CD11/CD20

CARD READER DIAGNOSTIC
MD-11-DZCDB-B

EP-DZCDB-B-DL-B

FICHE 1 OF 2

OCT 1977
digital
MADE IN USA

CD11/CD20

CARD READER DIAGNOSTIC

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FICHE 2 OF 2

OCT 1977

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MADE IN USA

EOF1DXQABCSBQ411 00010000 770920 IDENTIFICATIBCP10 411 IZHDR1DZCDBBSEQ 00010000 770920 SEQ 0001

PRODUCT CODE: MAINDEC-11-DZCDB-B-D

PRODUCT NAME: CD11/CD20 CARD READER DIAGNOSTIC

DATE CREATED: JULY 1977

MAINTAINER: DIAGNOSTIC GROUP

AUTHOR: BRUCE BURGESS / ED RYAN

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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, M1200 OR AN RS1200 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, RS1200).

***** 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

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,
A SPECIAL MIS-REGISTERED CARD IS ALSO REQUIRED(FOR RS1200 ONLY)..

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-DZCDB  REV.B

        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.B

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

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

C. ERROR FUNCTIONS FOR CARD READER MODEL M1200 OR RS1200

   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"

   3. ANSWER THE QUESTION "M1200 OR RS1200" BY TYPING A Y FOR THE RS1200 OR AN N FOR THE M1200.

      NOTE: SINCE ONLY THE RS1200 HAS THE CAPABILITY TO DETECT A MIS-REGISTERED CARD, ONLY THIS MODEL SHOULD ENTER THE MISTERED CARD TEST.

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 ...)

SEQ 0008

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 OR RS1200

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 ᴾᴺᴰ 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/RS1200 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)

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.

ERROR FUNCTION TESTS FOR M1000/M200/M1200/RS1200

SEQ 0018

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/RS1200 ONLY)
READ CHECK ERROR

INSTRUCTIONS FOR MAKING A MIS-REGISTERED CARD

CUT A SMALL RECTANGULAR HOLE ABOUT THE SIZE OF A NORMAL PUNCHED HOLE IN A BLANK CARD. MAKE SURE THE LEADING EDGE OF THE HOLE FALLS IN A POSITION WHICH IS NORMALLY CONSIDERED TO BE OUT OF REGISTRATION. (BETWEEN MARKED COLUMNS)

6.4 READING A SINGLE DATA PATTERN

CHECKING OF CARDS WHICH HAVE ALL COLUMNS IDENTICALLY PUNCHED 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 HISTORY

8.0 FLOW CHARTS

9.0 PROGRAM LISTING

THIS IS A HISTORY OF THE DEVELOPMENT OF MAINDEC-11-DZCDB

PRODUCT CODE: MAINDEC-11-DZCDB-A
VERSION 000.001

PRODUCT NAME: CD11/CD20 CARD READER DIAGNOSTIC

ORIGINAL RELEASE: MARCH 21 1976

ORIGINAL AUTHOR: BRUCE BURGESS

****

PRODUCT CODE: MAINDEC-11-DZCDB-B
VERSION 000.002

PRODUCT NAME: CD11/CD20 CARD READER DIAGNOSTIC

DATE RELEASED: MAY 1977

UPDATE AUTHOR: GREG GLEZMAN

UPDATES:

1. ADDED TEST FOR MONITOR PRESENCE.

2. ADDED A HALT TO ALLOW THE OPERATOR TO SET THE SR SWITCHES IN THE CASE OF NO MONITOR.

3. FIXED THE (LOW BYTE) LOAD TESTS FOR THE CDC AND CDA REGISTERS SO THEY FUNCTION WITHOUT ERROR.

4. ADDED A TSET FOR THE RS1200 CARD READER TO TEST FOR A MIS-REGISTERED CARD.

5. ADDED A QUESTION FOR THE OPERATOR TO INFORM THE PROGRAM IF IT IS TESTING AN RS1200 CARD READER.

6. CHANGE THE MESSAGE TO THE OPERATOR PERTAINING TO THE STACK CHECK ERROR TEST. THE CHANGE MAKES THE PROCEDURE

FLOW CHART
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CD11/CD20 CARD READER DIAGNOSTIC

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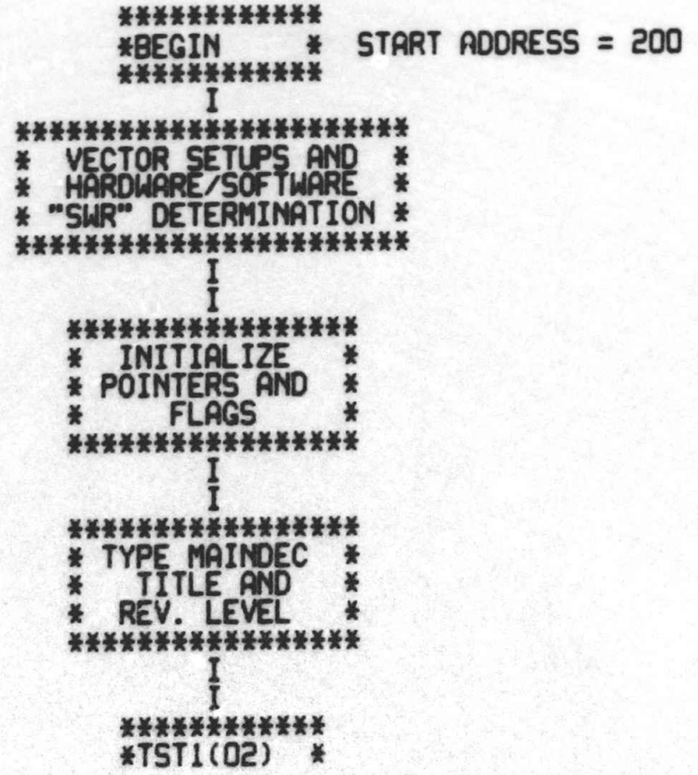
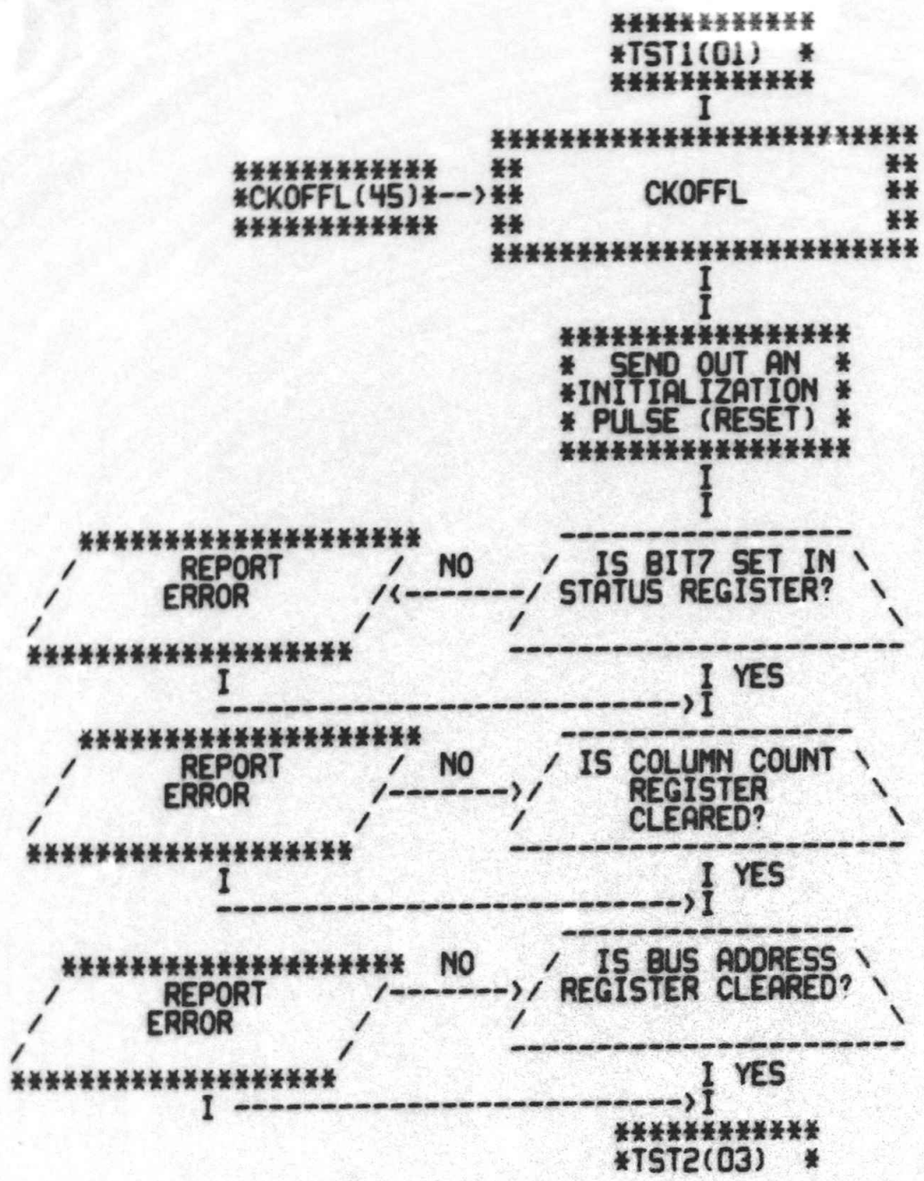
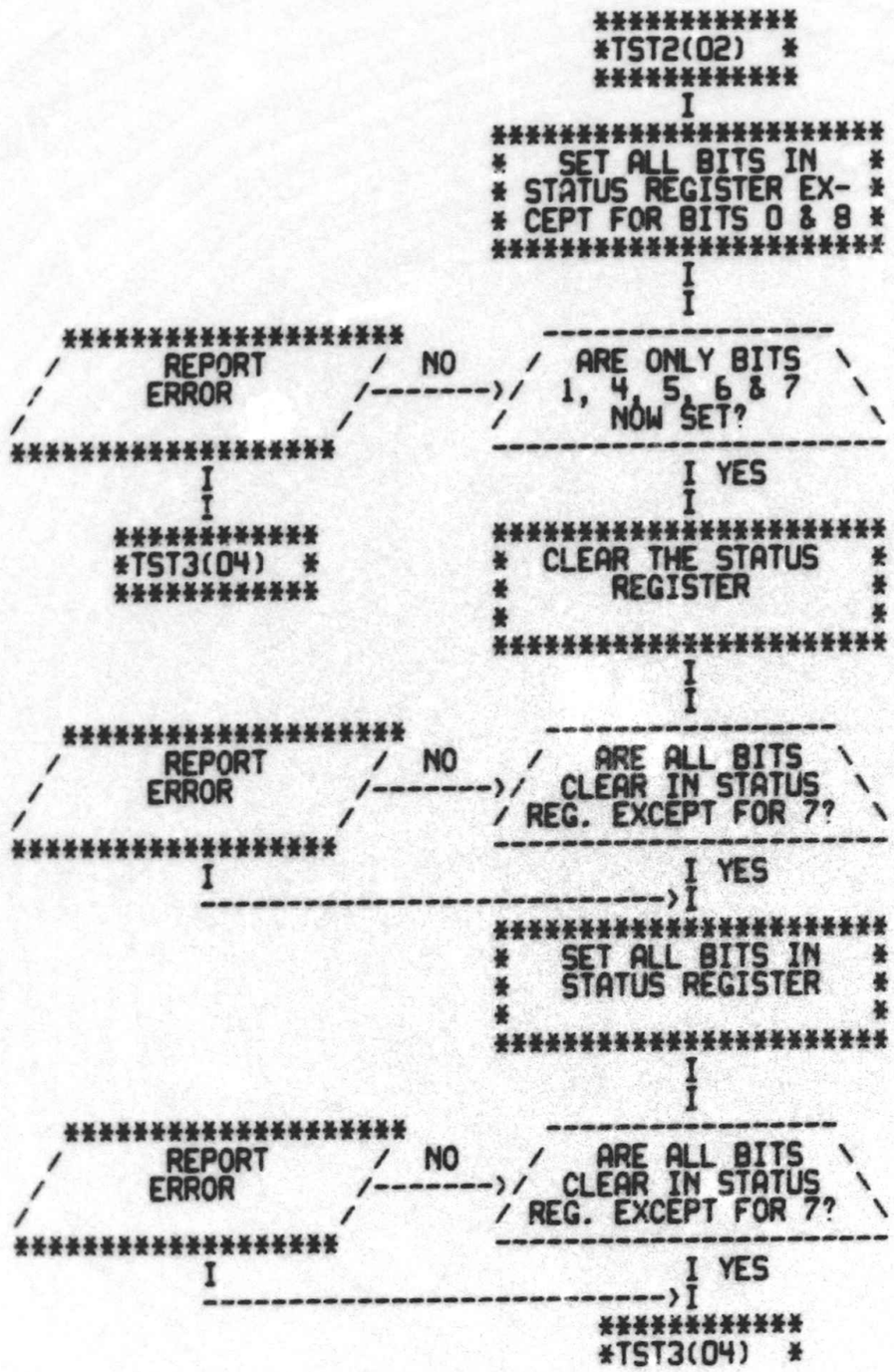
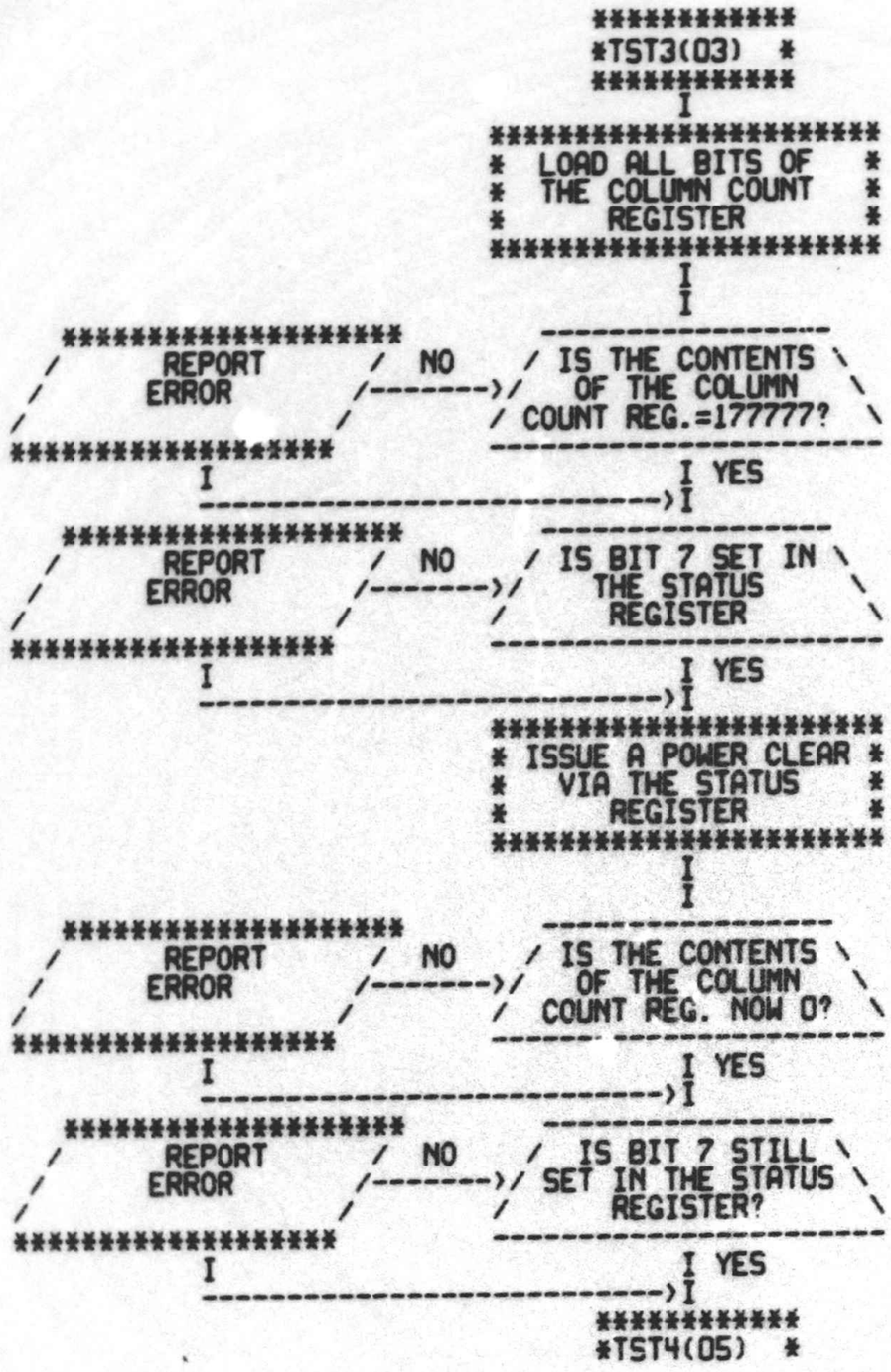
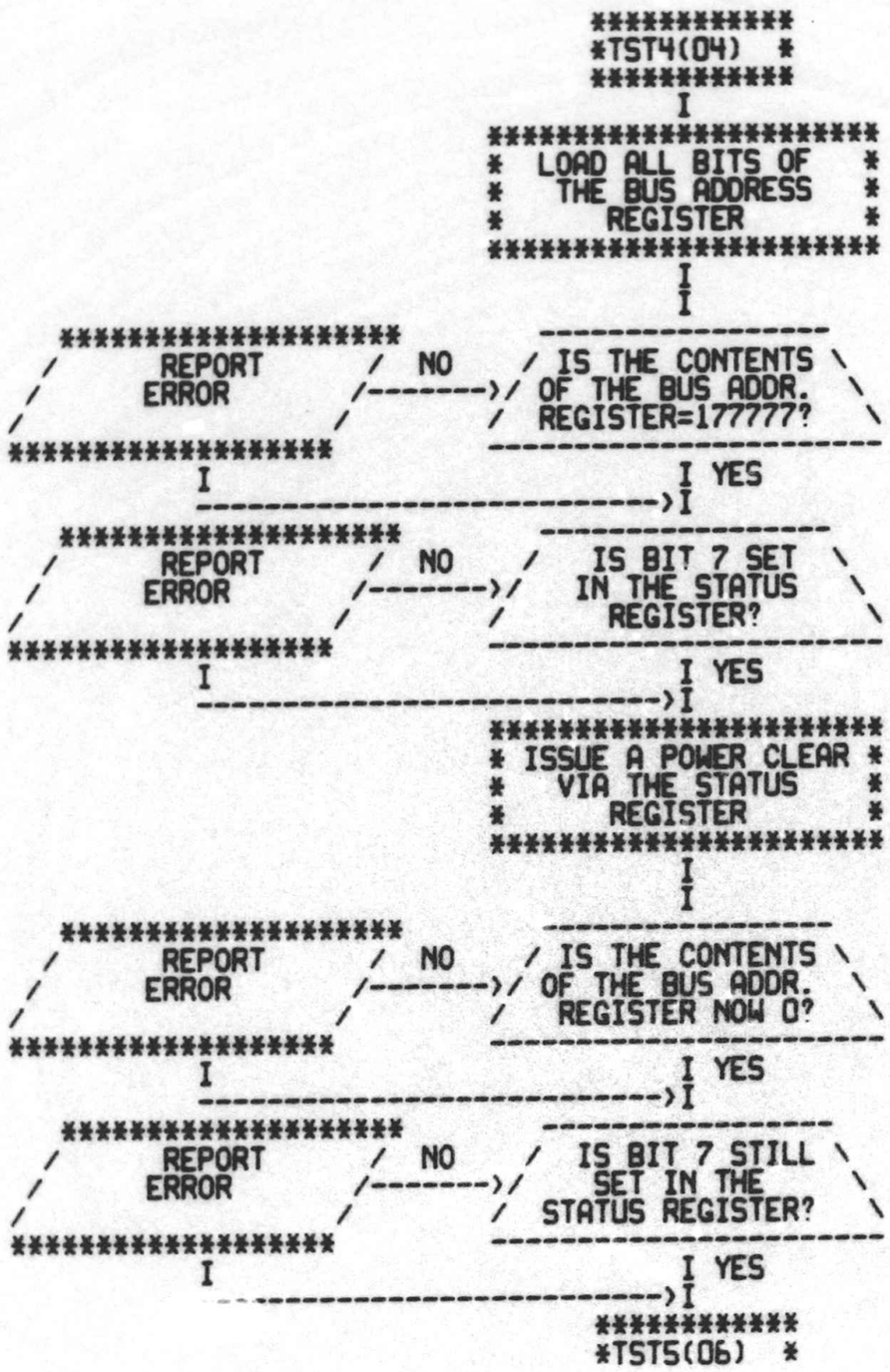
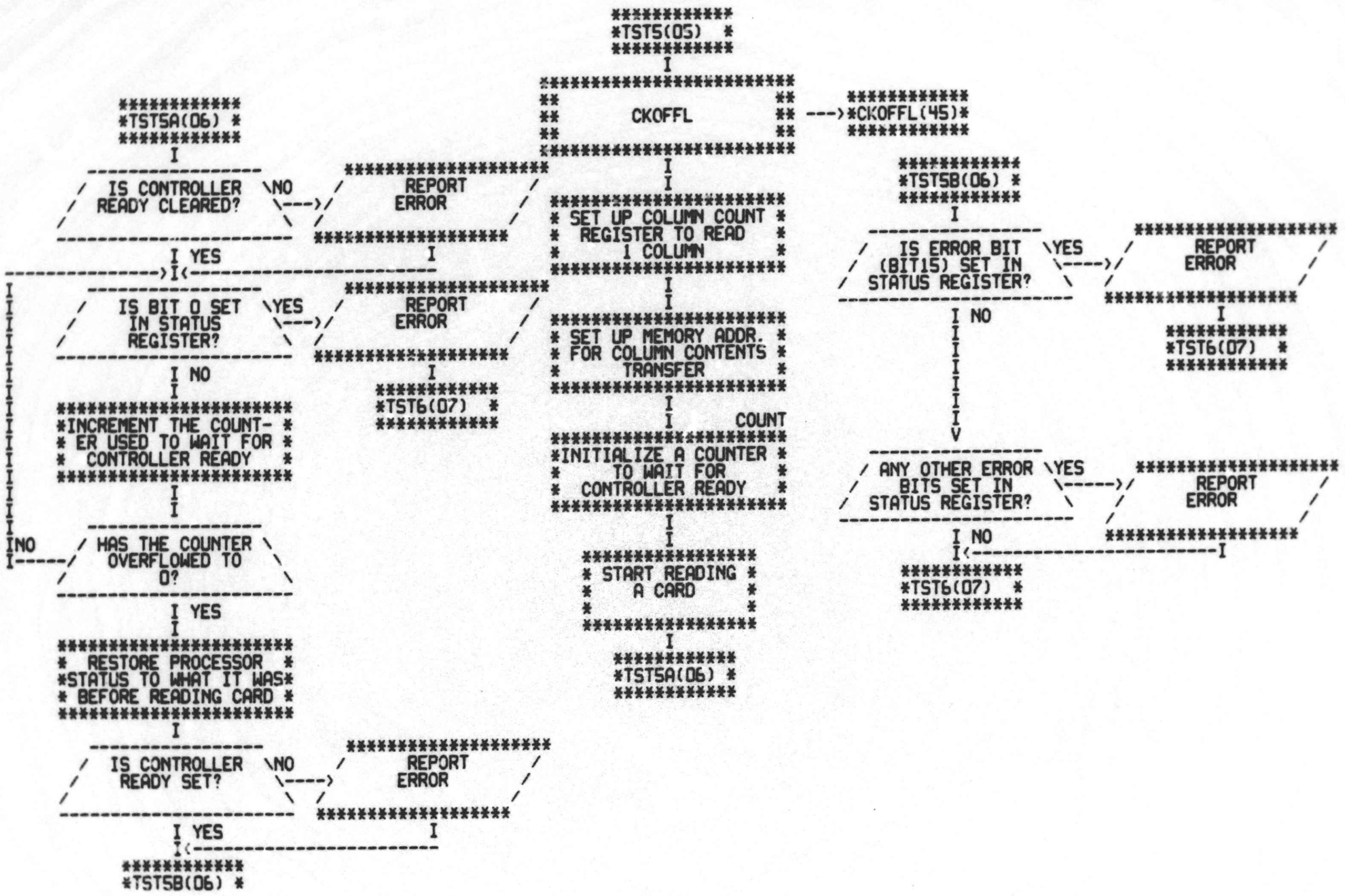

