2247
2247 2257 2260 2261 2263 2264 2266 2267 2269 2270 2275 2276 2278 2279 2282
2282 2285 2286 2288 2289 2291 2293 2294 2295 2299 2300 2302 2303 2305 2306
2308 2309 2312 2315 2317 2321 2322 2328 2338 2344 2354 2355 2357 2358 2367
2406 2407 2408 2410 2411 2412 2416 2417 2423 2424 2430 2433 2434 2436 2437
2439 2440 2442 2443 2448 2449 2451 2452 2454 2455 2456 2457 2458 2459 2460
2461 2462 2471 2494 2499 2502 2505 2515 2541 2555 2574 2584 2586 2588 2593
2653 2657 2659 2664 2711 2747 2787 2791 2795 2796 2797 2819 2824 2831 2832
2868 2872 2876 2880 2884 2893 2894 2897 2898 2905 2936 2970 2974 2975 2976
2977 2978 2979 2980 2981 2982 2983 2985 2986 2987 2988 2990 2992 2995 2997
2998 2999 3000 3003 3004 3006 3007 3013 3017 3018 3019 3020 3021 3022 3023
3024 3025 3026 3028 3029 3030 3031 3033 3035 3038 3040 3041 3042 3043 3046
3047 3049 3050 3053 3054 3073 3074 3145 3148 3149 3151 3152 3154 3155 3157
3158 3163 3164 3166 3167 3169 3170 3173 3174 3176 3177 3179 3180 3182 3183
3186 3208 3211 3212 3214 3215 3217 3218 3220 3221 3226 3227 3229 3230 3232
3233 3236 3237 3239 3240 3242 3243 3245 3246 3269 3272 3273 3275 3276 3278
3279 3281 3282 3287 3288 3290 3291 3293 3294 3297 3298 3300 3301 3303 3304
3306 3307 3359 3362 3363 3365 3366 3368 3369 3371 3372 3377 3378 3380 3381
3383 3384 3387 3388 3390 3391 3393 3394 3396 3397 3400 3407 3410 3411 3413
3414 3416 3417 3419 3420 3425 3426 3428 3429 3431 3432 3435 3436 3438 3439
3441 3442 3444 3445 3448 3449 3486 3489 3490 3492 3493 3495 3496 3498 3499
3504 3505 3507 3508 3510 3511 3514 3515 3517 3518 3520 3521 3523 3524 3527
3533 3536 3537 3539 3540 3542 3543 3545 3546 3551 3552 3554 3555 3557 3559
3561 3562 3564 3565 3567 3568 3570 3571 3574 3575 3612 3613 3640 3643 3644
3646 3647 3649 3650 3652 3653 3658 3659 3661 3662 3664 3665 3668 3669 3671
3672 3674 3675 3677 3678 3681 3688 3691 3692 3694 3695 3697 3698 3700 3701
3706 3707 3709 3710 3712 3713 3716 3717 3719 3720 3722 3723 3725 3726 3729
3730 3767 3768 3795 3798 3799 3801 3802 3804 3805 3807 3808 3813 3814 3816
3817 3819 3820 3823 3824 3826 3827 3829 3830 3832 3833 3836 3843 3846 3847
3849 3850 3852 3853 3855 3856 3861 3862 3864 3865 3867 3868 3871 3872 3874
3875 3877 3878 3880 3881 3884 3885 3948 3952 3953 3955 3956 3958 3959 3961
3962 3967 3968 3970 3971 3973 3974 3977 3978 3980 3981 3983 3984 3986 3987
3990 3991 3992 4011 4067 4068 4095 4098 4099 4101 4102 4104 4105 4107 4108
4113 4114 4116 4117 4119 4120 4123 4124 4126 4127 4129 4130 4132 4133 4136
4155 4159 4160 4161 4162 4163 4164 4165 4166 4167 4168 4170 4171 4172 4173

	4175	4177	4180	4182	4183	4184	4185	4188	4189	4191	4192	4198	4207	4208	4210
	4211	4213	4214	4216	4217	4224	4225	4227	4228	4230	4231	4233	4234	4237	4242
	4265	4269	4270	4271	4272	4273	4274	4275	4276	4277	4278	4280	4281	4282	4283
	4285	4287	4290	4292	4293	4294	4295	4298	4299	4301	4302	4303	4313	4315	4324
	4346	4347	4348	4363	4398	4411	4417	4420	4449	4476	4481	4490	4495	4500	4502
	4506	4530	4531	4532	4533	4534	4535	4538	4543	4579	4580	4582	4585	4599	4600
	4602	4603	4604	4630	4631	4635	4649	4708	4716	4717	4718	4724	4731	4749	4750
	4751	4752	4753	4775	4776	4777	4778	4779	4780	4781	4786	4789	4809	4815	4816
	4817	4818	4819	4821	4822	4839	4840	4844	4867	4868	4869	4870	4871	4872	4873
	4874	4875	4876	4881	4885	4886	4887	4888	4889	4890	4891	4892	4895	6405	6406
	6407	6408	6409	6413	6414										