BEGIN
START ADDRESS = 200
VECTOR SETUPS AND HARDWARE/SOFTWARE "SWR" DETERMINATION
INITIALIZE POINTERS AND FLAGS
TYPE MAINDEC TITLE AND REV. LEVEL
TST1(02)


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

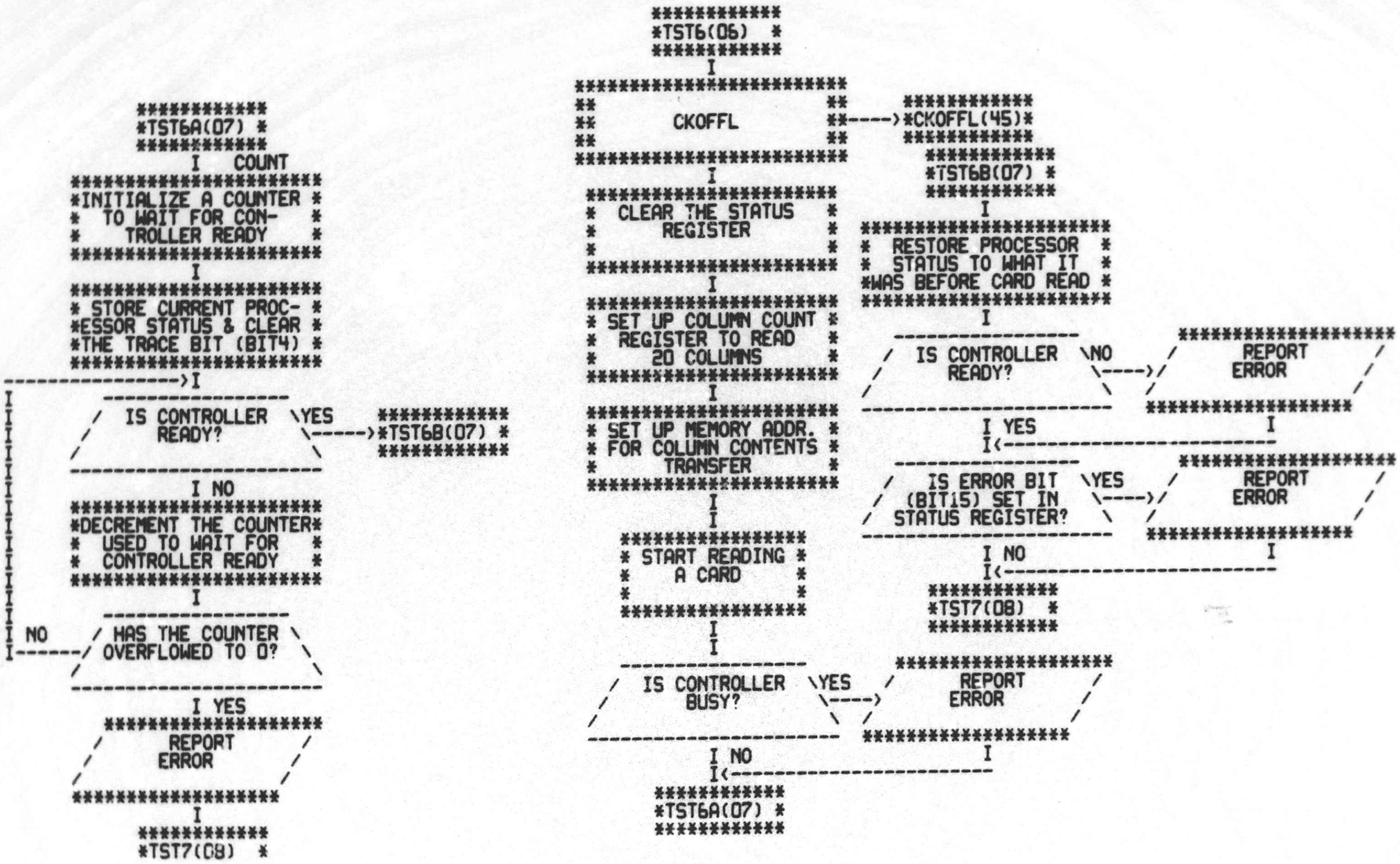

TST2(02)
SET ALL BITS IN STATUS REGISTER EXCEPT FOR BITS 0 & 8
ARE ONLY BITS 1, 4, 5, 6 & 7 NOW SET?
NO
REPORT ERROR
YES
CLEAR THE STATUS REGISTER
ARE ALL BITS CLEAR IN STATUS REG. EXCEPT FOR 7?
NO
REPORT ERROR
YES
SET ALL BITS IN STATUS REGISTER
ARE ALL BITS CLEAR IN STATUS REG. EXCEPT FOR 7?
NO
REPORT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

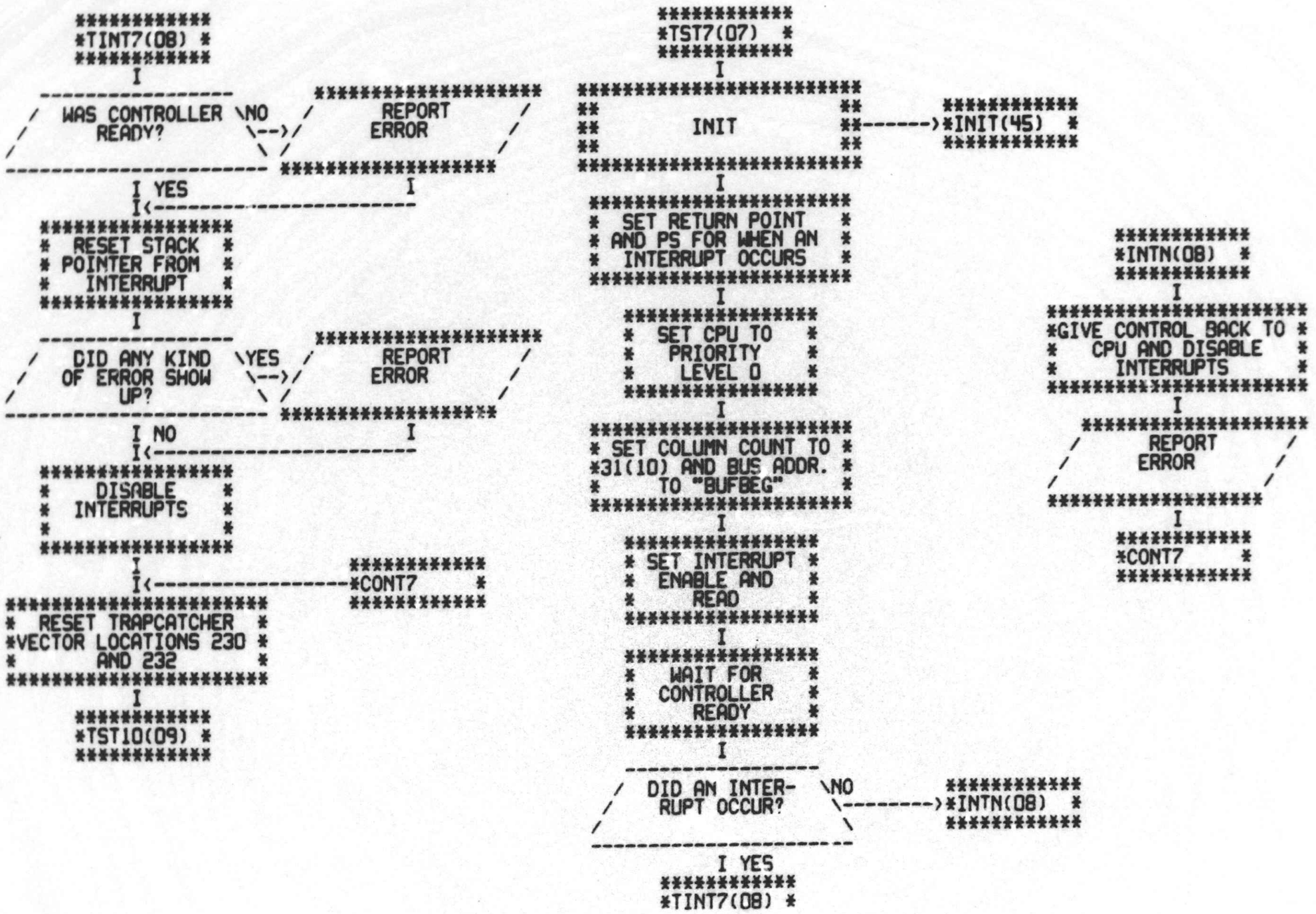

*TST3(03)
LOAD ALL BITS OF THE COLUMN COUNT REGISTER
REPORT ERROR
NO
IS THE CONTENTS OF THE COLUMN COUNT REG.=177777?
YES
REPORT ERROR
NO
IS BIT 7 SET IN THE STATUS REGISTER
YES
ISSUE A POWER CLEAR VIA THE STATUS REGISTER
REPORT ERROR
NO
IS THE CONTENTS OF THE COLUMN COUNT REG. NOW 0?
YES
REPORT ERROR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

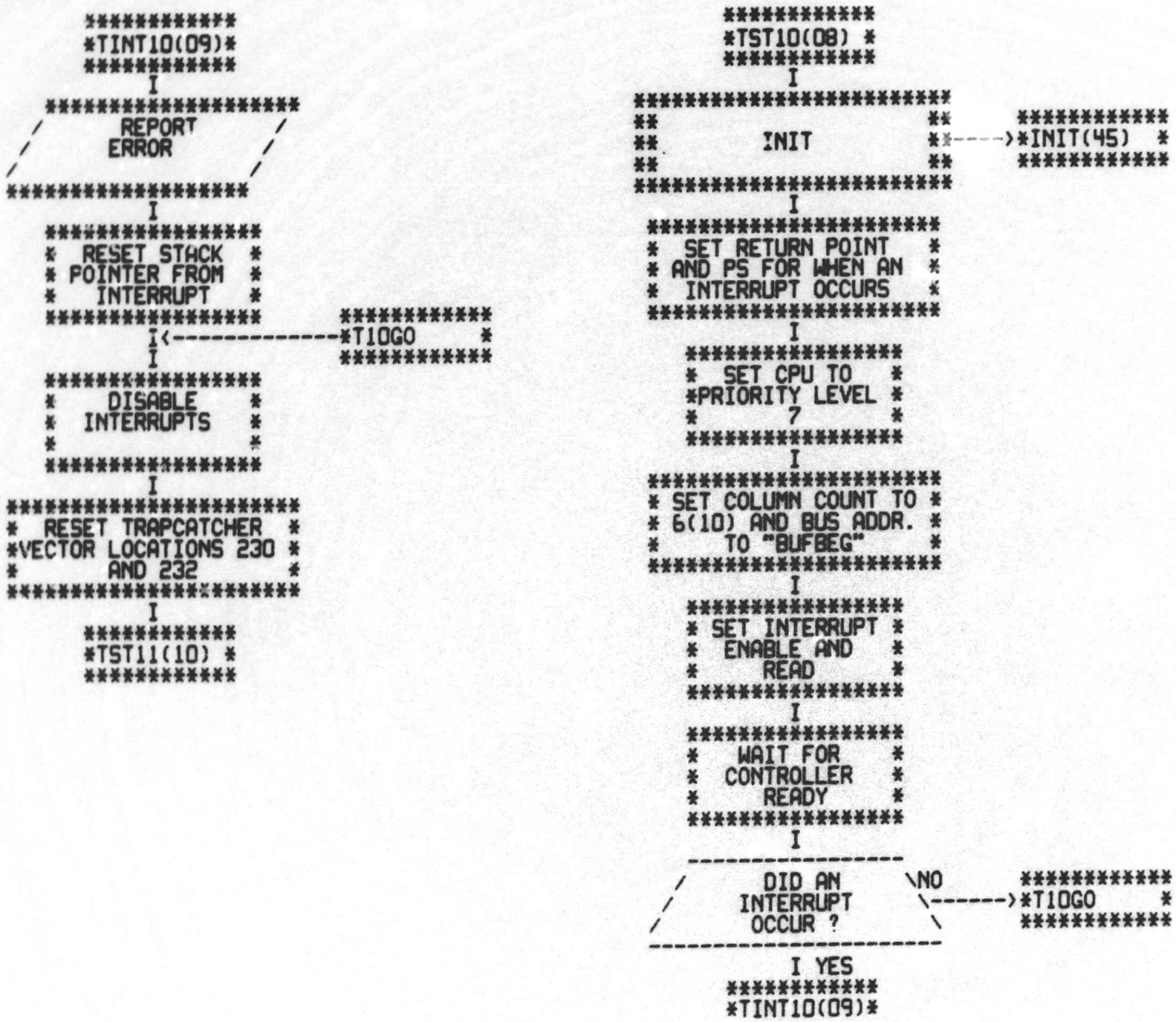

TST4(04)
LOAD ALL BITS OF THE BUS ADDRESS REGISTER
IS THE CONTENTS OF THE BUS ADDR. REGISTER=177777?
NO
REPORT ERROR
YES
IS BIT 7 SET IN THE STATUS REGISTER?
NO
REPORT ERROR
YES
ISSUE A POWER CLEAR VIA THE STATUS REGISTER
IS THE CONTENTS OF THE BUS ADDR. REGISTER NOW 0?
NO
REPORT ERROR
YES
IS BIT 7 STILL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

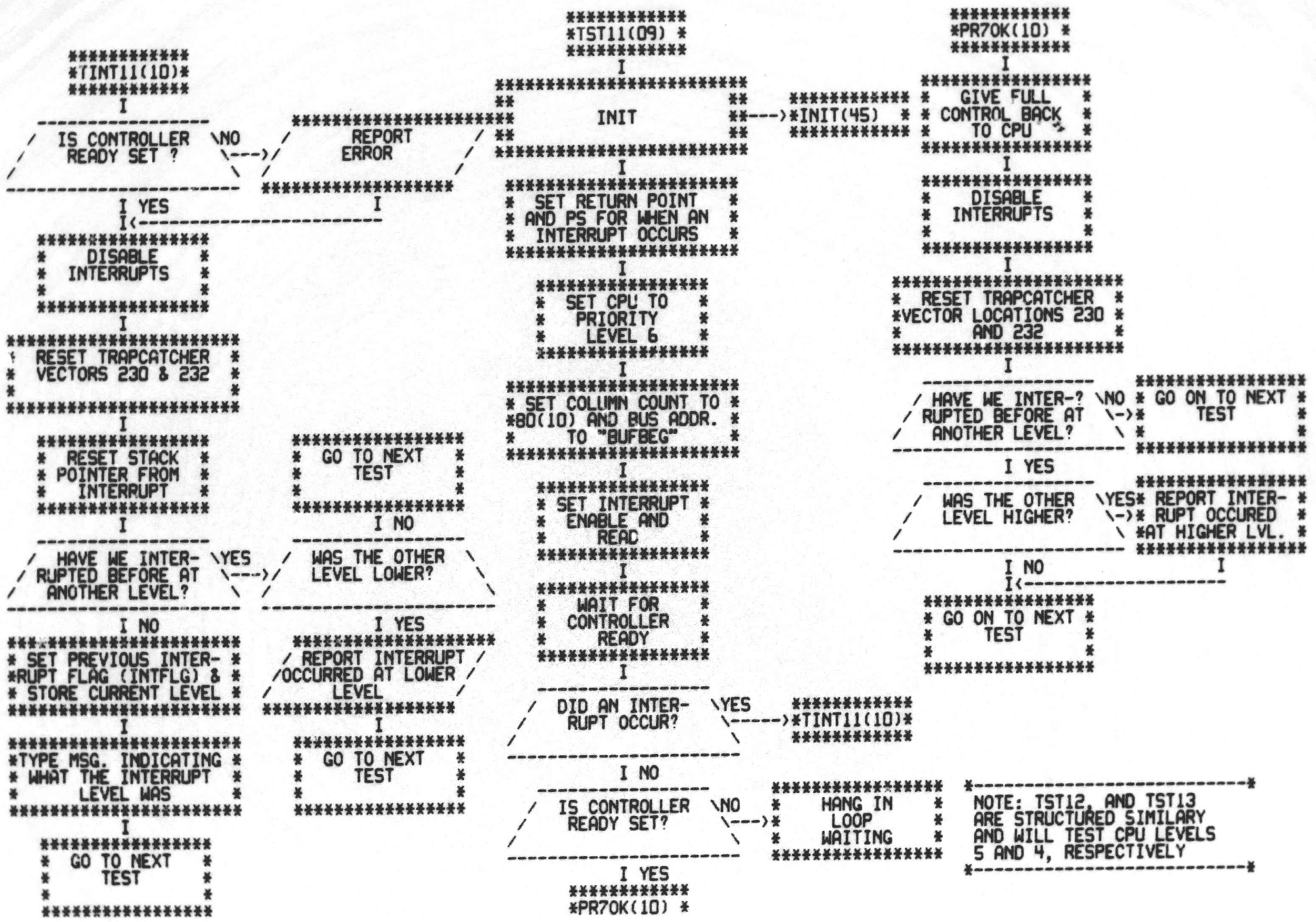

*TST5A(06) *
IS CONTROLLER READY CLEARED?
NO
REPORT ERROR
I YES
IS BIT 0 SET IN STATUS REGISTER?
YES
REPORT ERROR
*TST6(07) *
I NO
*INCREMENT THE COUNT- ER USED TO WAIT FOR CONTROLLER READY *
HAS THE COUNTER OVERFLOWED TO 0?
NO
I YES
* RESTORE PROCESSOR STATUS TO WHAT IT WAS BEFORE READING CARD *
IS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

CD11/CD20 CARD READER DIAGNOSTIC
TEST BIT 2 TO BE CLEAR AFTER CARD READ




*TINT7(08) *
WAS CONTROLLER READY?
NO
REPORT ERROR
YES
* RESET STACK * POINTER FROM * INTERRUPT *
DID ANY KIND OF ERROR SHOW UP?
YES
REPORT ERROR
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 INTER- RUPT OCCUR?
NO
*INTN(08) *
YES
*TINT7(08) *
*INTN(08) *
*GIVE CONTROL BACK TO * * CPU AND DISABLE * * INTERRUPTS *
REPORT ERROR
*CONT7 *

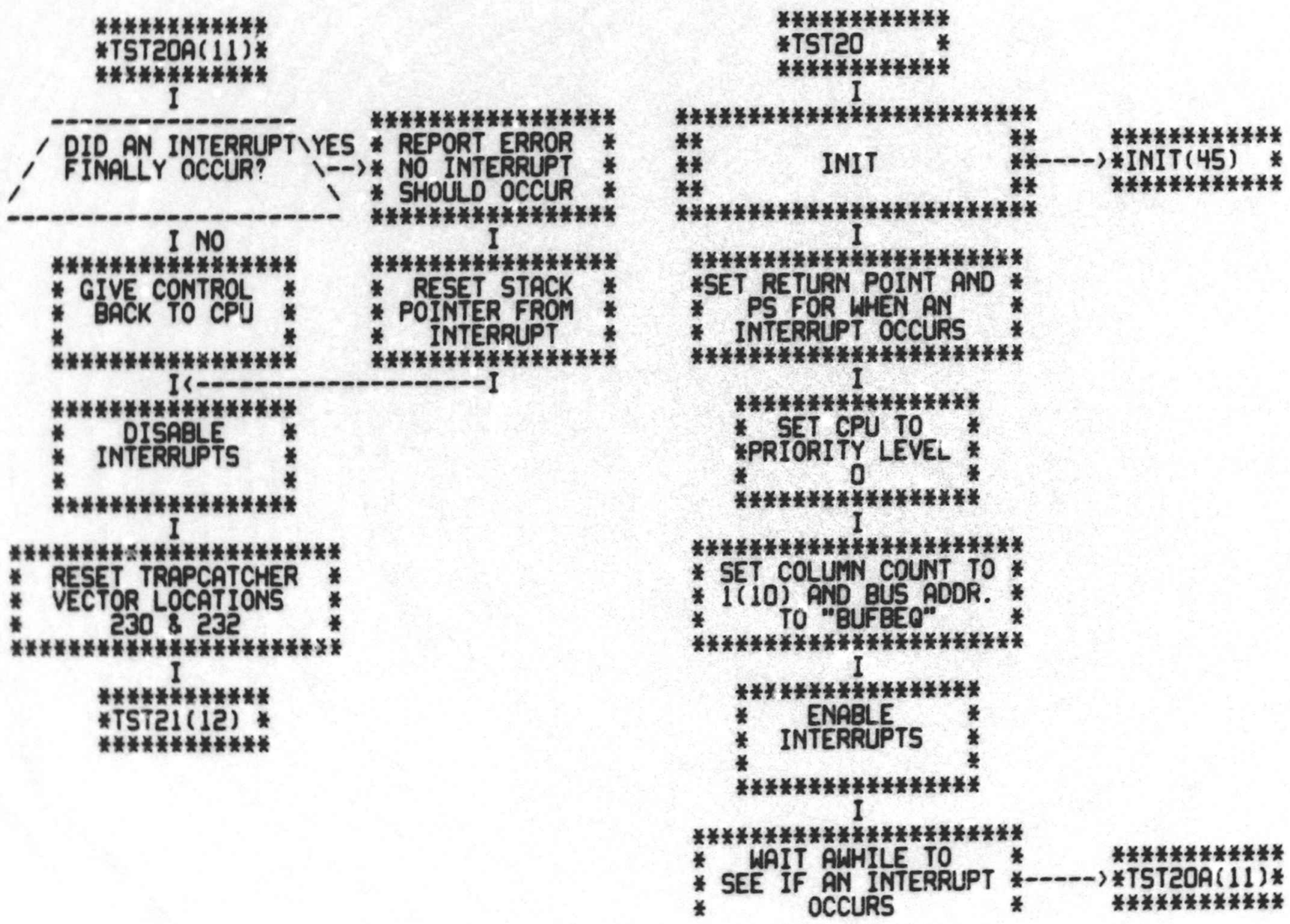

TINT10(09)
REPORT ERROR
RESET STACK POINTER FROM INTERRUPT
*T10GO
DISABLE INTERRUPTS
RESET TRAPCATCHER VECTOR LOCATIONS 230 AND 232
*TST11(10)
*TST10(08)
INIT
*INIT(45)
SET RETURN POINT AND PS FOR WHEN AN INTERRUPT OCCURS
SET CPU TO *PRIORITY LEVEL 7
SET COLUMN COUNT TO 6(10) AND BUS ADDR. TO "BUFBEG"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

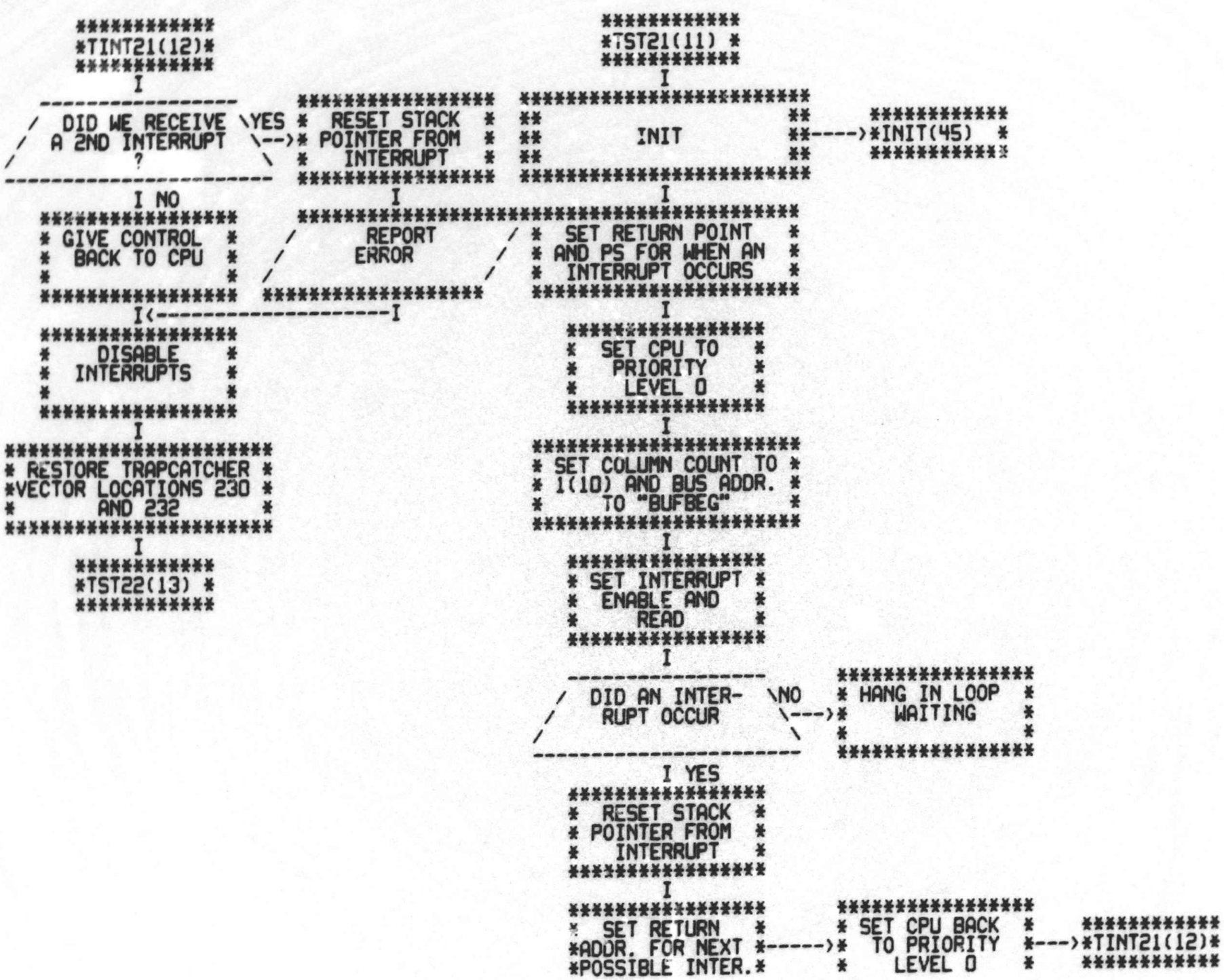

TINT11(10)
IS CONTROLLER READY SET ?
NO
REPORT ERROR
YES
DISABLE INTERRUPTS
RESET TRAPCATCHER VECTORS 230 & 232
RESET STACK POINTER FROM INTERRUPT
HAVE WE INTER-RUPTED BEFORE AT ANOTHER LEVEL?
YES
GO TO NEXT TEST
NO
SET PREVIOUS INTER-*RUPT FLAG (INTFLG) & STORE CURRENT LEVEL
*TYPE MSG. INDICATING WHAT THE INTERRUPT LEVEL WAS
GO TO NEXT TEST
WAS THE OTHER LEVEL LOWER?
YES
REPORT INTERRUPT OCCURRED AT LOWER LEVEL
GO TO NEXT TEST
*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?
YES
TINT11(10)
NO
IS CONTROLLER READY SET?
NO
HANG IN LOOP WAITING
YES
*PR70K(10) *
*PR70K(10) *
GIVE FULL CONTROL BACK TO CPU
*INIT(45) *
DISABLE INTERRUPTS
RESET TRAPCATCHER *VECTOR LOCATIONS 230 AND 232
HAVE WE INTER-RUPTED BEFORE AT ANOTHER LEVEL?
NO
GO ON TO NEXT TEST
YES
WAS THE OTHER LEVEL HIGHER?
YES
REPORT INTER-RUPT OCCURED *AT HIGHER LVL.
NO
GO ON TO NEXT TEST
NOTE: TST12, AND TST13 ARE STRUCTURED SIMILARY AND WILL TEST CPU LEVELS 5 AND 4, RESPECTIVELY

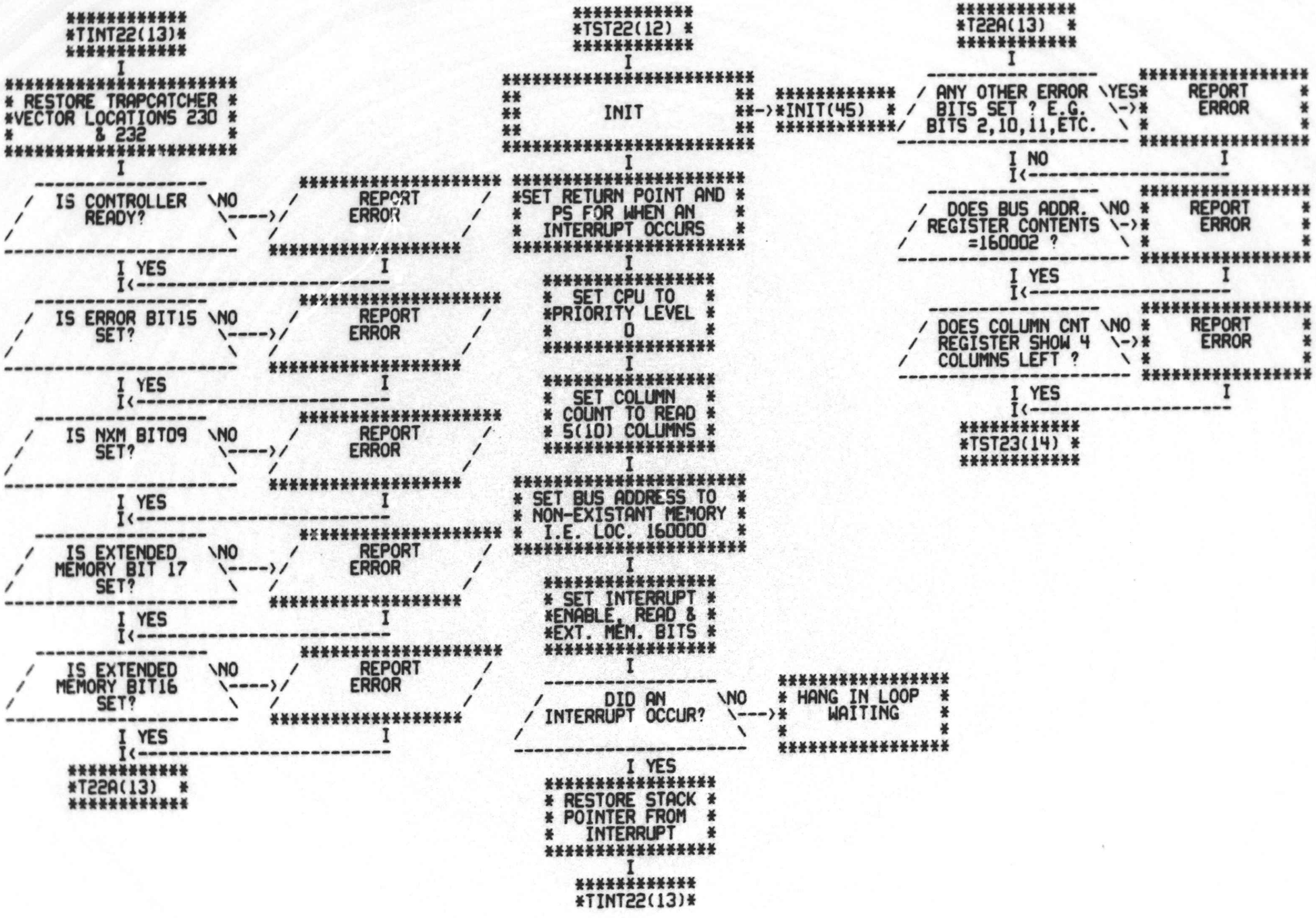
TEST 14 THRU 17 ARE STRUCTURED SIMILARLY

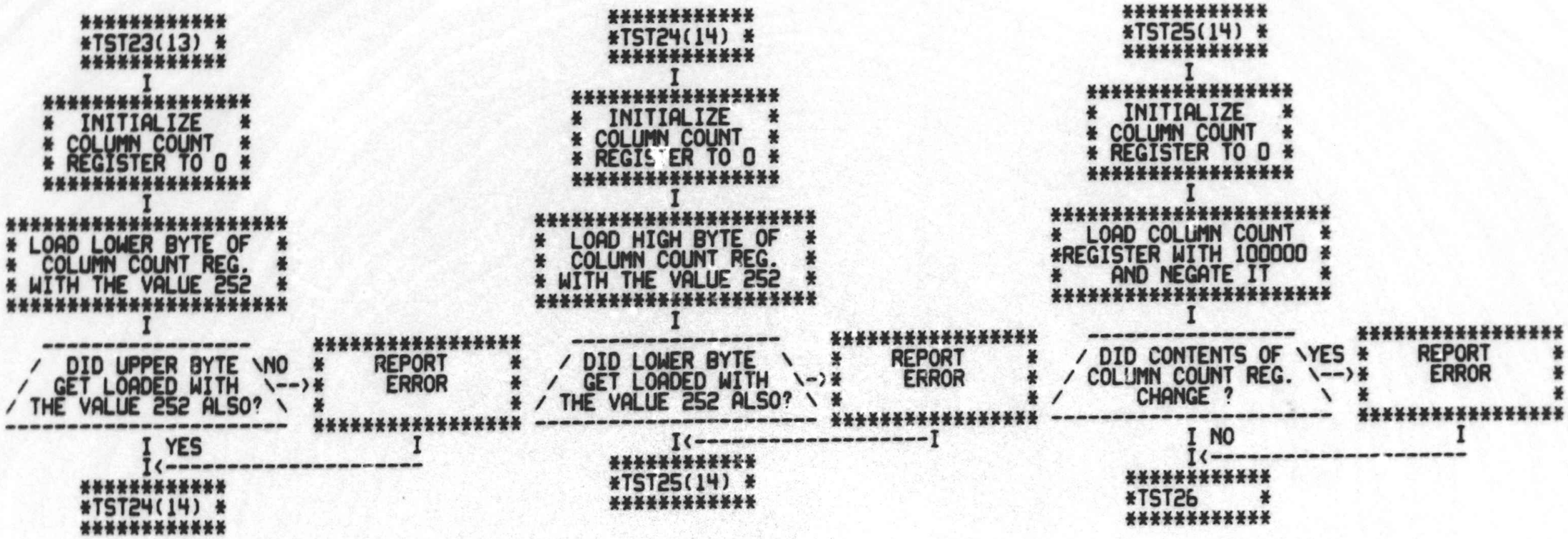
TO THAT SHOWN FOR TEST 11 *TST11(10)*

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.

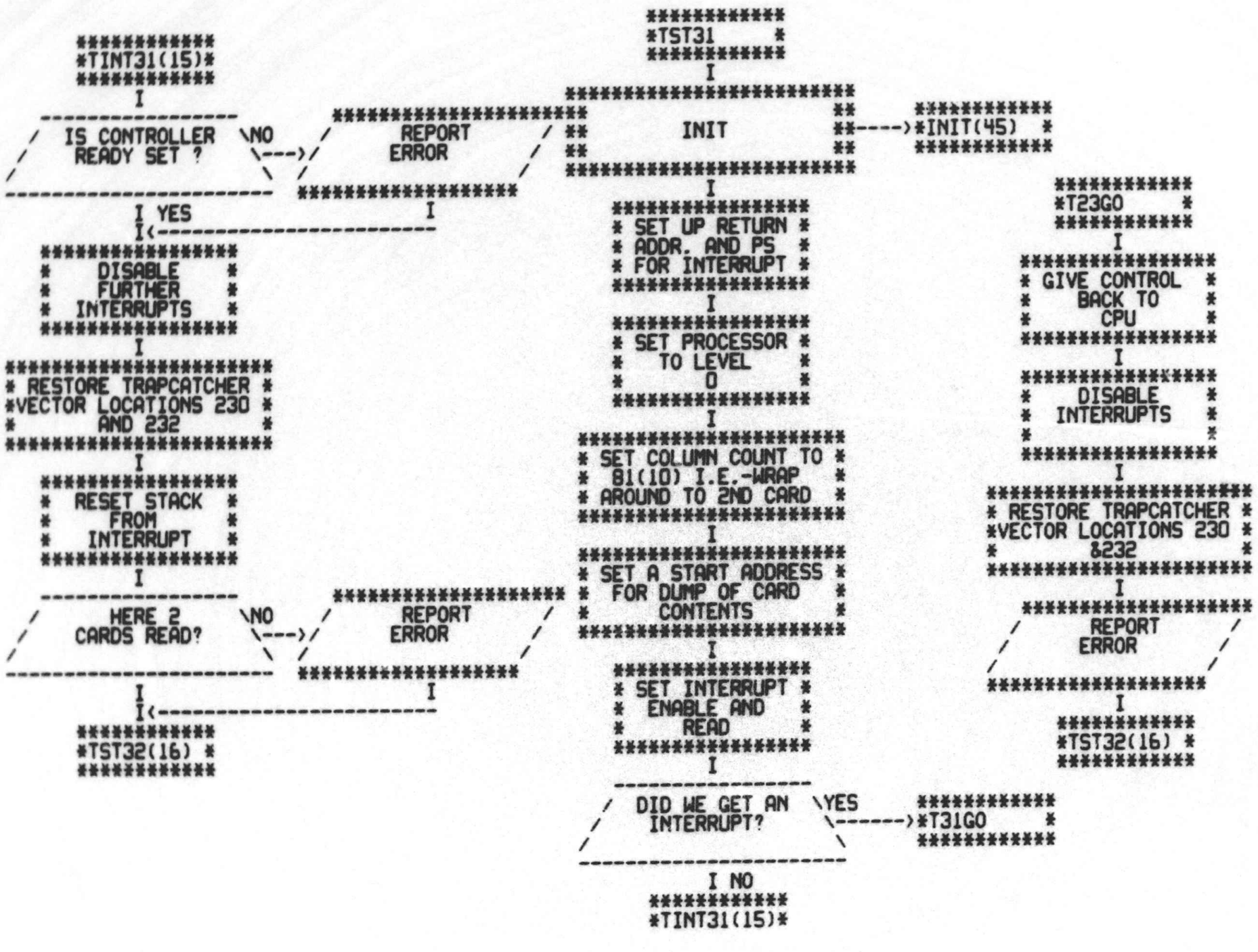


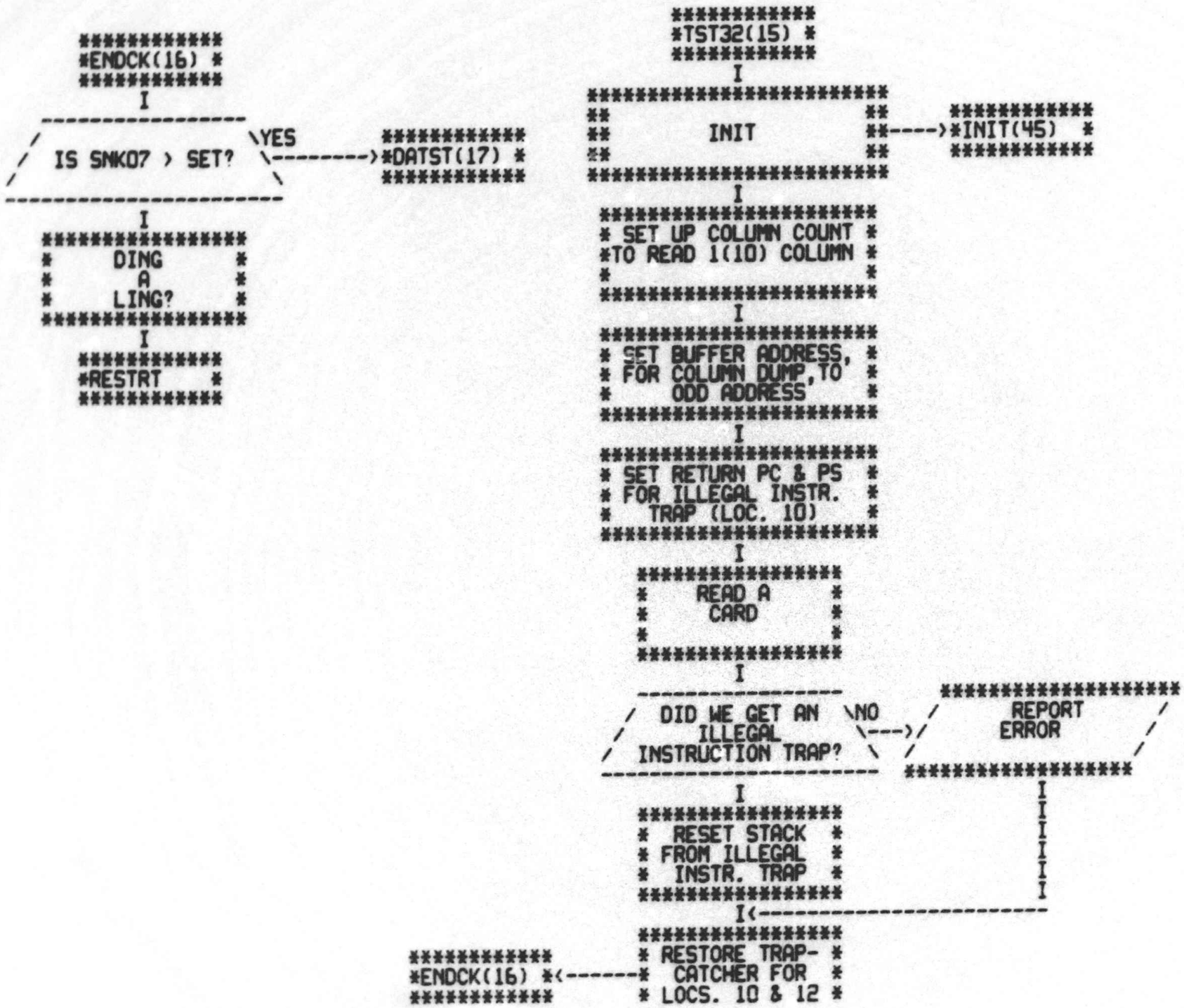

TINT21(12)
DID WE RECEIVE A 2ND INTERRUPT ?
YES
RESET STACK POINTER FROM INTERRUPT
I NO
GIVE CONTROL BACK TO CPU
REPORT ERROR
DISABLE INTERRUPTS
RESTORE TRAPCATCHER *VECTOR LOCATIONS 230 AND 232
*TST22(13) *
*TST21(11) *
INIT
*INIT(45) *
SET RETURN POINT AND PS FOR WHEN AN INTERRUPT OCCURS
SET CPU TO PRIORITY LEVEL 0
SET COLUMN COUNT TO 1(10) AND BUS ADDR. TO "BUFBEG"
SET INTERRUPT ENABLE AND READ
DID AN INTER-RUPT 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)

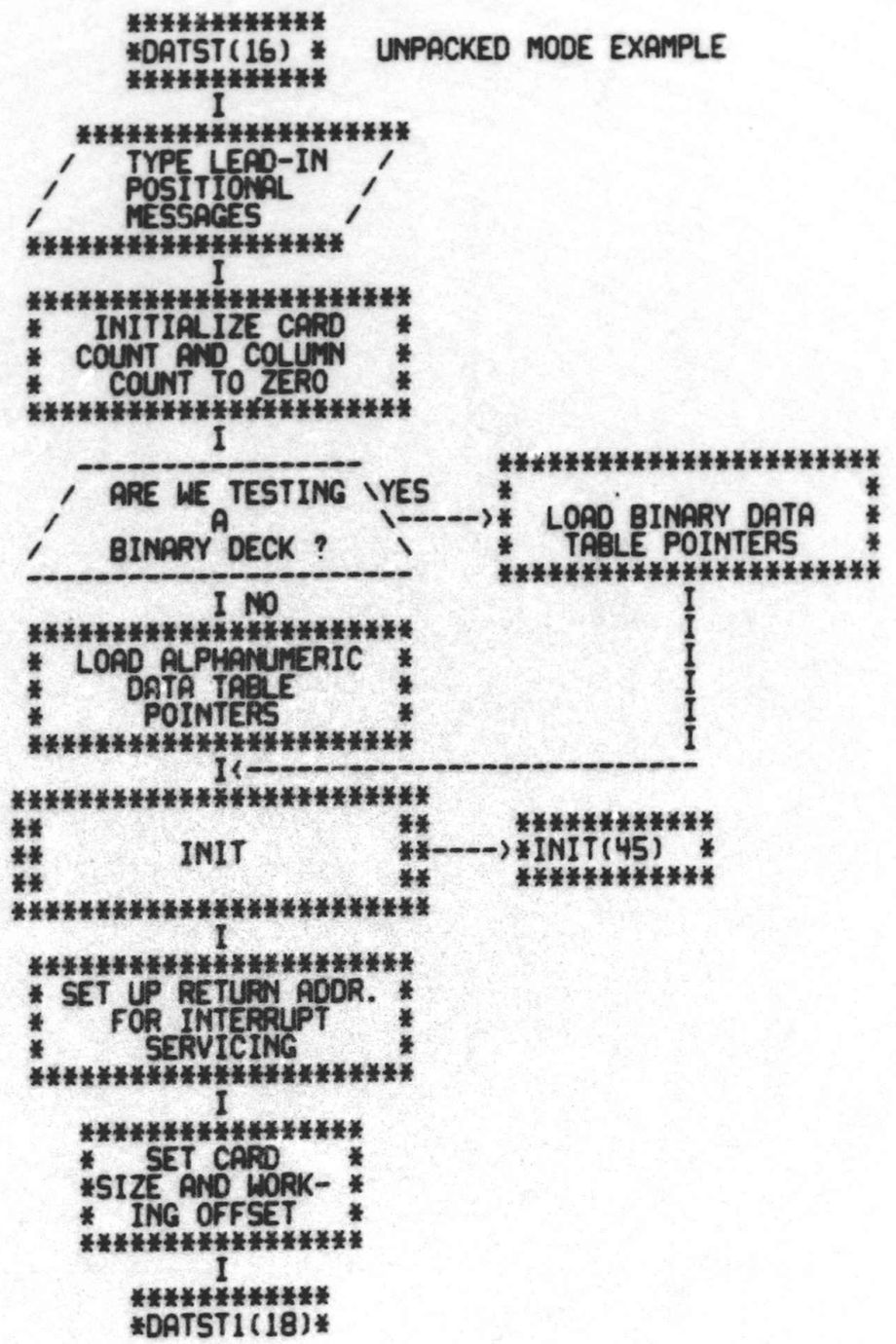

TINT22(13)
* RESTORE TRAPCATCHER *
*VECTOR LOCATIONS 230 *
* & 232 *
IS CONTROLLER READY?
NO
REPORT ERROR
YES
IS ERROR BIT15 SET?
NO
REPORT ERROR
YES
IS NXM BIT09 SET?
NO
REPORT ERROR
YES
IS EXTENDED MEMORY BIT 17 SET?
NO
REPORT ERROR
YES
IS EXTENDED MEMORY BIT16 SET?
NO
REPORT ERROR
YES
*T22A(13) *
*TST22(12) *
INIT
*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)
*INIT(45) *
*T22A(13) *
ANY OTHER ERROR BITS SET ? E.G. BITS 2,10,11,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) *