MOVB	2157	2174	2208	2225	2719	2724	4405	4545	4632	4659	4667	4709	4710	4713	4714
	4715	4719	4722	4723	4742	4784	4787	4801	4804	4813	4842				
NEG	2192	2243	4720	4783											
NOP	2049	2888	2889	2890											
RESET	939	2878	2886												
ROL	4726	4728	4729	4730	4732										
ROLB	4318	4320	4321	4322	4323										
ROR	4317	4325													
RORB	4319														
RTI	399	886	920	931	1058	1063	1079	1115	1120	1131	1155	1161	1170	1180	1186
	1196	1225	1231	1240	1274	1280	1289	1299	1305	1313	1319	1329	1372	1378	1387
	1397	1403	1411	1417	1427	1470	1476	1485	1495	1501	1509	1515	1525	1568	1574
	1583	1593	1599	1607	1613	1623	1661	1667	1676	1686	1692	1700	1706	1716	1759
	1765	1774	1784	1790	1798	1804	1914	1857	1863	1872	1882	1888	1896	1902	1912
	1952	1958	1967	1972	1983	2006	2012	2021	2031	2037	2047	2053	2075	2081	2090
	2100	2106	2265	2271	2280	2290	2296	2304	2310	2323	2418	2425	2438	2444	2453
	2799	2906	2987	3030	3153	3159	3168	3178	3184	3194	3216	3222	3231	3241	3247
	3277	3283	3292	3302	3306	3367	3373	3382	3392	3398	3415	3421	3430	3440	3446
	3494	3500	3509	3519	3525	3541	3547	3556	3566	3572	3648	3654	3663	3673	3679
	3696	3702	3711	3721	3727	3803	3809	3818	3828	3834	3851	3857	3866	3876	3882
	3957	3963	3972	3982	3988	4103	4109	4118	4126	4134	4172	4212	4218	4229	4235
	4282	4558	4605	4637	4754	4823	4898	6415							
RTS	2808	2828	2837	2845	4453	4459	4504	4676	4845	6417					
SBC	890	891	2991	2992	3034	3035	4176	4177	4286	4287					
SUB	2495	2496	2551	2562	2568	2654	2679	2680	2681	2696	2699	2705	2806	4544	4790
SWAB	1055	1112	1152	1167	1177	1222	1237	1271	1286	1296	1310	1369	1384	1394	1408
	1467	1482	1492	1506	1565	1580	1590	1604	1658	1673	1683	1697	1756	1771	1781
	1795	1854	1869	1879	1893	1949	1964	2003	2018	2028	2072	2087	2097	2262	2277
	2287	2301	2435	2450	2895	3150	3165	3175	3213	3228	3238	3274	3299	3299	3364
	3379	3389	3412	3427	3437	3491	3506	3516	3538	3553	3563	3645	3660	3670	3693
	3708	3718	3800	3815	3825	3848	3863	3873	3954	3969	3979	4100	4115	4125	4209
	4226	4847	4857	4858	4859	4860									
TST	900	915	944	948	952	1011	1034	1084	1137	1205	1334	1347	1432	1445	1530
	1543	1628	1641	1721	1734	1819	1832	1926	2119	2176	2227	2413	2489	2503	2523
	2527	2534	2536	2538	2552	2581	2598	2649	2687	2729	2811	2859	2896	2924	3001
	3044	3081	3110	3131	3200	3261	3323	3347	3474	3621	3629	3776	3784	3902	3941
	4007	4028	4076	4084	4186	4296	4353	4355	4382	4392	4402	4415	4422	4508	4551
	4581	4594	4634	4642	4663	4737	4795	4805	4841						
TSTB	1067	1081	1122	1133	1191	1201	1246	1324	1340	1422	1438	1520	1536	1618	1634
	1711	1727	1809	1825	1907	1919	2115	2318	2334	2360	2478	2672	2676	2589	3077
	3196	3253	3615	3770	4070	4351	4409	4447	4588	4626	4665	4797	4811		
WAIT	2937														
.ASCII	386	387	5253	5255	5265	5270	5276	5283	5287	5302	5398	5410	5421	5431	5440

	5446	5456	5463	5488	5497	5526	5535	5573	5583	5531	5600	5614	5622	5631	5645
	5658	5666	5683	5695	5708	5[illegible]	5740	5751	5763	5774	5784	5814	5826	5837	5899
	5911	5926	5937	5948	5958	5969	5985	6035	6069	6082	6095	6109	6122	6136	6149
	6219	6239	6253	6265	6321	6342	6363								
.ASCIZ	385	388	2912	4512	5254	5256	5258	5294	5310	5319	5324	5329	5337	5346	5355
	5363	5368	5375	5380	5385	5392	5405	5419	5471	5477	5481	5505	55.1	5519	5521
	5523	5542	5551	5556	5562	5568	5608	5639	5652	5672	5690	5703	5715	5720	5734
	5747	5758	5770	5780	5791	5797	5805	5822	5832	5844	5853	5858	5866	5875	588:
	5890	5907	5918	5933	5944	5955	5965	5976	5992	5998	6007	6015	6025	6042	6047
	6058	6077	6090	6104	6118	6131	6145	6158	6165	6176	6183	6190	6200	6209	6227
	6231	6247	6259	6273	6278	6289	6296	6304	6312	6332	6353	6371			
.E[illegible]	4828														
.E[illegible]	340	341	346	347	362	363	364	365	1353	1354	1451	1452	1549	1550	1740
	1741	1838	1839	1932	1933	2590	2591	2595	2596	2721	2722	2726	2727	2915	4407
	4408	4413	4414	4438	4439	4755	4756	4757	4758	5004	5005	5006	5007	5008	5009
	5010	5011	5012	5013	5014	5015	5016	5017	5018	5019	5020	5021	5022	5023	5024
	5025	5026	5027	5028	5029	5030	5031	5032	5033	5034	5035	5036	5037	5038	5039
	5040	5041	5042	5043	5044	5045	5046	5047	5048	5049	5050	5051	5052	5053	5054
	5055	5056	5057	5058	5059	5060	5061	5062	5063	5064	5065	5066	5067	5068	5069
	5070	5071	5072	5073	5074	5075	5076	5077	5078	5079	5080	5081	5082	5083	5172
	5173	5174	5175	5176	5177	5178	5179	5180	5181	5182	5183	5184	5185	5186	5187
	5188	5189	5190	5191	5192	5193	5194	5195	5196	5197	5198	5199	5200	5201	5202
	5203	5204	5205	5206	5207	5208	5209	5210	5211	5212	5213	5214	5215	5216	5217
	5218	5219	5220	5221	5222	5223	5224	5225	5226	5227	5228	5229	5230	5231	5232
	5233	523[illegible]	5235	5236	5237	5238	5239	5240	5241	5242	5243	5244	5245	5246	5247
	5248	5249	5250	5251											
.ENABL	3														
.END	6439														
.ENDC	15	140	158	173	259	273	296	298	304	306	328	331	338	340	366
	376	384	385	386	390	411	873	874	876	878	880	882	883	884	896
	897	907	935	936	937	938	972	974	975	976	998	999	1000	1001	1021
	1022	1023	1024	1044	1045	1046	1047	1094	1095	1096	1097	1143	1144	1145	1146
	1213	1214	1215	1216	1262	1263	1264	1265	1339	1355	1360	1361	1362	1363	1437
	1453	1458	1459	1460	1461	1535	1551	1556	1557	1558	1559	1633	1644	1649	1650
	1651	1652	1726	1742	1747	1748	1749	1750	1824	1840	1845	1846	1847	1848	1917
	1918	1934	1940	1941	1942	1943	1994	1995	1996	1997	2063	2064	2065	2066	2151
	2152	2153	2154	2168	2169	2170	2171	2185	2186	2187	2188	2202	2203	2204	2205
	2219	2220	2221	2222	2236	2237	2238	2239	2253	2254	2255	2256	2350	2351	2352
	2353	2382	2388	2849	2852	2853	2854	2855	2857	2861	2867	2870	2871	2875	2883
	2910	2911	2912	2915	2916	2974	2975	2977	2979	2981	2983	2984	2985	2997	2998
	3008	3017	3018	3020	3022	3024	3026	3027	3028	3040	3041	3051	3060	3061	3062
	3053	3095	3096	3097	3098	3141	3142	3333	3334	3335	3336	3460	3461	3462	3463
	3586	3587	3588	3589	3741	3742	3743	3744	3[illegible]8	3909	3910	3911	4048	4049	4050
	4051	4159	4160	4162	4164	4166	4168	4169	4170	4182	4183	4193	4269	4270	4272
	4274	4276	4278	4279	4280	4292	4293	4303	4467	4485	4514	4516	4522	4536	4543
	4548	4549	4550	4551	4557	4558	4559	4561	4567	4570	4574	4576	4597	4598	4590
	4592	4596	4601	4602	4603	4606	4607	4609	4632	4683	4762	4831	4840	4843	4856
	4857	4858	4859	4860	4861	4863	4875	4885	4895	4897	4898	4902	6402	6404	6420
	6421	6422	6423	6424	6425	6431	6433	6435	6437						
.EQUIV	173	174	176	191	192	221	222	223	224	225	226	227	228	229	230
	249	250	251	252	253	254	255	256	257	258					
.EVEN	4513	5678	6378												
.IF	11	139	157	171	231	259	293	297	302	304	328	330	337	339	366
	376	384	385	389	390	869	873	874	876	878	880	882	883	884	896

```
                907   934   936   938   972   974   976   997   999  1001  1020  1022  1024  1043  1045
               1047  1093  1095  1097  1142  1144  1146  1212  1214  1216  1261  1263  1265  1359  1361