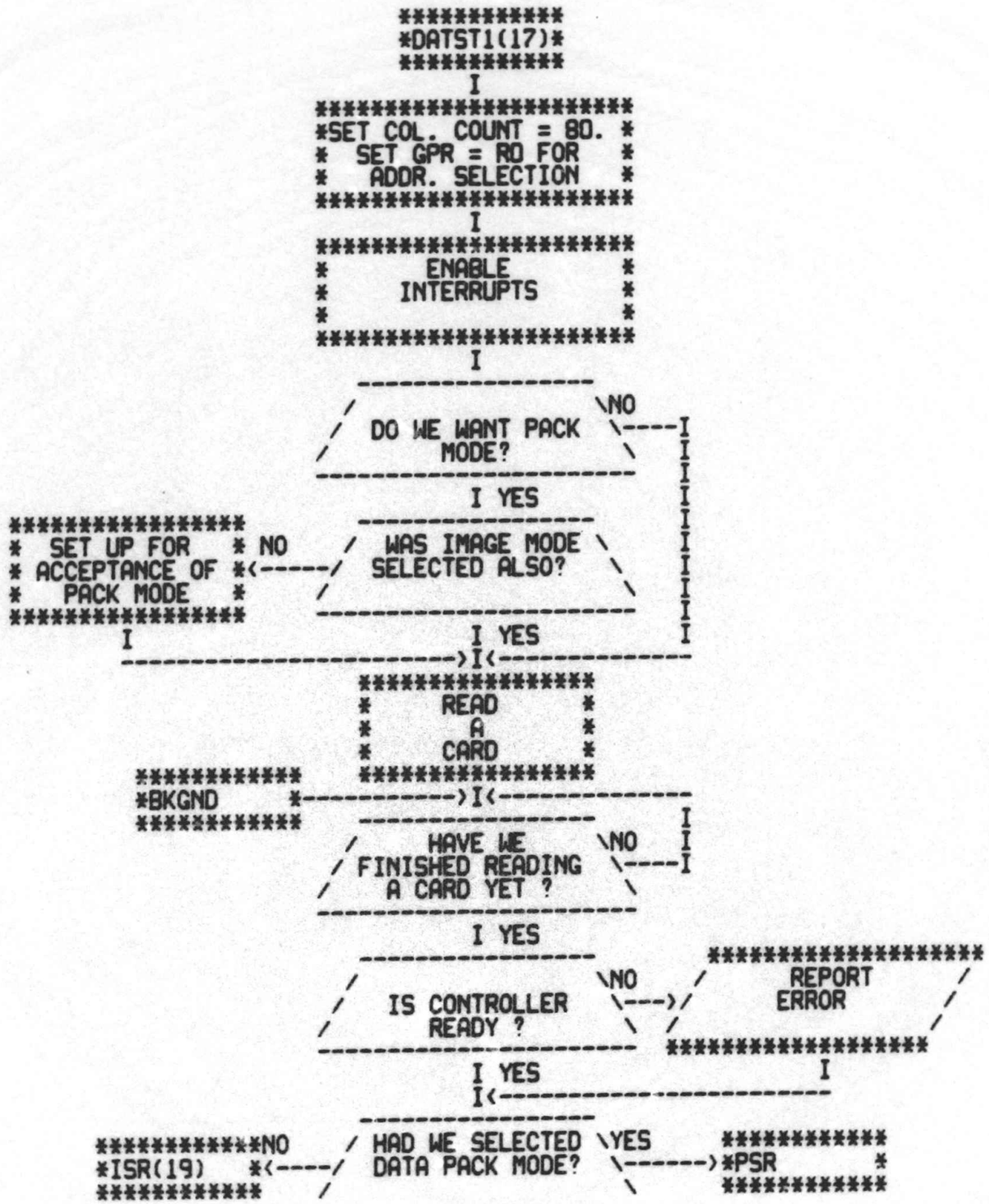


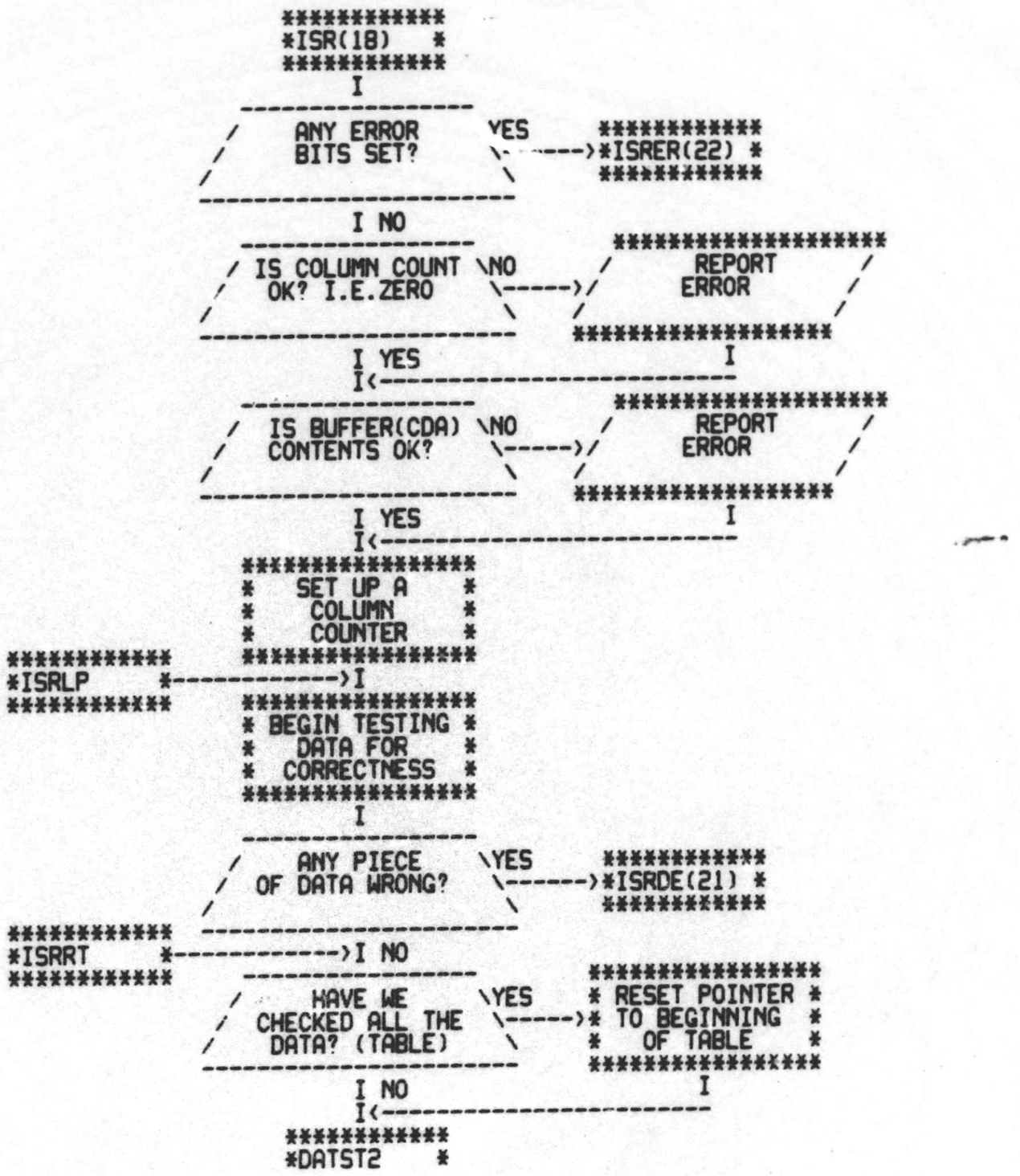
NOTE: TESTS 26, 27 AND 30 ARE CARBON COPIES OF TESTS 23, 24, AND 25, RESPECTIVELY. ONLY DIFFERENCE BEING THAT TESTS 23 - 25 OPERATE ON COLUMN COUNT REGISTER, AND TESTS 26 - 30 OPERATE ON BUS ADDRESS REGISTER.

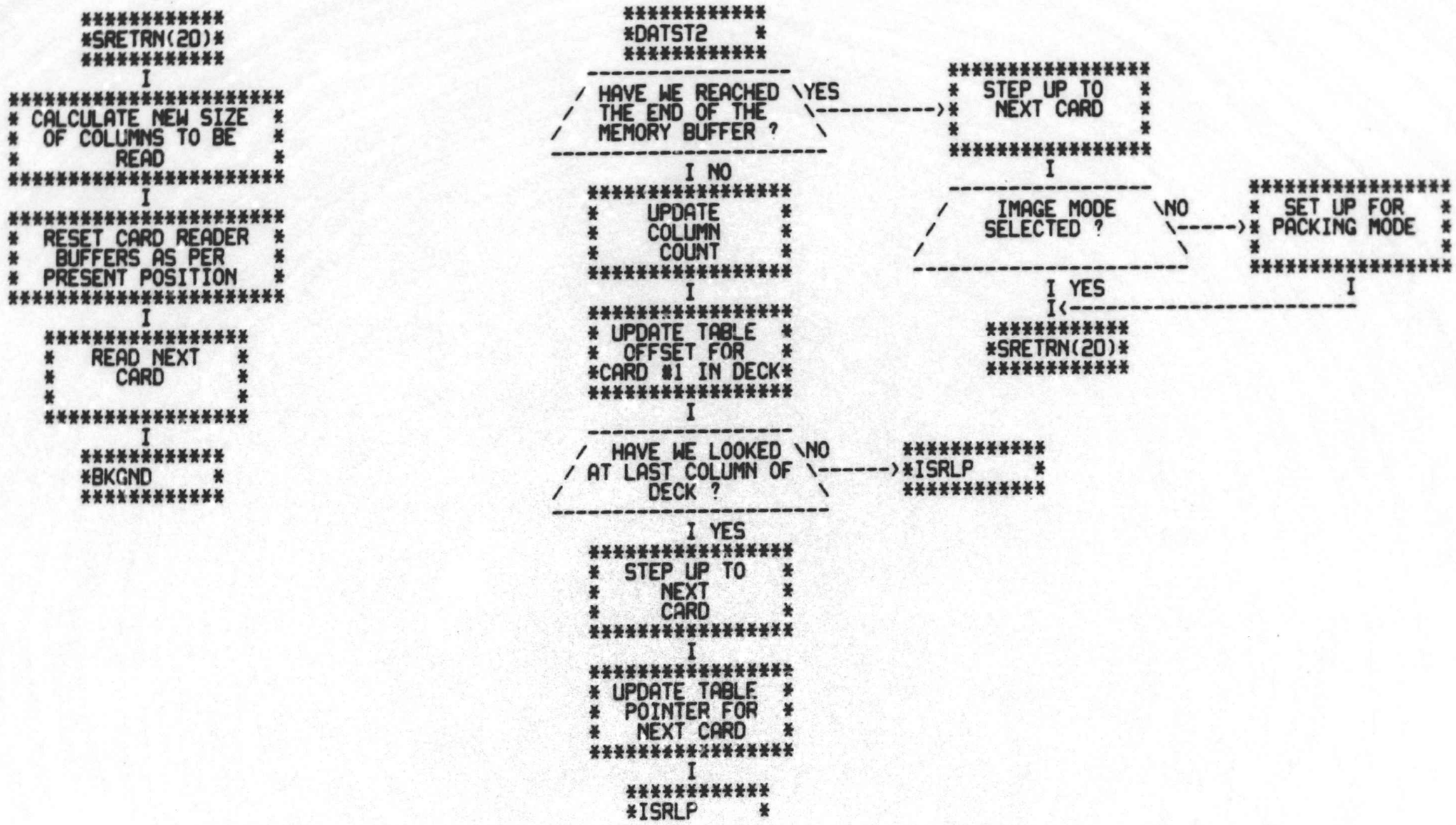

TINT31(15)
IS CONTROLLER READY SET ?
NO
REPORT ERROR
YES
DISABLE FURTHER INTERRUPTS
RESTORE TRAPCATCHER *VECTOR LOCATIONS 230 AND 232
RESET STACK FROM INTERRUPT
HERE 2 CARDS READ?
NO
REPORT ERROR
*TST32(16) *
*TST31 *
INIT
*INIT(45) *
SET UP RETURN ADDR. AND PS FOR INTERRUPT
SET PROCESSOR TO LEVEL 0
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) *

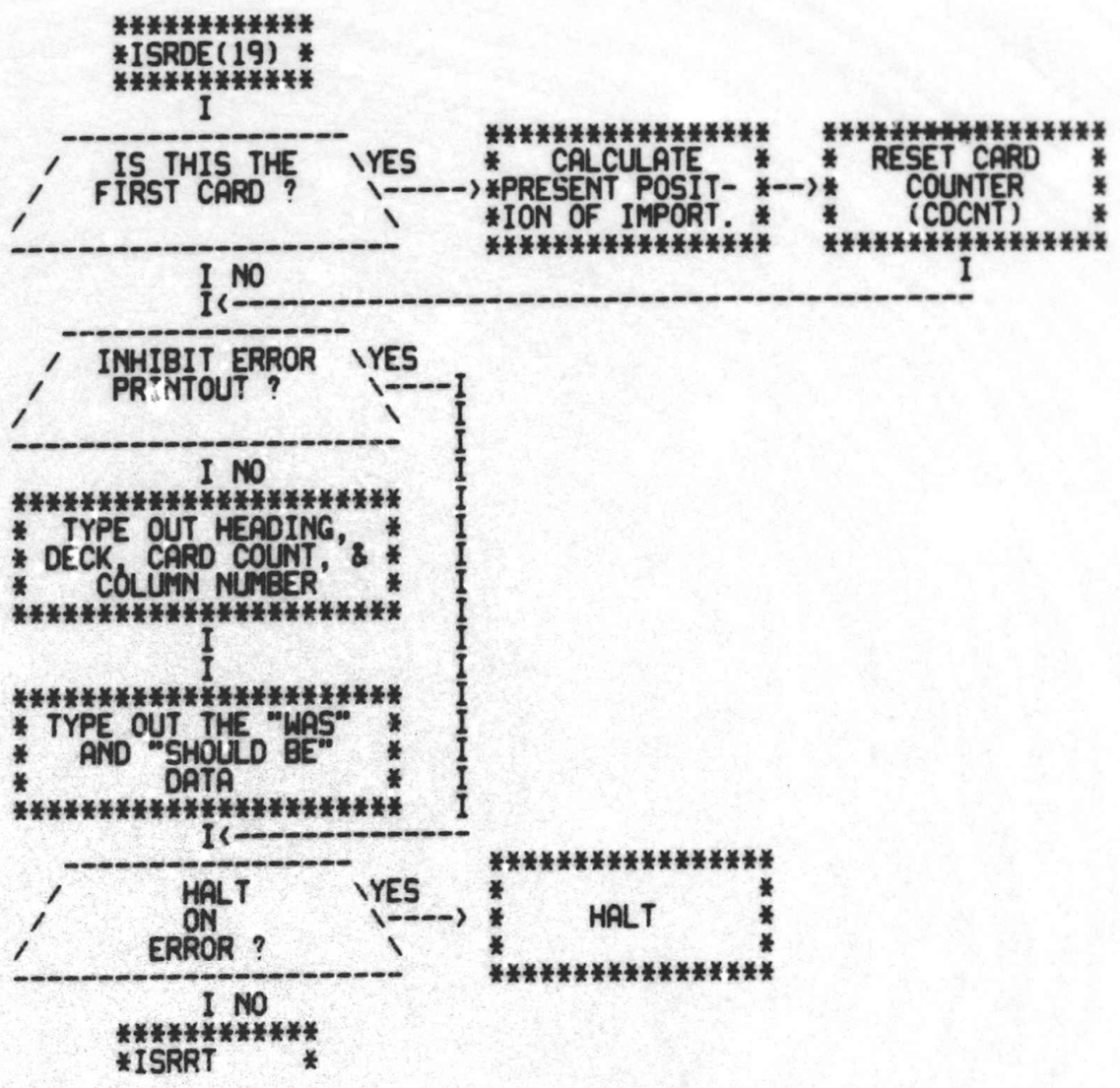

*ENDCK(16) *
IS SNK07 > SET?
YES
*DATST(17) *
DING A LING?
*RESTRT *
*TST32(15) *
INIT
*INIT(45) *
SET UP COLUMN COUNT TO READ 1(10) COLUMN
SET BUFFER ADDRESS, FOR COLUMN DUMP,TO ODD ADDRESS
SET RETURN PC & PS FOR ILLEGAL INSTR. TRAP (LOC. 10)
READ A CARD
DID WE GET AN ILLEGAL INSTRUCTION TRAP?
NO
REPORT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

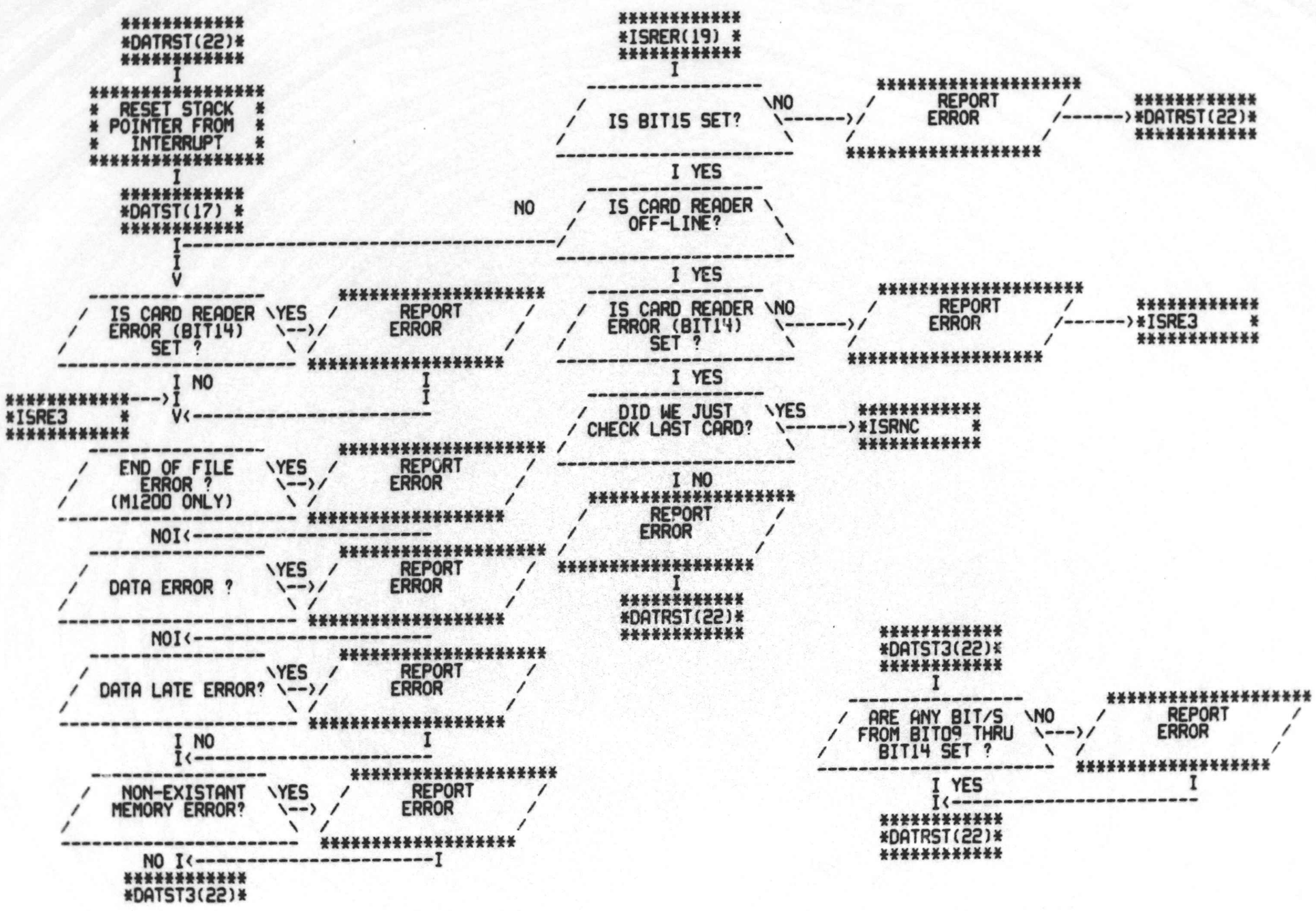

*DATST(16) *
UNPACKED MODE EXAMPLE
TYPE LEAD-IN POSITIONAL MESSAGES
INITIALIZE CARD COUNT AND COLUMN COUNT TO ZERO
ARE WE TESTING BINARY DECK ?
YES
LOAD BINARY DATA TABLE POINTERS
NO
LOAD ALPHANUMERIC DATA TABLE POINTERS
INIT
INIT(45)
SET UP RETURN ADDR. FOR INTERRUPT SERVICING
SET CARD SIZE AND WORK- 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
SET UP FOR
ACCEPTANCE OF
PACK MODE
NO
WAS IMAGE MODE SELECTED ALSO?
YES
READ
A
CARD
*BKGND
HAVE WE FINISHED READING A CARD YET ?
NO
YES
IS CONTROLLER READY ?
NO
REPORT ERROR
YES
*ISR(19)
NO
HAD WE SELECTED DATA PACK MODE?
YES
*PSR


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


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


*ISRDE(19) *
IS THIS THE FIRST CARD ?
YES
NO
CALCULATE PRESENT POSIT- ION OF IMPORT.
RESET CARD COUNTER (CDCNT)
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 ERROR (BIT14) SET ?
REPORT ERROR
ISRE3
END OF FILE ERROR ? (M1200 ONLY)
REPORT ERROR
DATA ERROR ?
REPORT ERROR
DATA LATE ERROR?
REPORT ERROR
NON-EXISTANT MEMORY ERROR?
REPORT ERROR
DATST3(22)
ISRER(19)
IS BIT15 SET?
REPORT ERROR
DATRST(22)
IS CARD READER OFF-LINE?
IS CARD READER ERROR (BIT14) SET ?
REPORT ERROR
ISRE3
DID WE JUST CHECK LAST CARD?
ISRNC
REPORT ERROR
DATRST(22)
DATST3(22)
ARE ANY BIT/S FROM BIT09 THRU BIT14 SET ?
REPORT ERROR
DATRST(22)
YES
NO

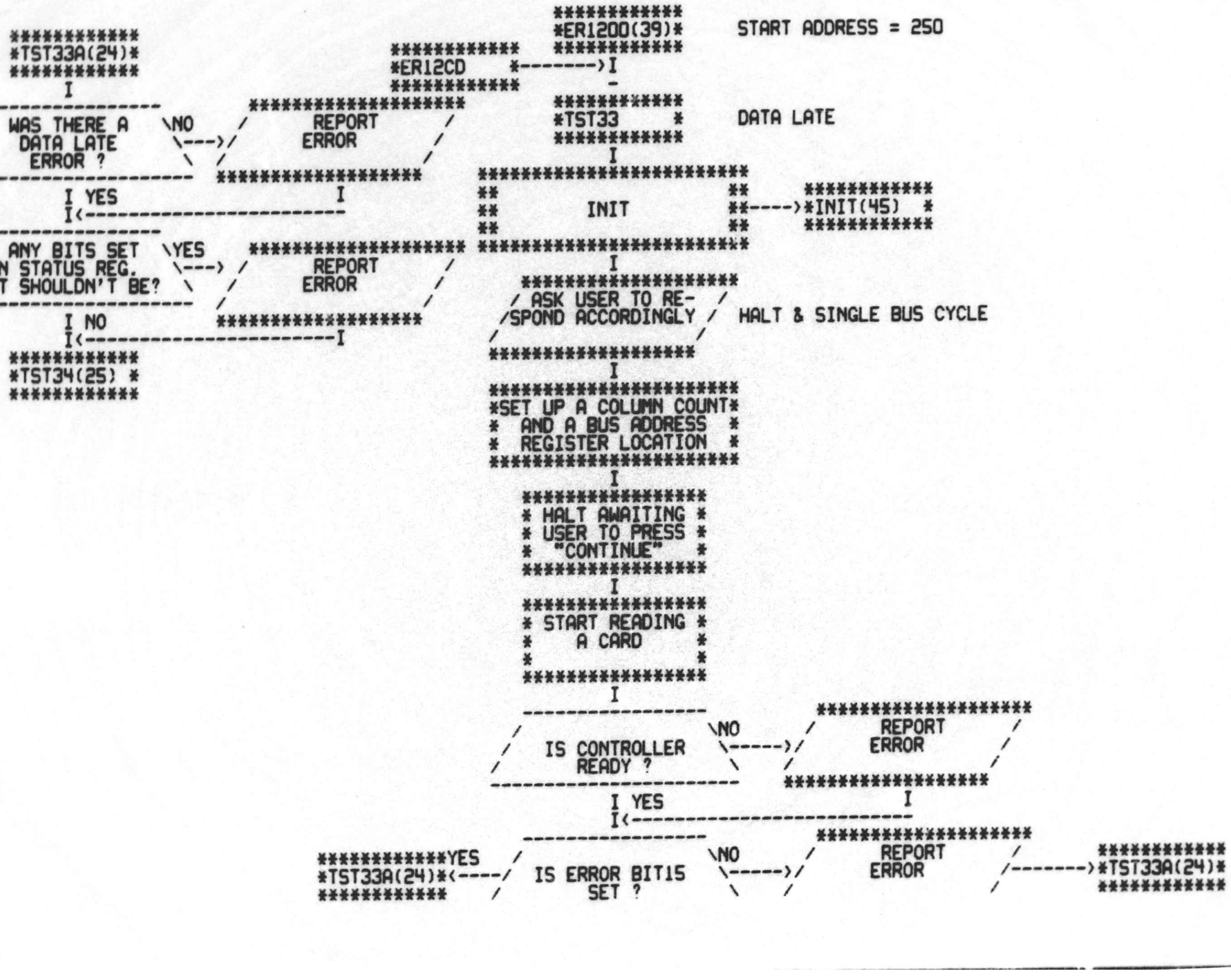
```
*-------------------------------------------------*
  DATA RELIABILITY TESTING FOR PACKED MODE WILL

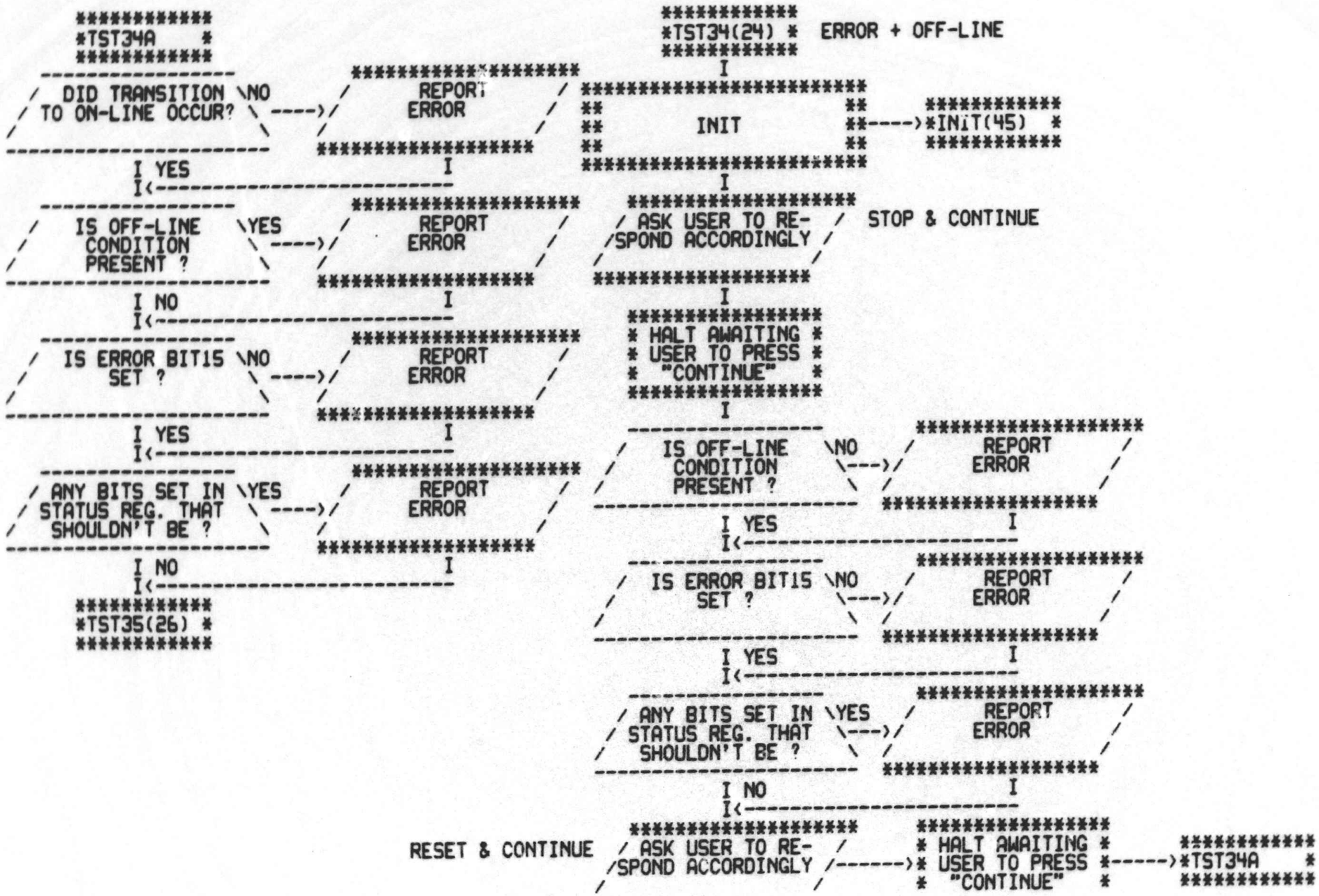
          ************                  ************
  START AT *DATST(17) * & BRANCH OFF TO*PSR        *
          ************                  ************

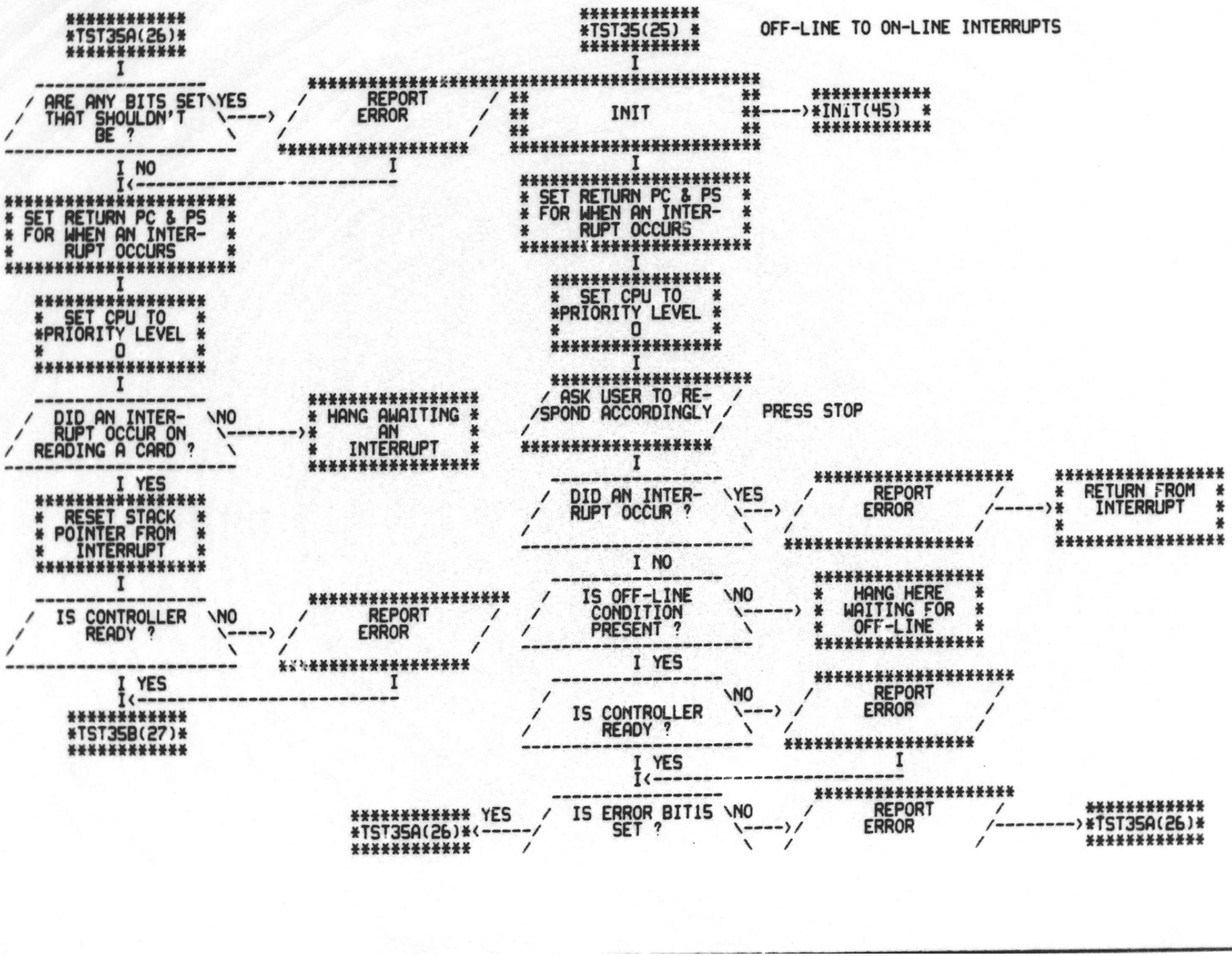
  WHERE DATA WILL BE HANDLED AS OUTLINED IN

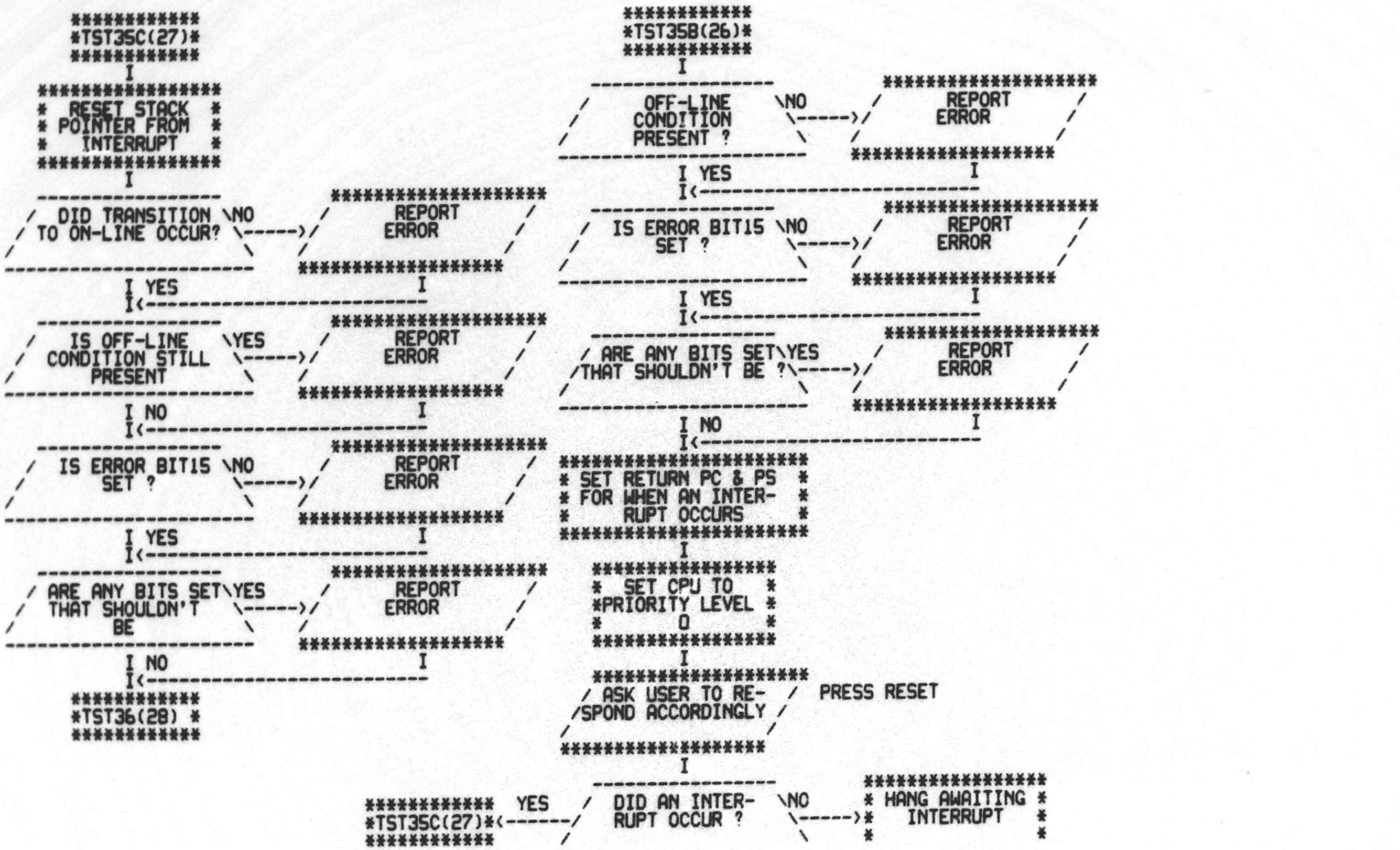
                      ************
  SECTION STARTING AT *ISR(19)    *WITH ONLY ONE
                      ************

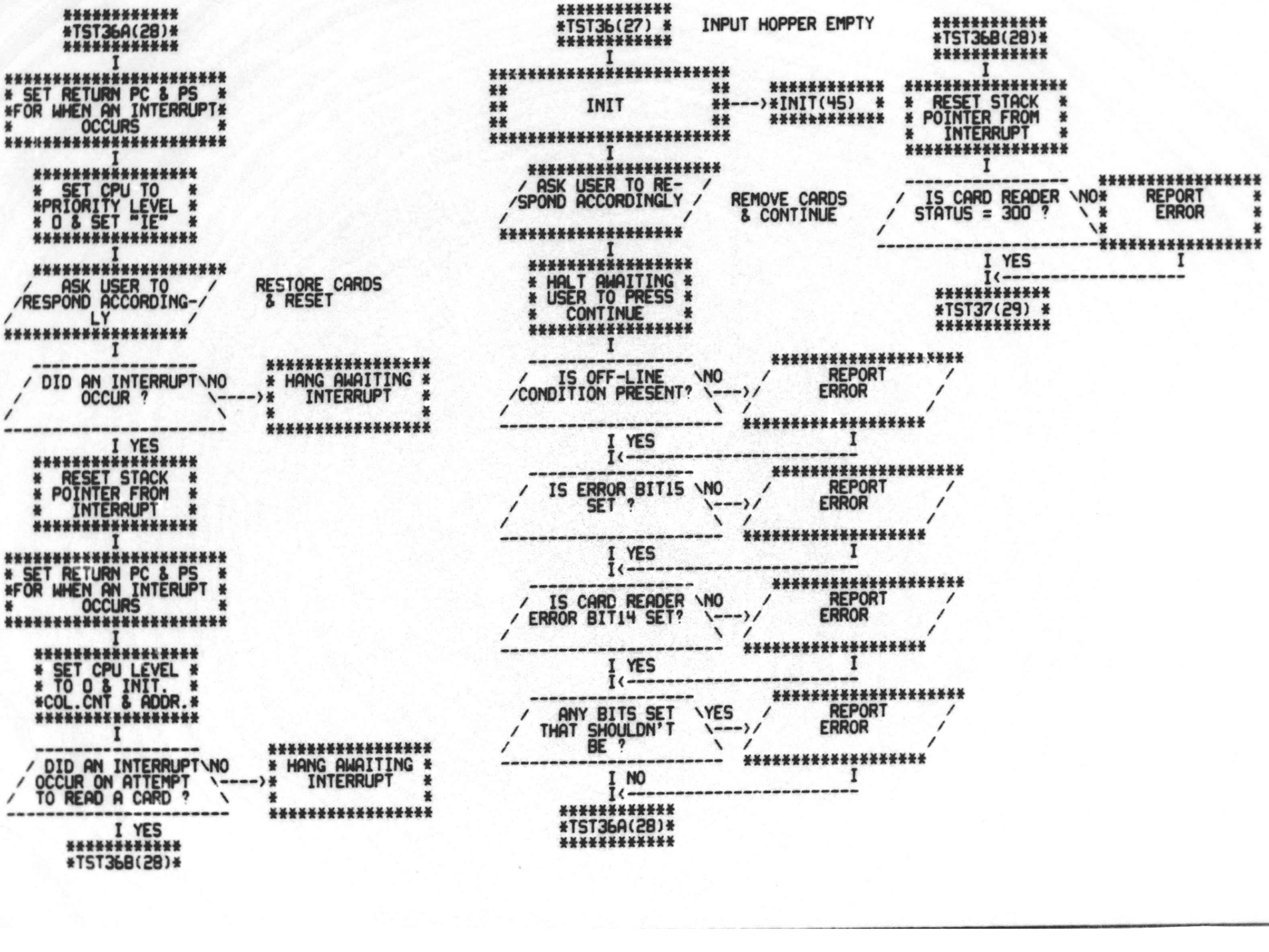
  EXCEPTION:  DATA IS HANDLED USING BYTE CONSTRUCTION
```

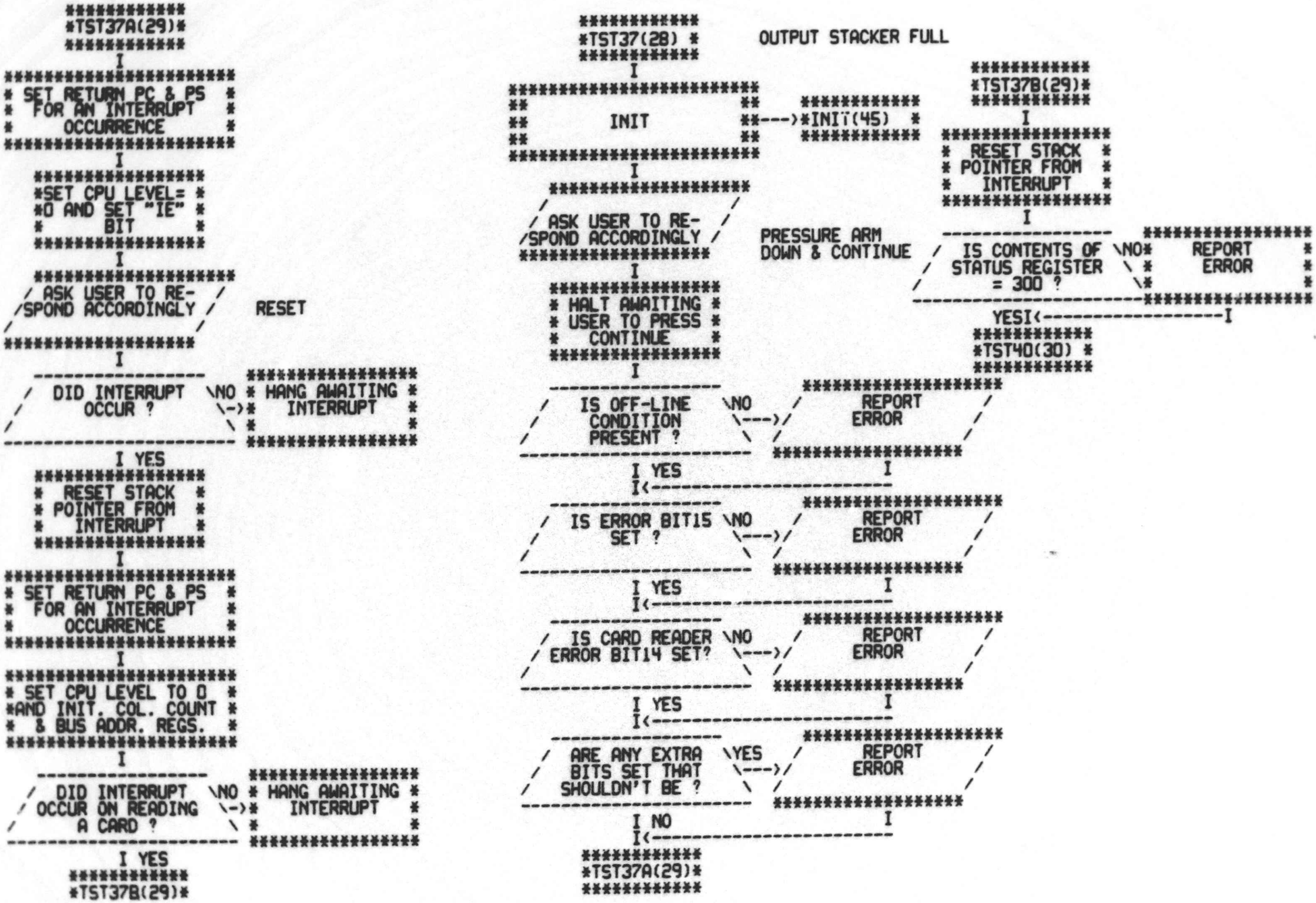

TST33A(24)
*ER12CD
ER1200(39)
START ADDRESS = 250
WAS THERE A DATA LATE ERROR ?
NO
REPORT ERROR
*TST33 *
DATA LATE
I YES
INIT
*INIT(45) *
ANY BITS SET IN STATUS REG. THAT SHOULDN'T BE?
YES
REPORT ERROR
I NO
ASK USER TO RE-SPOND ACCORDINGLY
HALT & SINGLE BUS CYCLE
*TST34(25) *
SET UP A COLUMN COUNT
* AND A BUS ADDRESS *
* REGISTER LOCATION *
* HALT AWAITING *
* USER TO PRESS *
* "CONTINUE" *
* START READING *
* A CARD *
IS CONTROLLER READY ?
NO
REPORT ERROR
I YES
IS ERROR BIT15 SET ?
NO
REPORT ERROR
YES
TST33A(24)
TST33A(24)

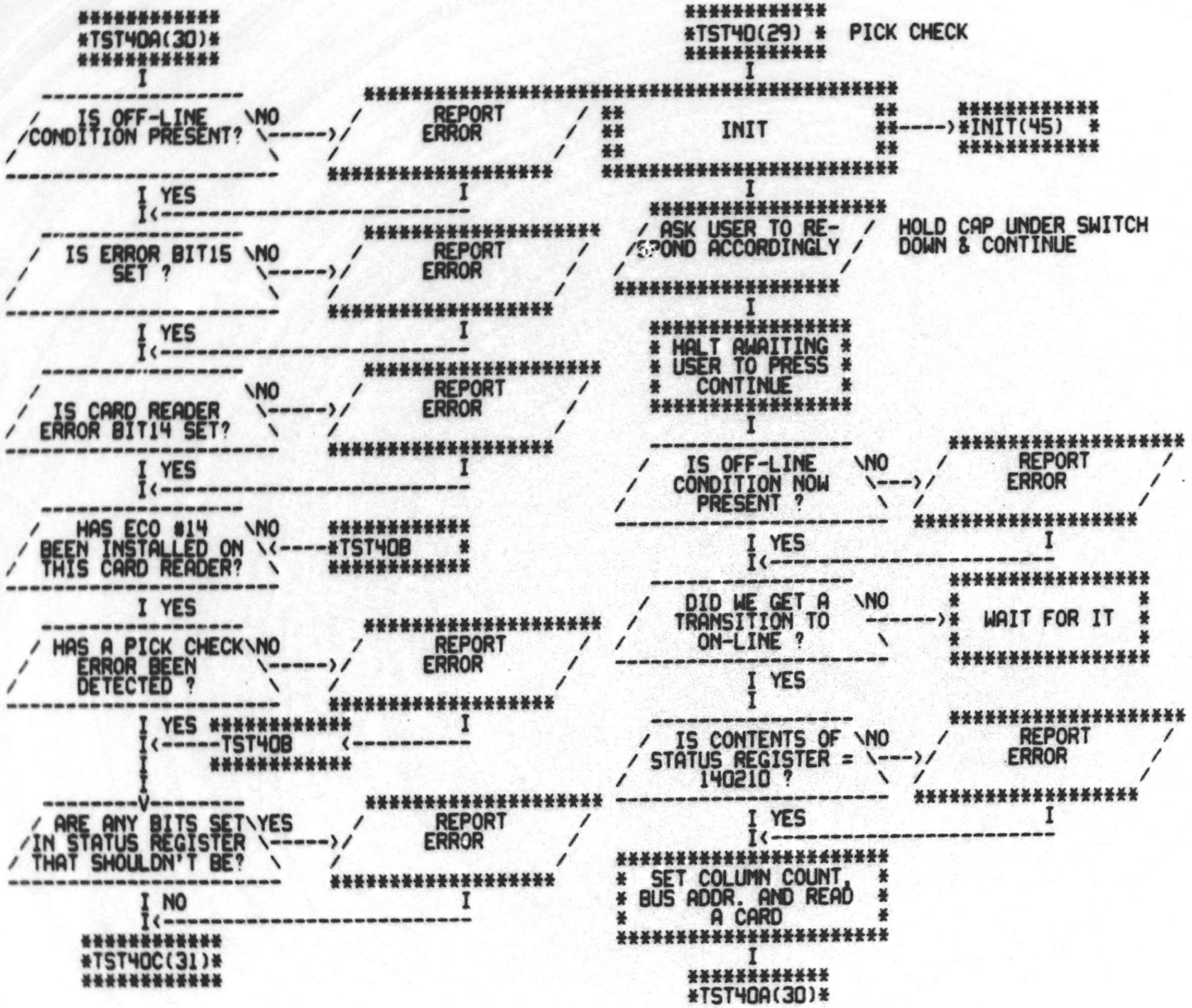

*TST34A *
DID TRANSITION TO ON-LINE OCCUR?
NO
REPORT ERROR
YES
IS OFF-LINE CONDITION PRESENT ?
YES
REPORT ERROR
NO
IS ERROR BIT15 SET ?
NO
REPORT ERROR
YES
ANY BITS SET IN STATUS REG. THAT SHOULDN'T BE ?
YES
REPORT ERROR
NO
*TST35(26) *
*TST34(24) *
ERROR + OFF-LINE
INIT
*INIT(45) *
ASK USER TO RE-SPOND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