               1363  1457  1459  1461  1555  1557  1559  1648  1650  1652  1746  1748  1750  1844  1846
               1848  1939  1941  1943  1993  1995  1997  2062  2064  2066  2150  2152  2154  2167  2169
               2171  2184  2186  2188  2201  2203  2205  2218  2220  2222  2235  2237  2239  2252  2254
               2256  2349  2351  2353  2380  2386  2848  2852  2853  2854  2856  2857  2859  2866  2869
               2871  2875  2876  2892  2910  2911  2912  2970  2974  2975  2977  2979  2981  2983  2984
               2985  2997  3008  3013  3017  3018  3020  3022  3024  3026  3027  3028  3040  3051  3059
               3061  3063  3094  3096  3098  3140  3142  3332  3334  3336  3459  3461  3463  3585  3587
               3589  3740  3742  3744  3907  3909  3911  4047  4049  4051  4155  4153  4160  4162  4164
               4166  4168  4169  4170  4182  4193  4265  4269  4270  4272  4274  4276  4278  4279  4280
               4292  4303  4466  4484  4500  4515  4521  4530  4539  4546  4548  4549  4551  4554  4557
               4558  4559  4560  4566  4570  4574  4586  4588  4589  4590  4592  4594  4602  4603  4605
               4606  4607  4608  4632  4682  4761  4830  4839  4843  4847  4857  4858  4859  4860  4861
               4862  4875  4885  4893  4895  4897  4902  6401  6403  6419  6421  6423  6425  6431  6432
               6433  6434  6435  6436
.IFEQ          1339  1437  1535  1633  1726  1824  1917
.IFF            140   158   171   298   304   331   337   339   366   390   873   935   936   937   938
                973   974   975   976   998   999  1000  1001  1021  1022  1023  1024  1044  1045  1046
               1047  1094  1095  1096  1097  1143  1144  1145  1146  1213  1214  1215  1216  1262  1263
               1264  1265  1360  1361  1362  1363  1458  1459  1460  1461  1556  1557  1558  1559  1649
               1650  1651  1652  1747  1748  1749  1750  1845  1846  1847  1848  1940  1941  1942  1943
               1994  1995  1996  1997  2063  2064  2065  2066  2151  2152  2153  2154  2168  2169  2170
               2171  2185  2186  2187  2188  2202  2203  2204  2205  2219  2220  2221  2222  2236  2237
               2238  2239  2253  2254  2255  2256  2350  2351  2352  2353  2849  2856  2859  2867  2870
               2911  2974  3017  3060  3061  3062  3063  3095  3096  3097  3098  3141  3142  3333  3334
               3335  3336  3460  3461  3462  3463  3586  3587  3588  3589  3741  3742  3743  3744  3908
               3909  3910  3911  4048  4049  4050  4051  4159  4269  4467  4485  4514  4516  4521  4539
               4557  4558  4559  4561  4586  4588  4590  4606  4609  4683  4762  4831  4840  4863  4893
               6402  6404  6420  6422  6424  6433  6435  6437
.IFNE          1334  1350  1432  1448  1530  1546  1628  1644  1721  1737  1819  1835  1917  1929
.IFT           4549  4592
.IFTF          4548  4590
.IIF             10    15    20    21   290   389   874   876   892   883   884   896   897  2853  2861
               2862  2873  2911  2916  2975  2977  2983  2984  2985  2997  2998  3018  3020  3026  3027
               3028  3040  3041  4160  4162  4168  4169  4170  4182  4183  4270  4272  4278  4279  4280
               4292  4293  4482  4507  4522  4523  4524  4525  4526  4554  4559  4567  4568  4569  4570