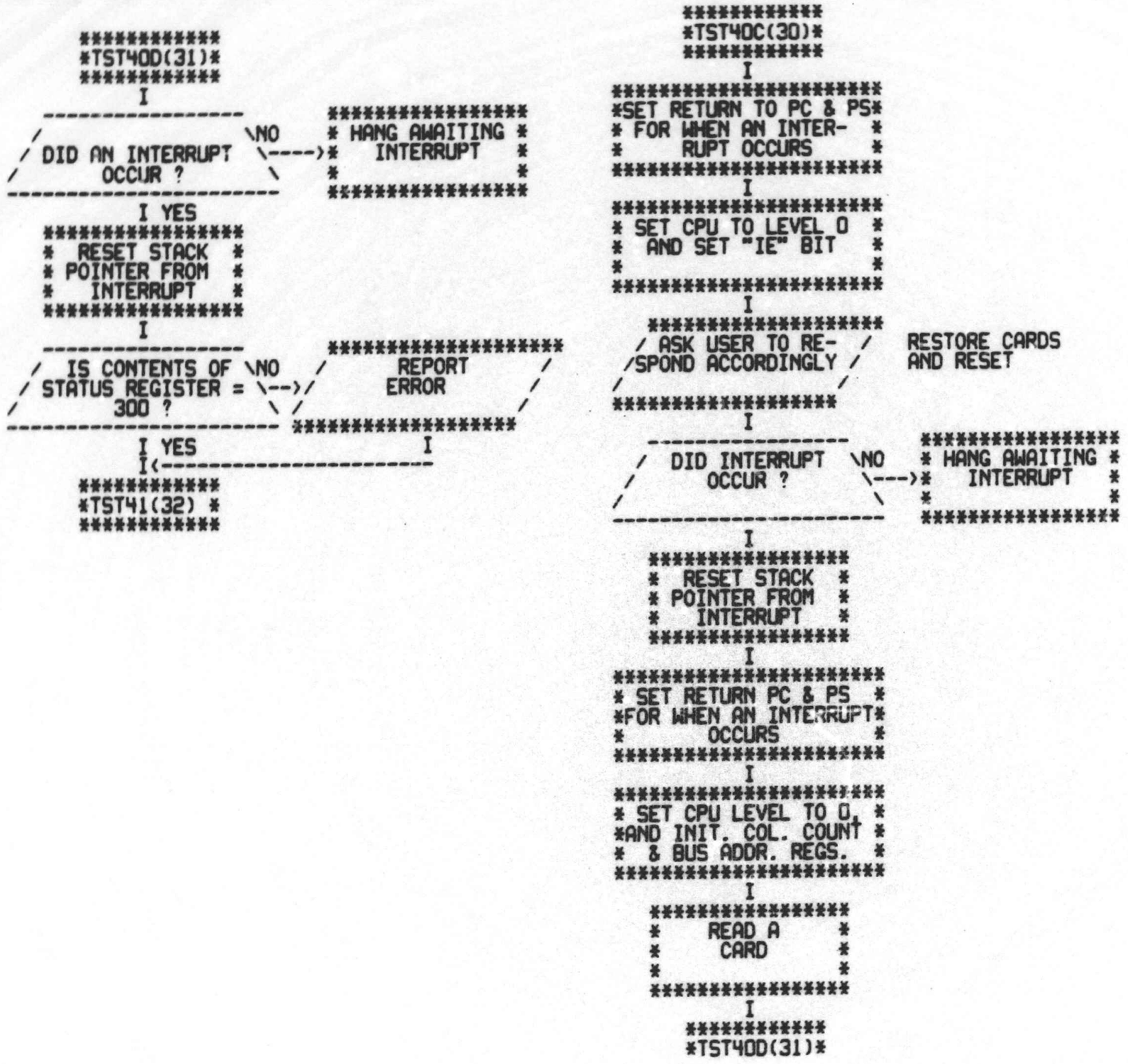

TST35A(26)
ARE ANY BITS SET THAT SHOULDN'T BE ?
YES
REPORT ERROR
NO
SET RETURN PC & PS FOR WHEN AN INTER-RUPT OCCURS
SET CPU TO *PRIORITY LEVEL 0
DID AN INTER-RUPT OCCUR ON READING A CARD ?
NO
HANG AWAITING AN INTERRUPT
YES
RESET STACK POINTER FROM INTERRUPT
IS CONTROLLER READY ?
NO
REPORT ERROR
YES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

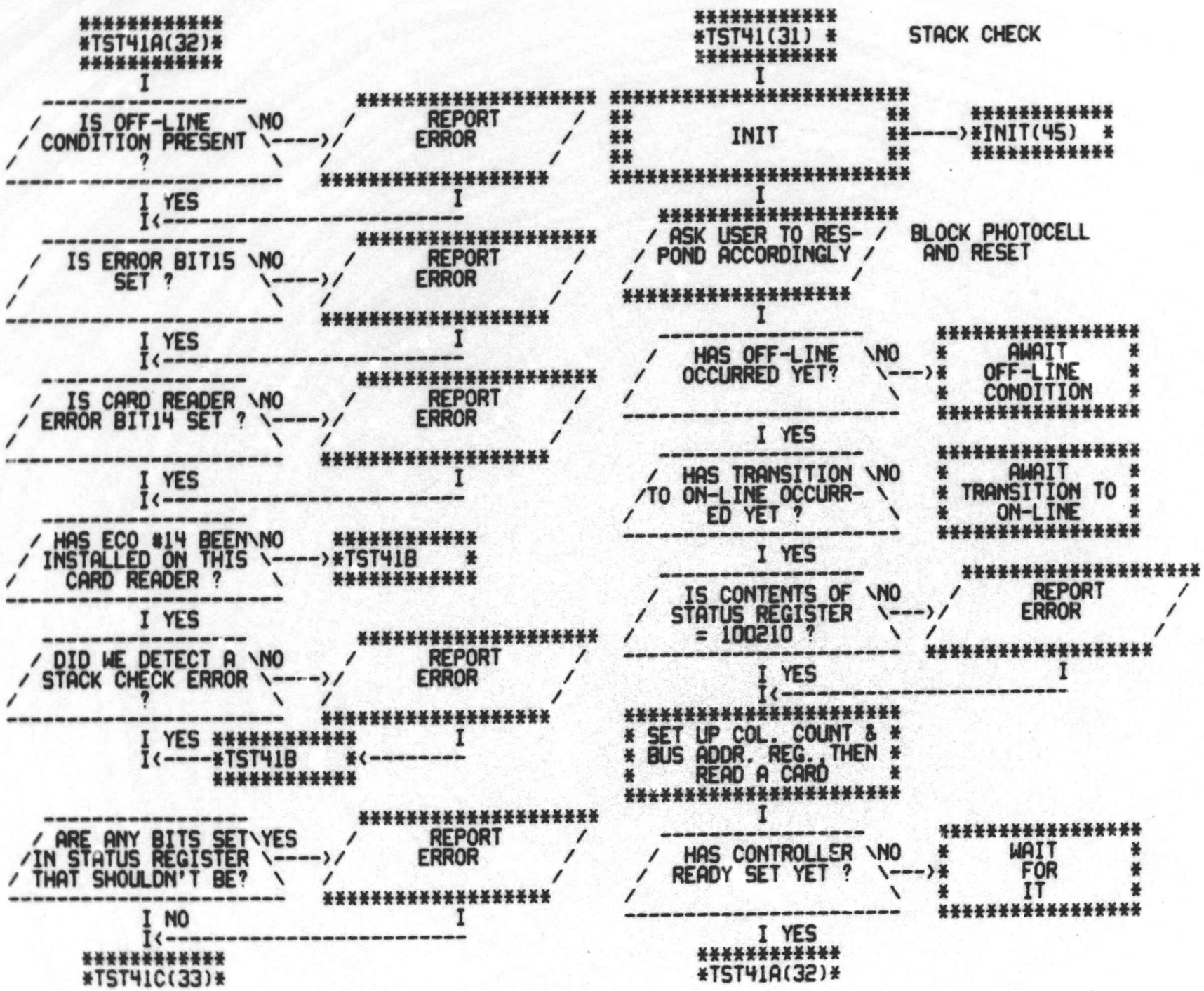

TST35C(27)
RESET STACK POINTER FROM INTERRUPT
DID TRANSITION TO ON-LINE OCCUR? \NO
REPORT ERROR
YES
IS OFF-LINE CONDITION STILL PRESENT \YES
REPORT ERROR
NO
IS ERROR BIT15 SET ? \NO
REPORT ERROR
YES
ARE ANY BITS SET THAT SHOULDN'T BE \YES
REPORT ERROR
NO
*TST36(28) *
TST35B(26)
OFF-LINE CONDITION PRESENT ? \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
TST35C(27)
DID AN INTER-RUPT OCCUR ? \NO
HANG AWAITING INTERRUPT
YES

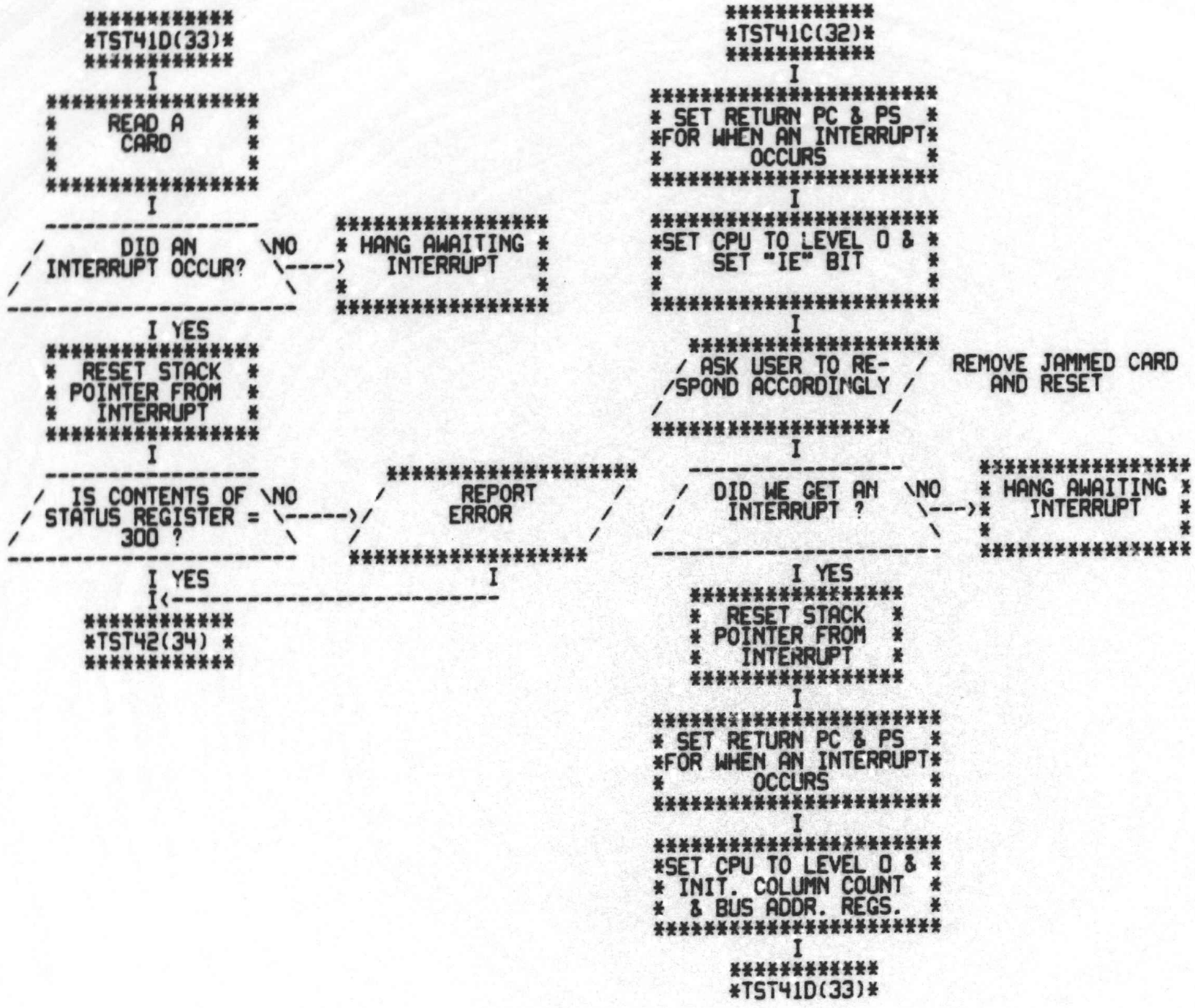

TST36A(28)
SET RETURN PC & PS FOR WHEN AN INTERRUPT OCCURS
SET CPU TO PRIORITY LEVEL 0 & SET "IE"
ASK USER TO RESPOND ACCORDINGLY
RESTORE CARDS & RESET
DID AN INTERRUPT OCCUR ?
NO
HANG AWAITING INTERRUPT
YES
RESET STACK POINTER FROM INTERRUPT
SET RETURN PC & PS FOR WHEN AN INTERUPT OCCURS
SET CPU LEVEL TO 0 & INIT. COL.CNT & ADDR.
DID AN INTERRUPT OCCUR ON ATTEMPT TO READ A CARD ?
NO
HANG AWAITING INTERRUPT
YES
TST368(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?
NO
REPORT ERROR
YES
IS ERROR BIT15 SET ?
NO
REPORT ERROR
YES
IS CARD READER ERROR BIT14 SET?
NO
REPORT ERROR
YES
ANY BITS SET THAT SHOULDN'T BE ?
YES
REPORT ERROR
NO
TST36A(28)
TST368(28)
RESET STACK POINTER FROM INTERRUPT
IS CARD READER STATUS = 300 ?
NO
REPORT ERROR
YES
*TST37(29) *

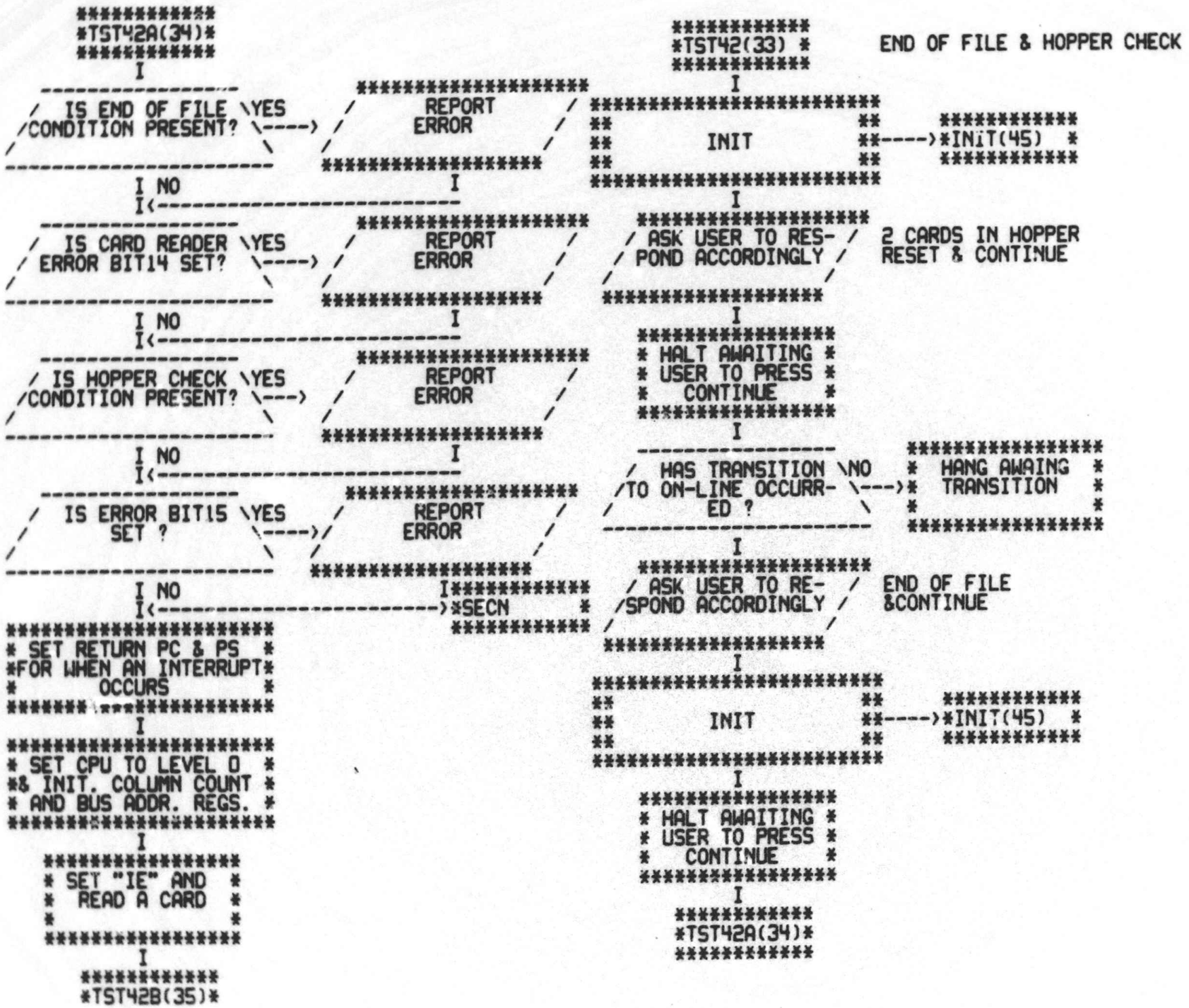

TST37A(29)
SET RETURN PC & PS FOR AN INTERRUPT OCCURRENCE
SET CPU LEVEL= *0 AND SET "IE" BIT
ASK USER TO RE-SPOND ACCORDINGLY
RESET
DID INTERRUPT OCCUR ?
NO
HANG AWAITING INTERRUPT
YES
RESET STACK POINTER FROM INTERRUPT
SET RETURN PC & PS FOR AN INTERRUPT OCCURRENCE
SET CPU LEVEL TO 0 AND INIT. COL. COUNT & BUS ADDR. REGS.
DID INTERRUPT OCCUR ON READING A CARD ?
NO
HANG AWAITING INTERRUPT
YES
TST37B(29)
*TST37(28) *
INIT
*INIT(45) *
OUTPUT STACKER FULL
ASK USER TO RE-SPOND ACCORDINGLY
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 ?
YES
REPORT ERROR
NO
TST37B(29)
RESET STACK POINTER FROM INTERRUPT
IS CONTENTS OF STATUS REGISTER = 300 ?
NO
REPORT ERROR
YES
*TST40(30) *
TST37A(29)

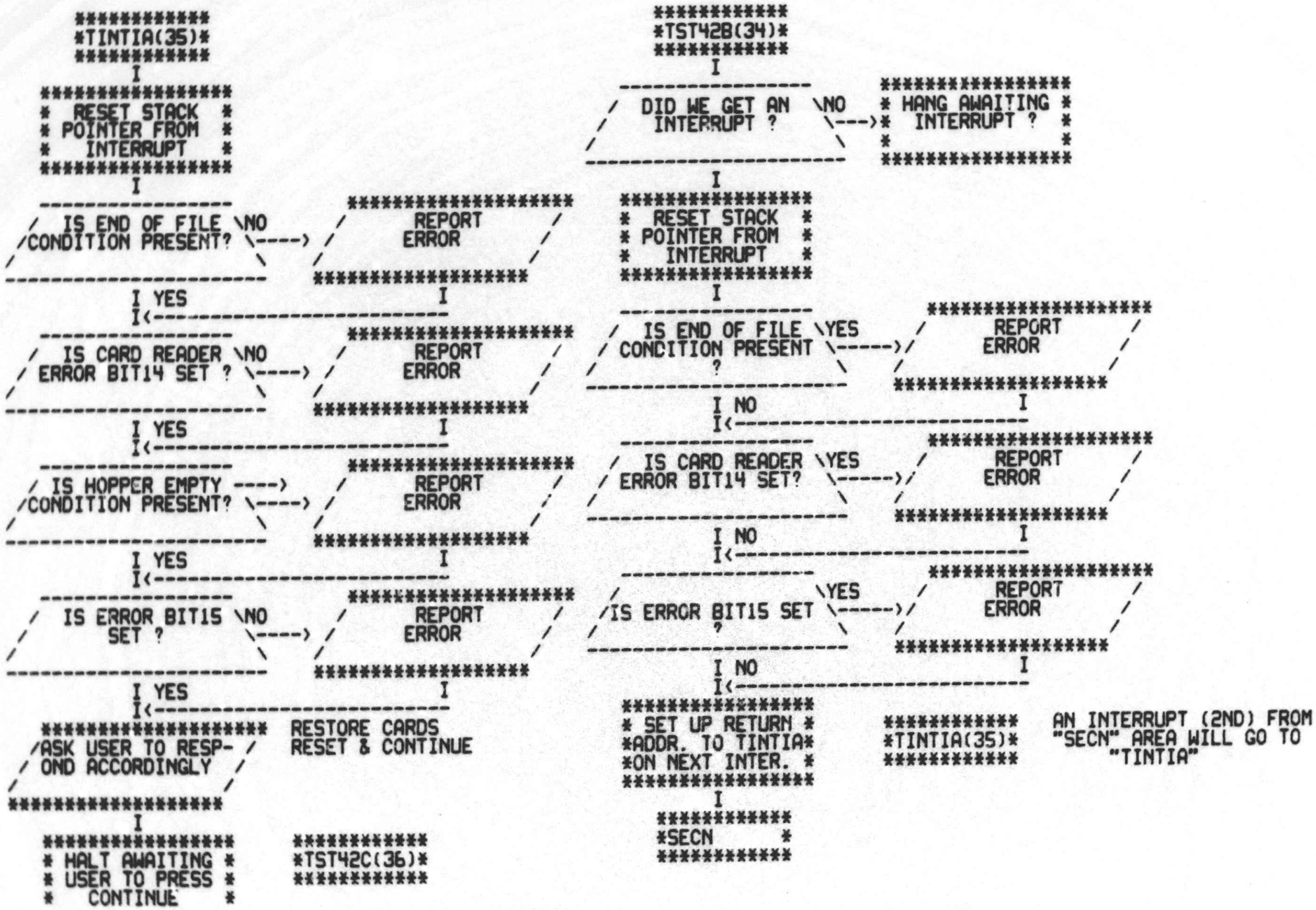

TST40A(30)
IS OFF-LINE CONDITION PRESENT?
NO
REPORT ERROR
YES
IS ERROR BIT15 SET ?
NO
REPORT ERROR
YES
IS CARD READER ERROR BIT14 SET?
NO
REPORT ERROR
YES
HAS ECO #14 BEEN INSTALLED ON THIS CARD READER?
NO
*TST40B
YES
HAS A PICK CHECK ERROR BEEN DETECTED ?
NO
REPORT ERROR
YES
*TST40B
ARE ANY BITS SET IN STATUS REGISTER THAT SHOULDN'T BE?
YES
REPORT ERROR
NO
TST40C(31)
TST40(29)
PICK CHECK
INIT
INIT(45)
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)

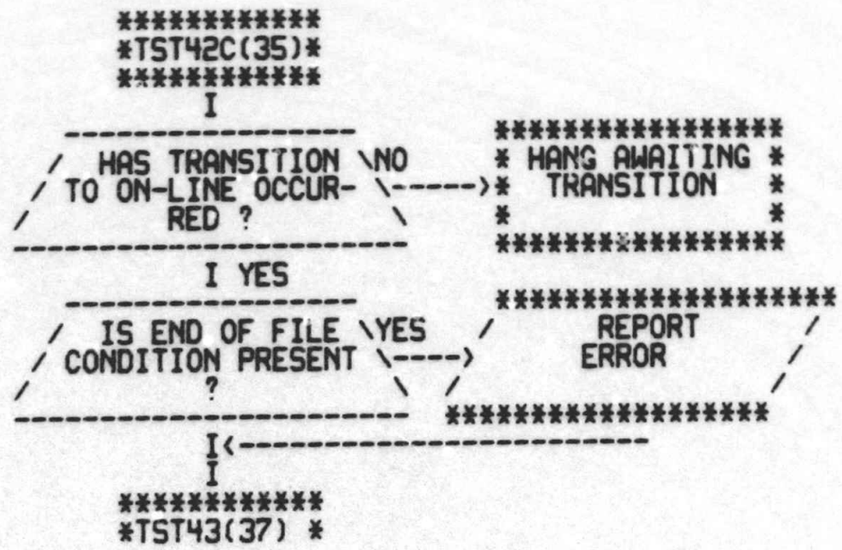

TST40D(31)
DID AN INTERRUPT OCCUR ?
NO
* HANG AWAITING * INTERRUPT *
I YES
* RESET STACK * POINTER FROM * INTERRUPT *
IS CONTENTS OF STATUS REGISTER = 300 ?
NO
REPORT ERROR
I YES
*TST41(32) *
TST40C(30)
SET RETURN TO PC & PS FOR WHEN AN INTER- RUPT OCCURS
* SET CPU TO LEVEL 0 AND SET "IE" BIT *
ASK USER 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)

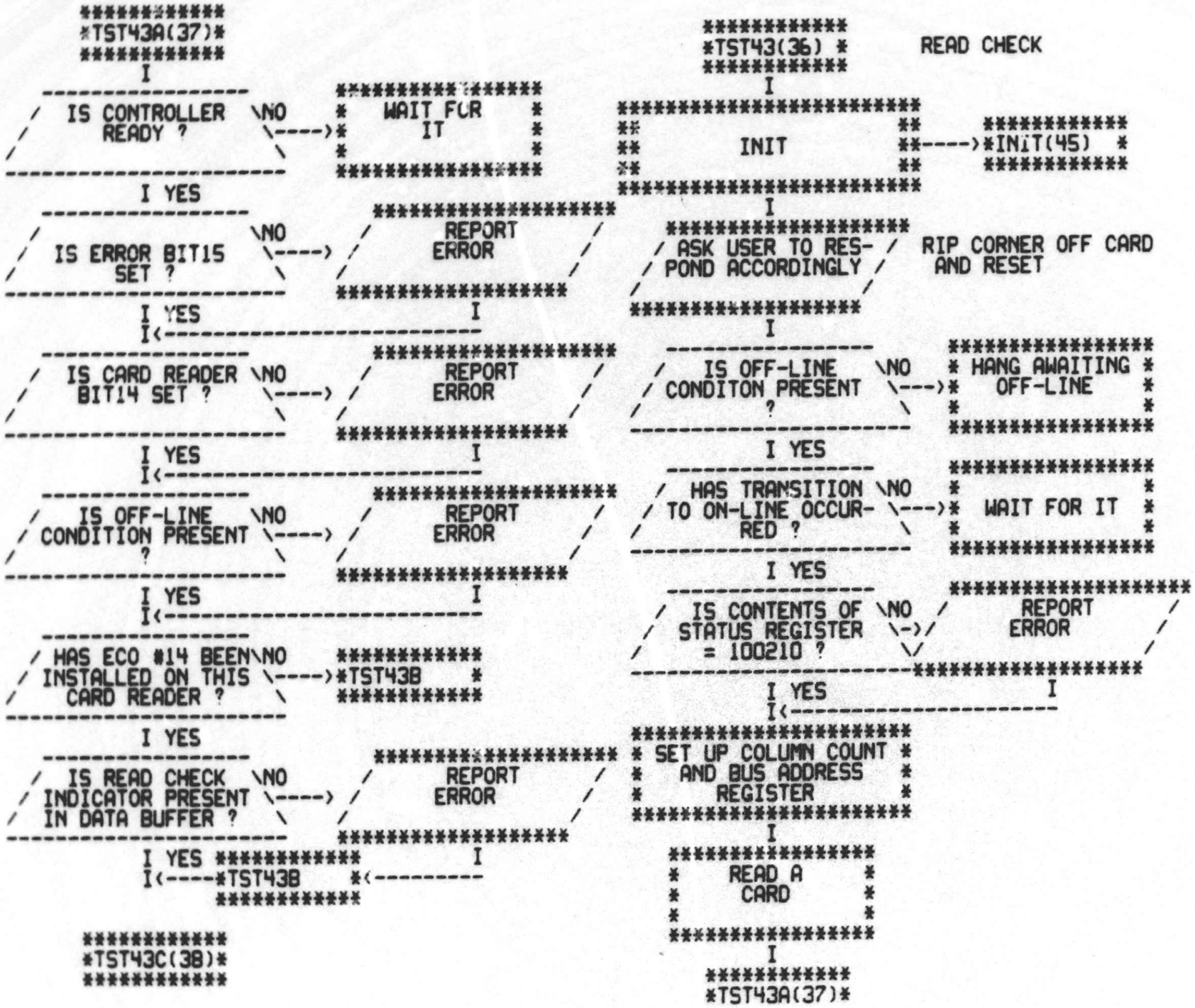

TST41A(32)
IS OFF-LINE CONDITION PRESENT ?
NO
REPORT ERROR
YES
IS ERROR BIT15 SET ?
NO
REPORT ERROR
YES
IS CARD READER ERROR BIT14 SET ?
NO
REPORT ERROR
YES
HAS ECO #14 BEEN INSTALLED ON THIS CARD READER ?
NO
*TST41B *
YES
DID WE DETECT A STACK CHECK ERROR ?
NO
REPORT ERROR
YES
*TST41B *
ARE ANY BITS SET IN STATUS REGISTER THAT SHOULDN'T BE?
YES
REPORT ERROR
NO
TST41C(33)
*TST41(31) *
STACK CHECK
INIT
*INIT(45) *
ASK USER TO RES- POND ACCORDINGLY
BLOCK PHOTOCELL AND RESET
HAS OFF-LINE OCCURRED YET?
NO
AWAIT OFF-LINE CONDITION
YES
HAS TRANSITION TO ON-LINE OCCURR- ED 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)

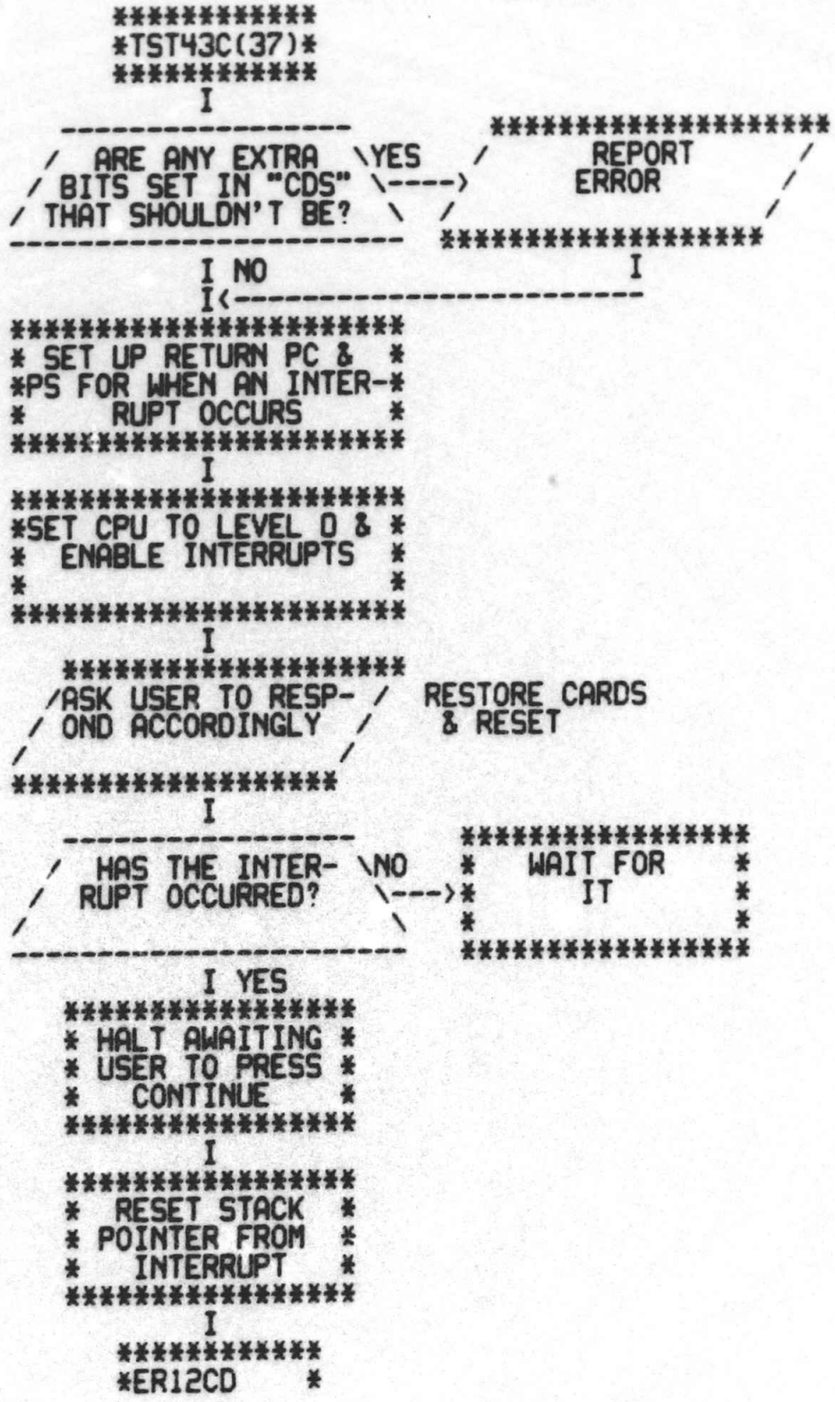

TST41D(33)
READ A CARD
DID AN INTERRUPT OCCUR?
NO
HANG AWAITING INTERRUPT
YES
RESET STACK POINTER FROM INTERRUPT
IS CONTENTS OF STATUS REGISTER = 300 ?
NO
REPORT ERROR
YES
TST42(34)
TST41C(32)
SET RETURN PC & PS FOR WHEN AN INTERRUPT OCCURS
SET CPU TO LEVEL 0 & SET "IE" BIT
ASK USER TO RESPOND ACCORDINGLY
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 AWAING 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
I YES
IS CARD READER ERROR BIT14 SET ?
REPORT ERROR
I YES
IS HOPPER EMPTY CONDITION PRESENT?
REPORT ERROR
I YES
IS ERROR BIT15 SET ?
REPORT ERROR
I YES
ASK USER TO RESPOND ACCORDINGLY
RESTORE CARDS RESET & CONTINUE
HALT AWAITING USER TO PRESS CONTINUE
TST42C(36)
TST42B(34)
DID WE GET AN INTERRUPT ?
HANG AWAITING INTERRUPT ?
RESET STACK POINTER FROM INTERRUPT
IS END OF FILE CONDITION PRESENT ?
REPORT ERROR
I NO
IS CARD READER ERROR BIT14 SET?
REPORT ERROR
I NO
IS ERROR BIT15 SET ?
REPORT ERROR
I 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)

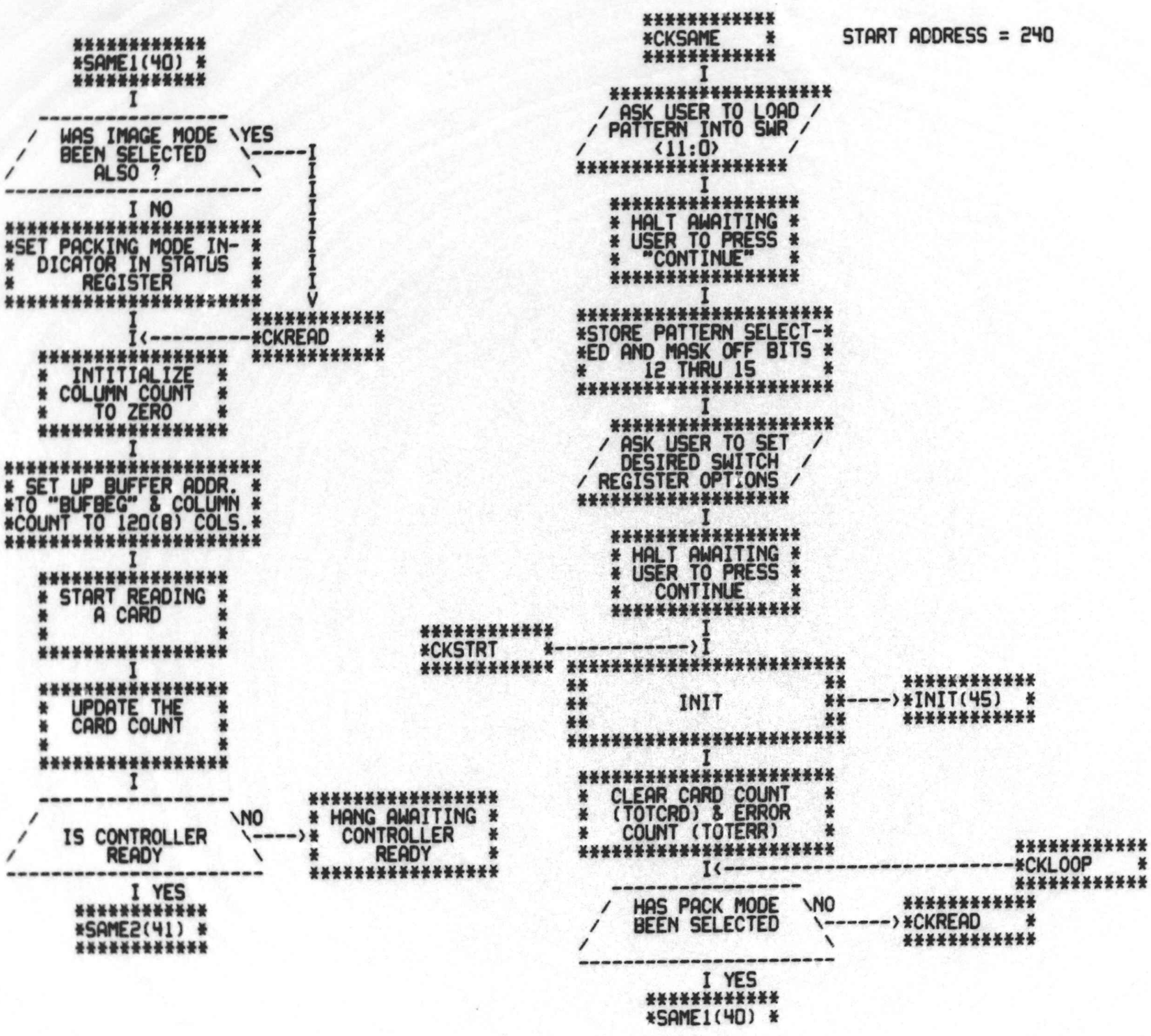

TST43C(37)
ARE ANY EXTRA BITS SET IN "CDS" THAT SHOULDN'T BE?
YES
REPORT ERROR
NO
* SET UP RETURN PC & PS FOR WHEN AN INTER-RUPT OCCURS *
*SET CPU TO LEVEL 0 & ENABLE INTERRUPTS *
/ASK USER TO RESP- OND ACCORDINGLY /
RESTORE CARDS & RESET
HAS THE INTER- RUPT OCCURRED?
NO
WAIT FOR IT
YES
* HALT AWAITING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

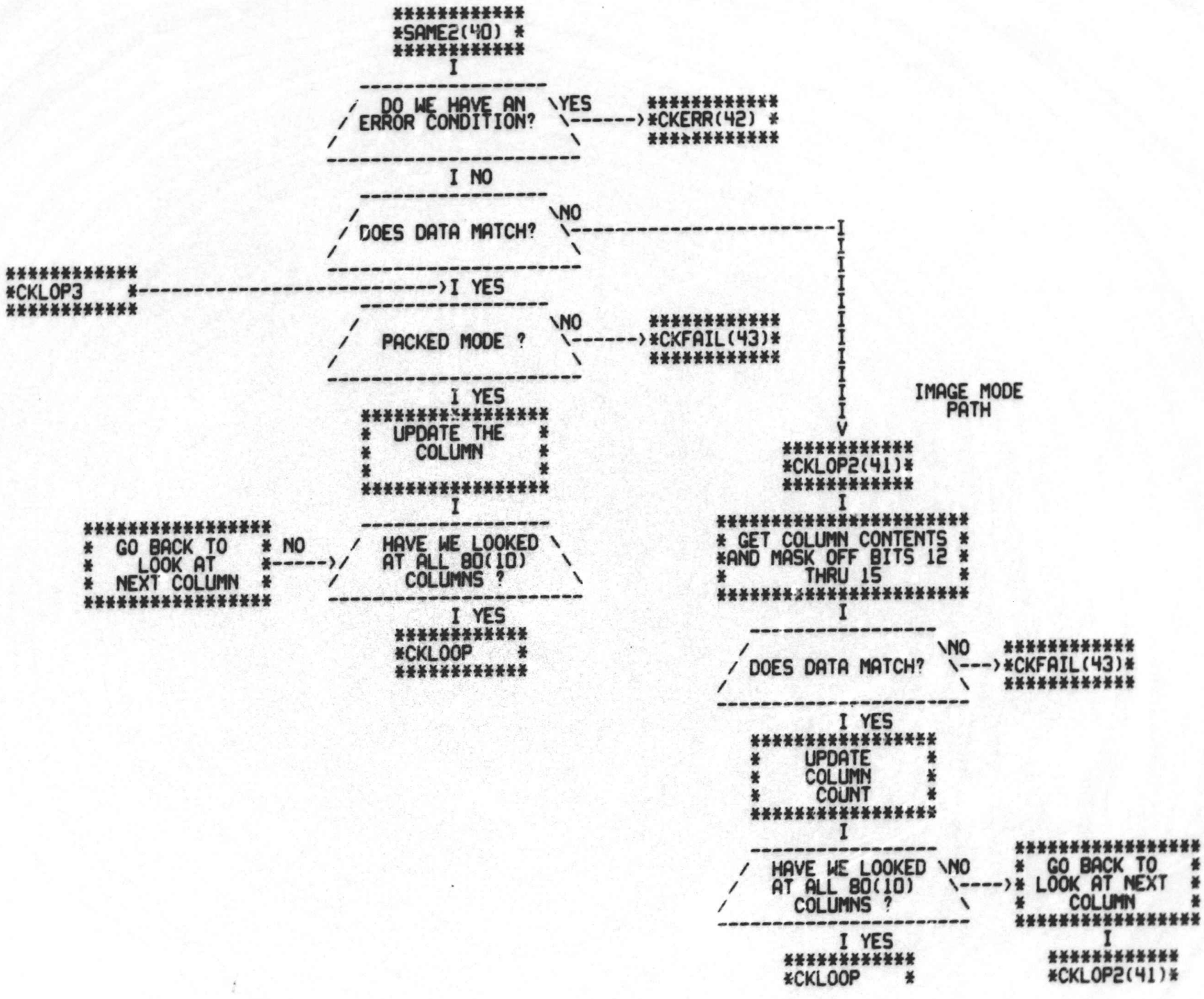
```
*------------------------------------------------------------*
 ERROR FUNCTION TESTING OF CARD READER MODELS M1000 OR
 M200 IS IDENTICAL TO THAT OF AN M1200 AS OUTLINED

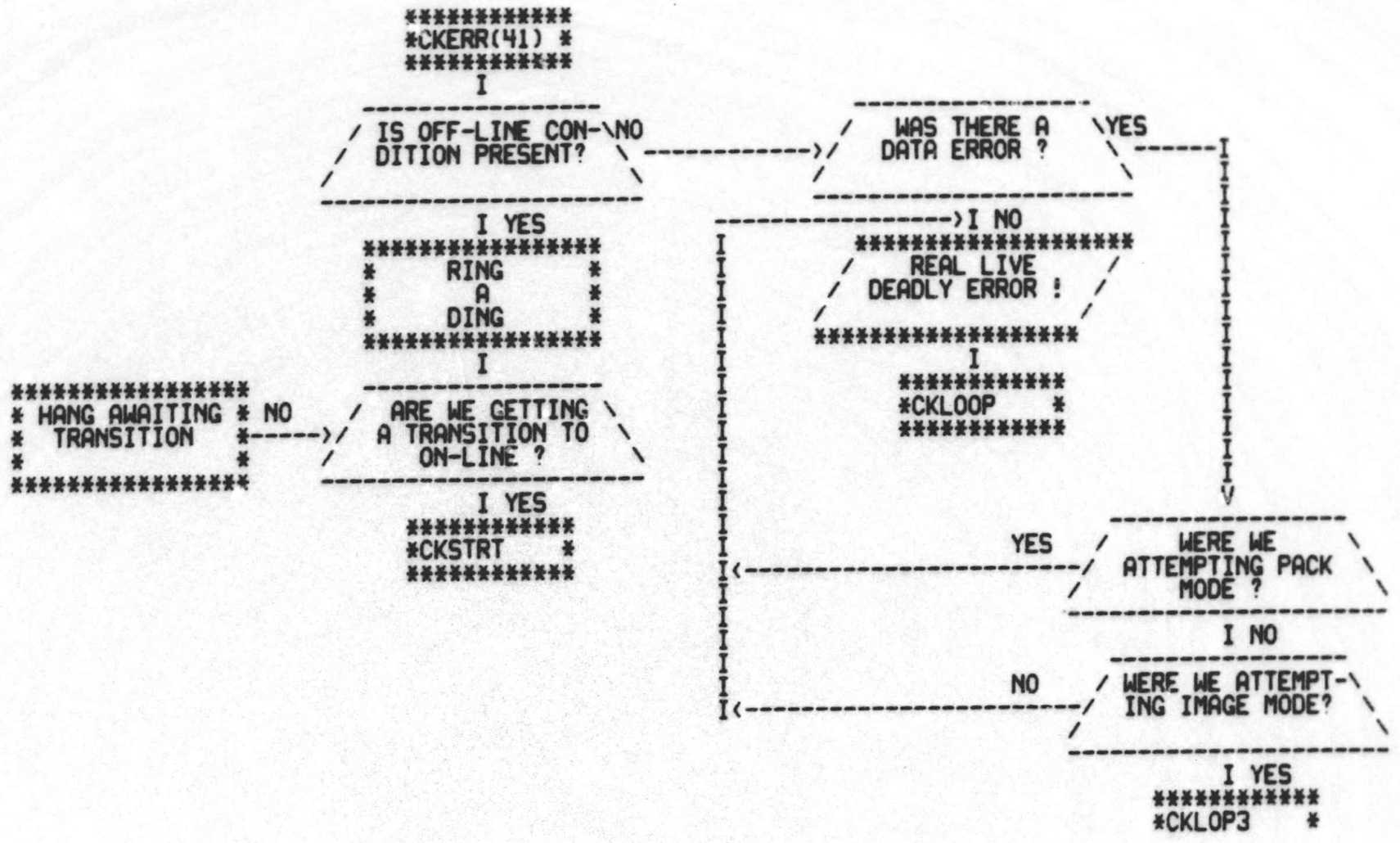
            ************
STARTING AT*ER1200(24)*   WITH ONLY ONE EXCEPTION:
            ************

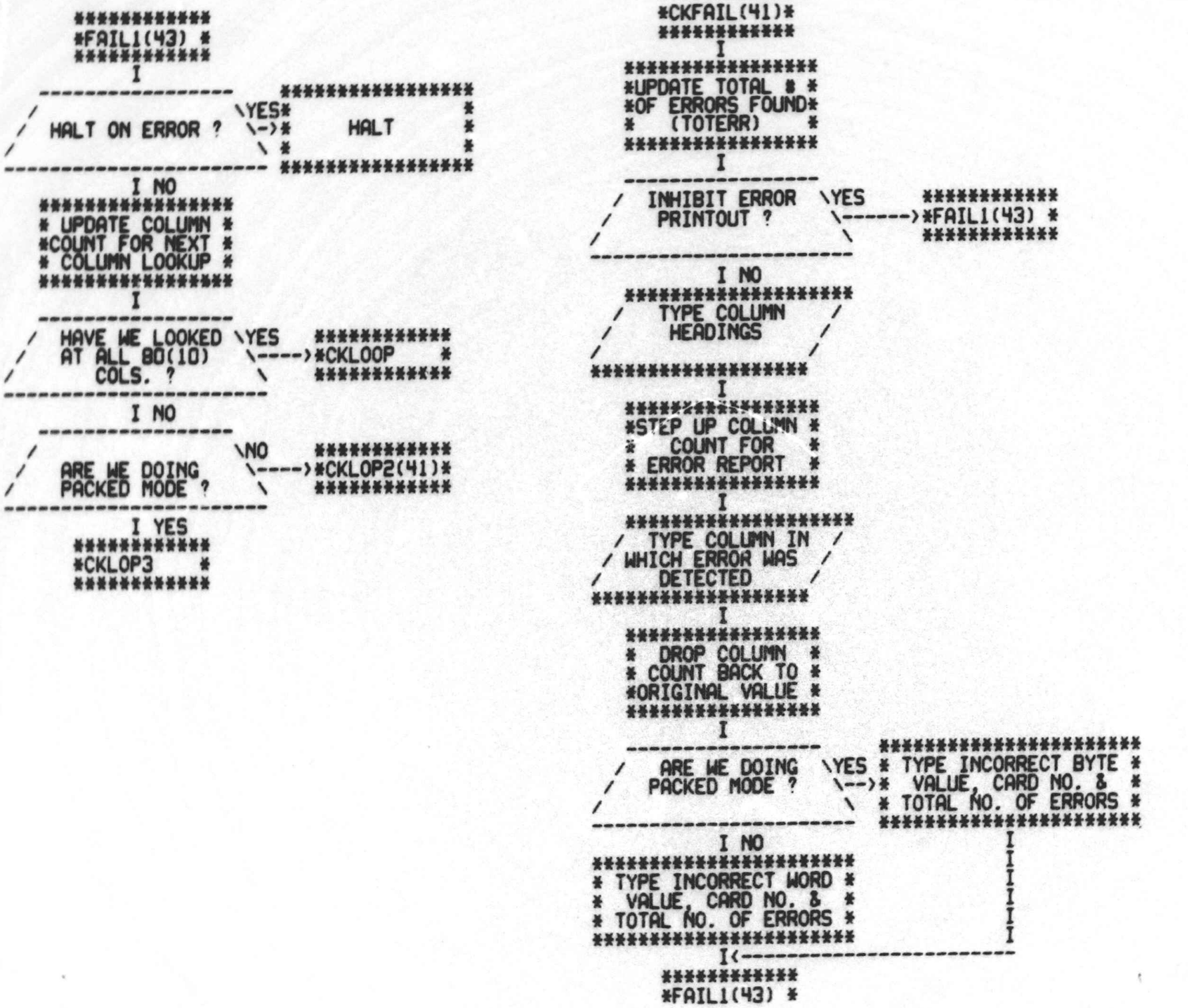
************
*TST42(34) * IS NOT EXCUTED [START ADDRESS = 210]
************
```