               4591  4603  4606  4607  4681  4856  4857  4858  4859  4860
.IRP            328   390   934   972   997  1020  1043  1093  1142  1212  1261  1359  1457  1555  1648
               1746  1844  1939  1993  2062  2150  2167  2184  2201  2218  2235  2252  2349  2859  3059
               3094  3140  3332  3459  3585  3740  3907  4047  4530  4775  4815  4869  4885
.LIST             2   138   159   273   290   328   366   368   369   370   371   372   373   374   375
                376   377   378   379   380   381   382   383   384   865   897   934   938   972   976
                997  1001  1020  1024  1043  1047  1093  1097  1142  1146  1212  1216  1261  1265  1359
               1363  1457  1461  1555  1559  1648  1652  1746  1750  1844  1848  1939  1943  1993  1997
               2062  2066  2150  2154  2167  2171  2184  2188  2201  2205  2218  2222  2235  2239  2252
               2256  2349  2353  2379  2389  2393  2861  2967  2998  3041  3059  3063  3094  3098  3140
               3142  3332  3336  3459  3463  3585  3589  3740  3744  3907  3911  4047  4051  4147  4183
               4248  4293  4441  4554  4570  4847  4856  4857  4858  4859  4660  4861  4914  6420  6422
               6424  6432  6434  6436
.MACRO          160   161   162   163   164   165   166   167   329   330   884  1261  2847  2985  3028
               4170  4280  4465  4847
.MCALL             4     5     6   273   897  2998  3041  4183  4293
.NLIST             1   138   159   273   290   328   366   368   369   370   371   372   373   374   375
```

DZCDBA.P11 CROSS REFERENCE TABLE

```
            376   377   378   379   380   381   382   383   384   865   897   934   938   972   976
            997  1001  1020  1024  1043  1047  1093  1097  1142  1146  1212  1216  1261  1265  1359
           1363  1457  1461  1555  1559  1648  1652  1746  1750  1844  1848  1939  1943  1993  1997
           2062  2066  2150  2154  2167  2171  2184  2188  2201  2205  2218  2222  2235  2239  2252
           2256  2349  2353  2379  2389  2393  2861  2967  2998  3041  3059  3063  3094  3098  3140
           3142  3332  3336  3459  3463  3585  3589  3740  3744  3907  3911  4047  4051  4147  4193
           4248  4293  4441  4554  4570  4847  4856  4857  4858  4859  4860  4861  4914  6420  6422
           6424  6432  6434  6436
.PAGE        42   330   389
.REPT       290   368   376  2380  2386
.SBTTL       43   138   169   284   294   299   332   412   865   934   972   997  1020  1043  1093
           1142  1212  1261  1359  1457  1555  1648  1746  1844  1939  1993  2062  2150  2167  2184
           2201  2218  2235  2252  2349  2393  2850  2967  3059  3094  3332  3459  3585  3740  3807
           4047  4147  4248  4441  4468  4517  4562  4610  4684  4763  4832  4848  4864  4914
.TITLE       10
.WORD       290   291   292   305   309   310   339   342   343   344   345   348   349   350   351
            352   353   354   355   356   357   366   368   369   370   371   372   373   374   375
            376   377   378   379   380   381   382   383  2866  2869  4493  4498  4675  4759  4894
           4896  4906
```

ERRORS DETECTED: 0

*DZCDBA,DZCDBA/CRF/SOL=DZCDBA
RUN-TIME: 21 19 3 SECONDS
CORE USED: 20K

JO1

Spooler runtime 31 Seconds, [illegible] disk reads, 3 disk writes, 215 pages