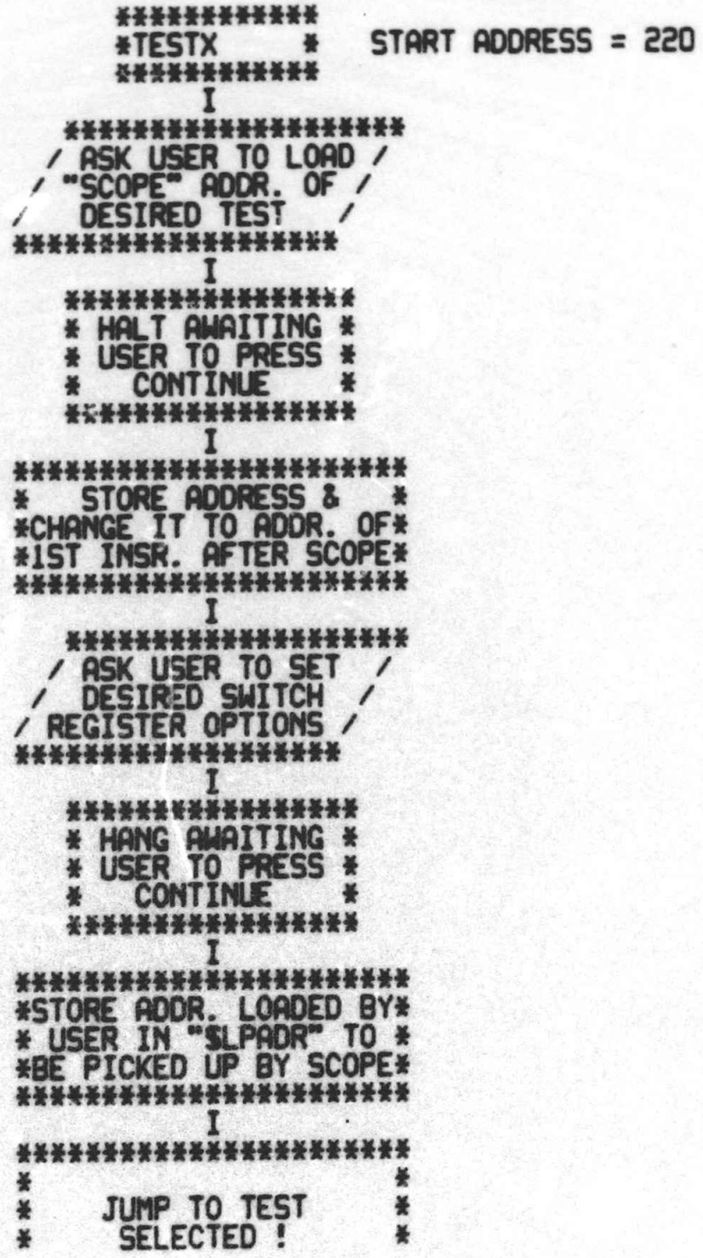
START ADDRESS = 240

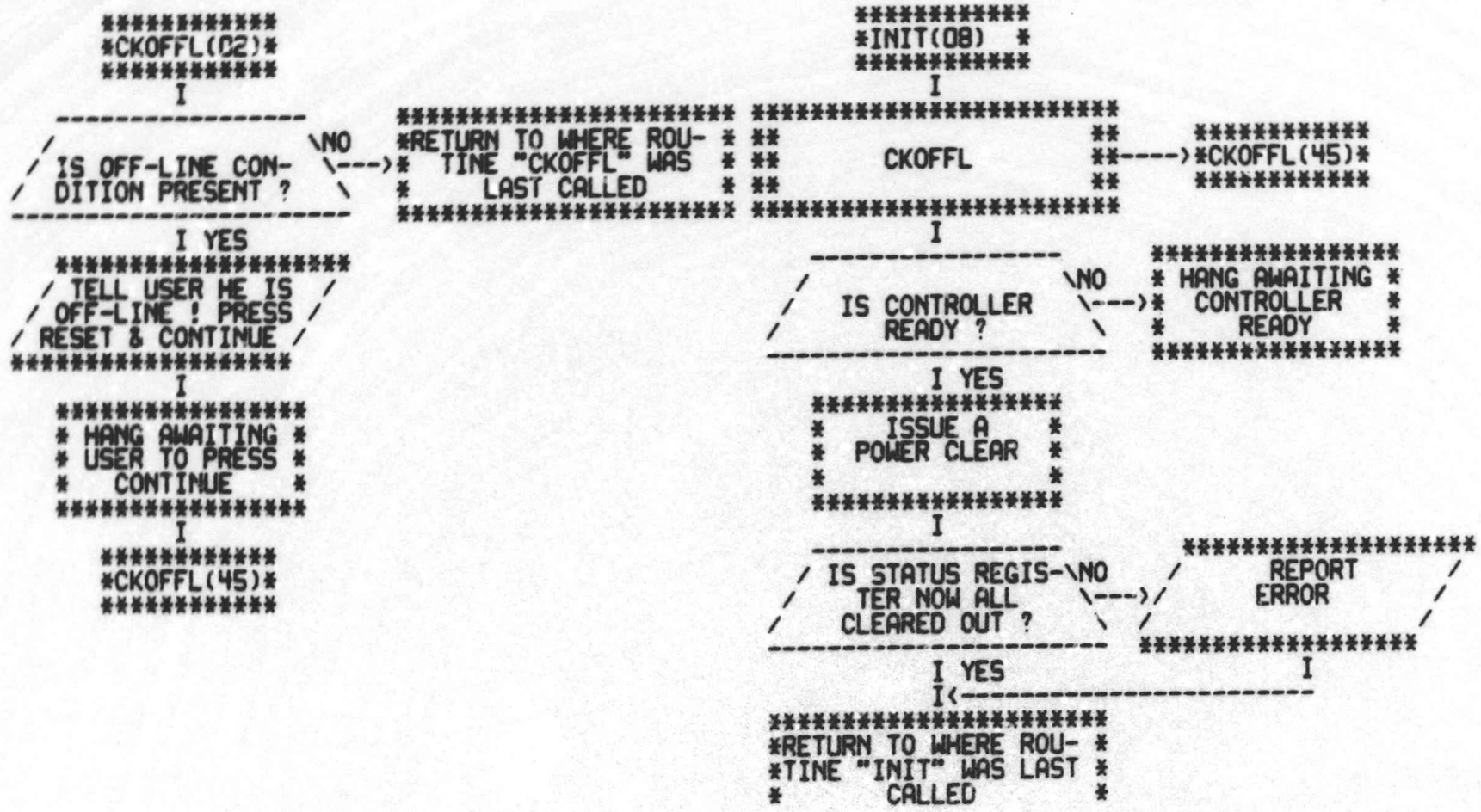



*SAME2(40) *
DO WE HAVE AN ERROR CONDITION?
YES
*CKERR(42) *
NO
DOES DATA MATCH?
NO
*CKLOP3 *
YES
PACKED MODE ?
NO
CKFAIL(43)
YES
IMAGE MODE PATH
* UPDATE THE COLUMN *
* GO BACK TO LOOK AT NEXT COLUMN *
NO
HAVE WE LOOKED AT ALL 80(10) COLUMNS ?
YES
*CKLOOP *
CKLOP2(41)
* GET COLUMN CONTENTS *
*AND MASK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


*CKERR(41) *
IS OFF-LINE CON-
DITION PRESENT?
NO
YES
WAS THERE A
DATA ERROR ?
I NO
REAL LIVE
DEADLY ERROR !
*CKLOOP *
RING
A
DING
HANG AWAITING
TRANSITION
NO
ARE WE GETTING
A TRANSITION TO
ON-LINE ?
I YES
*CKSTRT *
YES
WERE WE
ATTEMPTING PACK
MODE ?
I NO
NO
WERE WE ATTEMPT-
ING IMAGE MODE?
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)


*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 ?
NO
YES
* HANG AWAITING CONTROLLER READY *
ISSUE A POWER CLEAR
IS STATUS REGISTER NOW ALL CLEARED OUT ?
NO
YES
REPORT ERROR
*RETURN TO WHERE ROUTINE "INIT" WAS LAST CALLED *

CD11/CD20 CARD READER DIAGNOSTIC
FLOW CHART CROSS REFERENCE LIST

CD11/CD20 CARD READER DIAGNOSTIC
FLOW CHART CROSS REFERENCE LIST

	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		

CD11/CD20 CARD READER DIAGNOSTIC
FLOW CHART CROSS REFERENCE LIST

07

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                        .MCALL  .EQUAT,.SETUP,.$TYPOCT,.$TYPE,.$TRAP,.$POWER,GETPRI
                        .MCALL  NEWTST,.$SCOPE,.$EOP,.$ACT11,.$TYPDEC,COMMENT,ENDCOMMENT

176000                  $SWR=176000

                        .TITLE  MAINDEC - 11 - DZCDB-B
                        ;*COPYRIGHT (C) 1977
                        ;*DIGITAL EQUIPMENT CORP.
                        ;*MAYNARD, MASS. 01754
                        ;*
                        ;*PROGRAM BY E. RYAN
                        ;*
                        ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
                        ;*PACKAGE (MAINDEC-11-DZQAC-B1),AUG 29,1975.
                        ;*
000001                  $TN=1

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                        .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
```

```
000004                  BIT02=  4
000002                  BIT01=  2
000001                  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
000004                  ERRVEC= 4               ;;TIME OUT AND OTHER ERRORS
000010                  RESVEC= 10              ;;RESERVED AND ILLEGAL INSTRUCTIONS
000014                  TBITVEC=14              ;;"T" BIT
000014                  TRTVEC= 14              ;;TRACE TRAP
000014                  BPTVEC= 14              ;;BREAKPOINT TRAP (BPT)
000020                  IOTVEC= 20              ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
000024                  PWRVEC= 24              ;;POWER FAIL
000030                  EMTVEC= 30              ;;EMULATOR TRAP (EMT) **ERROR**
000034                  TRAPVEC=34              ;;"TRAP" TRAP
000060                  TKVEC=  60              ;;TTY KEYBOARD VECTOR
000064                  TPVEC=  64              ;;TTY PRINTER VECTOR
000240                  PIRQVEC=240             ;;PROGRAM INTERRUPT REQUEST VECTOR

                        ;SPECIAL EQUATES
000000                          DUMMY=  0
000002                          ADINT=  %2              ;CONTAINS ADDRESS OF INTERRUPT VECTOR
000003                          CDS=    %3              ;CONTAINS ADDRESS OF CARD READER STATUS REGISTER
000004                          CDC=    %4              ;CONTAINS ADDRESS OF CARD READER COLUMN COUNT
000005                          CDA=    %5              ;CONTAINS ADDRESS OF CARD READER BUS ADDRESS REG.
000005                          TTY=    %5
000360                          TRACE=  360


                        .SBTTL  TRAP CATCHER

000000                          .=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
000174                          .=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  015046                          $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  015642                  JMP     ERCD11                  ;FOR CD11 (M1000/M200) ERROR FUNCTION TESTS

000220                                  .=220
000220  000137  024100                  JMP     TESTX                   ;FOR LOOP WHICH WILL CONTINUTALLY RUN
                                                                        ;ANY SINGLE SUBTEST

000240                                  .=240
000240  000137  024624                  JMP     CKSAME                  ;TO READ A SINGLE DATA PATTERN
                                                                        ;CONTINUOUSLY

000250                                  .=250
000250  000137  015342                  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 $ITEMB. THIS NUMBER INDICATES WHICH ITEM IN THE TABLE IS PERTINENT.
                        ;*NOTE1:        IF $ITEMB IS 0 THE ONLY PERTINENT DATA IS ($ERRPC).
                        ;*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  $ERRTB:

                        ;ITEM 1

                                EM1             ;STATUS REGISTER (CDS) BIT07 NOT SET BY
                                                ;INITIALIZATION PULSE
                                DH1             ; (PC)   (SP)   (CDS)   (CDD)   (PS)
                                DT1             ;$ERRPC,$REG6,$TMP0,$TMP1,$REG7
001276  000000                  0               ;OCTAL VALUES

                        ;ITEM 2

                                EM2             ;COLUMN COUNT REGISTER (CDC) NOT CLEARED BY
                                                ;INITIALIZATION PULSE
                                DH2             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (PS)
                                DT2             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$REG7
001306  000000                  0               ;OCTAL VALUES
```

```
                                ;ITEM 3
001310  036470                          EM3             ;BUS ADDRESS REGISTER (CDA) NOT CLEARED BY
                                                        ;INITIALIZATION PULSE
001312  044400                          DH3             ; (PC)   (SP)   (CDS)   (CDD)   (CDA)    (PS)
001314  045270                          DT3             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP3,$REG7
001316  000000                          0               ;OCTAL VALUES

                                ;ITEM 4

001320  036570                          EM4             ;STATUS REGISTER CONTENTS INCORRECT
001322  044254                          DH1             ; (PC)   (SP)   (CDS)   (CDD)    (PS)
001324  045236                          DT1             ;$ERRPC,$REG6,$TMP0,$TMP1,$REG7
001326  000000                          0               ;OCTAL VALUES

                                ;ITEM 5

001330  036633                          EM5             ;COLUMN COUNT REGISTER (CDC) NOT ABLE TO
                                                        ;BE LOADED WITH ALL ONE'S
001332  044322                          DH2             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)    (PS)
001334  045252                          DT2             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$REG7
001336  000000                          0               ;OCTAL VALUES

                                ;ITEM 6

001340  036734                          EM6             ;COLUMN COUNT REGISTER (CDC) NOT CLEARED
                                                        ;BY POWER CLEAR
001342  044322                          DH2             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)    (PS)
001344  045252                          DT2             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$REG7
001346  000000                          0               ;OCTAL VALUES

                                ;ITEM 7

001350  037024                          EM7             ;BUS ADDRESS REGISTER (CDA) NOT ABLE TO BE
                                                        ;LOADED WITH ALL ONE'S
001352  044400                          DH3             ; (PC)   (SP)   (CDS)   (CDD)   (CDA)    (PS)
001354  045270                          DT3             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP3,$REG7
001356  000000                          0               ;OCTAL VALUES

                                ;ITEM 10

001360  037124                          EM10            ;BUS ADDRESS REGISTER (CDA) NOT CLEARED
                                                        ;BY POWER CLEAR
001362  044400                          DH3             ; (PC)   (SP)   (CDS)   (CDD)   (CDA)    (PS)
001364  045270                          DT3             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP3,$REG7
001366  000000                          0               ;OCTAL VALUES

                                ;ITEM 11

001370  037213                          EM11            ;CONTROLLER READY DIDN'T CLEAR ON
                                                        ;READING A CARD
001372  044254                          DH1             ; (PC)   (SP)   (CDS)   (CDD)    (PS)
001374  045236                          DT1             ;$ERRPC,$REG6,$TMP0,$TMP1,$REG7
```

```
001376  000000                          0                       ;OCTAL VALUES

                                ;ITEM 12

001400  037275                          EM12                    ;CONTROLLER READY DIDN'T CLEAR BIT00
                                                                ;OF STATUS REGISTER (CDS)
001402  044254                          DH1                     ; (PC)   (SP)   (CDS)   (CDD)    (PS)
001404  045236                          DT1                     ;$ERRPC,$REG6,$TMP0,$TMP1,$REG7
001406  000000                          0                       ;OCTAL VALUES

                                ;ITEM 13

001410  037374                          EM13                    ;CONTROLLER DIDN'T SET WITHIN ONE SECOND
001412  044254                          DH1                     ; (PC)   (SP)   (CDS)   (CDD)    (PS)
001414  045236                          DT1                     ;$ERRPC,$REG6,$TMP0,$TMP1,$REG7
001416  000000                          0                       ;OCTAL VALUES

                                ;ITEM 14

001420  037443                          EM14                    ;ERROR (BIT15) SET IN STATUS REGISTER (CDS)
001422  044254                          DH1                     ; (PC)   (SP)   (CDS)   (CDD)    (PS)
001424  045236                          DT1                     ;$ERRPC,$REG6,$TMP0,$TMP1,$REG7
001426  000000                          0                       ;OCTAL VALUES

                                ;ITEM 15

001430  037516                          EM15                    ;BIT/S SET IN STATUS REGISTER (CDS) THAT
                                                                ;SHOULDN'T BE
001432  044254                          DH1                     ; (PC)   (SP)   (CDS)   (CDD)    (PS)
001434  045236                          DT1                     ;$ERRPC,$REG6,$TMP0,$TMP1,$REG7
001436  000000                          0                       ;OCTAL VALUES

                                ;ITEM 16

001440  037613                          EM16                    ;'BUSY' SET IN STATUS REGISTER (CDS)
                                                                ;SHOULDN'T BE
001442  044254                          DH1                     ; (PC)   (SP)   (CDS)   (CDD)    (PS)
001444  045236                          DT1                     ;$ERRPC,$REG6,$TMP0,$TMP1,$REG7
001446  000000                          0                       ;OCTAL VALUES

                                ;ITEM 17

001450  037677                          EM17                    ;RESTORING CPU STATUS AFTER READING A CARD
                                                                ;CLEARED CONTROLLER READY IN STATUS REGISTER
001452  044254                          DH1                     ; (PC)   (SP)   (CDS)   (CDD)    (PS)
001454  045236                          DT1                     ;$ERRPC,$REG6,$TMP0,$TMP1,$REG7
001456  000000                          0                       ;OCTAL VALUES

                                ;ITEM 20

001460  040026                          EM20                    ;NO INTERRUPT OCCURRED
001462  044456                          DH4                     ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001464  045306                          DT4                     ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001466  000000                          0                       ;OCTAL VALUES
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                                ;ITEM 21

001470  040054                          EM21            ;AN INTERRUPT OCCURRED - SHOULDN'T HAVE
001472  044456                          DH4             ;  (PC)    (SP)    (CDS)    (CDD)    (CDC)    (CDA)    (PS)
001474  045306                          DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001476  000000                          0               ;OCTAL VALUES

                                ;ITEM 22

001500  040124                          EM22            ;INTERRUPT ALREADY OCCURRED AT A HIGHER LEVEL
001502  044456                          DH4             ;  (PC)    (SP)    (CDS)    (CDD)    (CDC)    (CDA)    (PS)
001504  045306                          DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001506  000000                          0               ;OCTAL VALUES

                                ;ITEM 23

001510  040201                          EM23            ;CONTROLLER READY NOT SET
001512  044456                          DH4             ;  (PC)    (SP)    (CDS)    (CDD)    (CDC)    (CDA)    (PS)
001514  045306                          DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001516  000000                          0               ;OCTAL VALUES

                                ;ITEM 24

001520  040232                          EM24            ;INTERRUPT ALREADY OCCURRED AT A LOWER LEVEL
001522  044456                          DH4             ;  (PC)    (SP)    (CDS)    (CDD)    (CDC)    (CDA)    (PS)
001524  045306                          DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001526  000000                          0               ;OCTAL VALUES

                                ;ITEM 25

001530  040306                          EM25            ;AN INTERRUPT OCCURRED AT TWO DIFFERENT LEVELS
001532  044456                          DH4             ;  (PC)    (SP)    (CDS)    (CDD)    (CDC)    (CDA)    (PS)
001534  045306                          DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001536  000000                          0               ;OCTAL VALUES

                                ;ITEM 26

001540  040364                          EM26            ;ERROR (BIT15) NOT SET IN STATUS REGISTER
                                                        ;(CDS) - SHOULD BE
001542  044456                          DH4             ;  (PC)    (SP)    (CDS)    (CDD)    (CDC)    (CDA)    (PS)
001544  045306                          DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001546  000000                          0               ;OCTAL VALUES

                                ;ITEM 27

001550  040461                          EM27            ;NON-EXISTANT MEMORY (BIT09) NOT SET IN
                                                        ;STATUS REGISTER (CDS) - SHOULD BE
001552  044456                          DH4             ;  (PC)    (SP)    (CDS)    (CDD)    (CDC)    (CDA)    (PS)
001554  045306                          DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001556  000000                          0               ;OCTAL VALUES

                                ;ITEM 30
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                                EM30            ;EXTENDED MEMORY (BIT05) NOT SET IN STATUS
                                                ;REGISTER(CDS)
                                DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)   (PS)
                                DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
                                0               ;OCTAL VALUES

                            ;ITEM 31

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

                            ;ITEM 32

                                EM15            ;
                                DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)   (PS)
                                DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
                                0               ;OCTAL VALUES

                            ;ITEM 33

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

                            ;ITEM 34

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

                            ;ITEM 35

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

                            ;ITEM 36

                                EM35            ;NO TRANSITION TO ON-LINE (BIT03) OCCURRED
                                                ;IN STATUS REGISTER (CDS)
                                DH1             ; (PC)   (SP)   (CDS)   (CDD)   (PS)
                                DT1             ;$ERRPC,$REG6,$TMP0,$TMP1,$REG7
                                0               ;OCTAL VALUES
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                                ;ITEM 37

001650  043627                          EM63            ;DISASTEROUS ERROR BUT NO ERROR BITS SET
001652  044456                          DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001654  045306                          DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001656  000000                          0               ;OCTAL VALUES

                                ;ITEM 40

001660  041353                          EM36            ;CONTENTS OF STATUS REGISTER #2 (CDD)
                                                        ;INCORRECT
001662  045114                          DH7             ; (PC)   (SP)   (CDS)   (CDD)   (CDD)    (PS)
                                                        ;                       WAS     SHB
001664  045350                          DT6             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP4,$REG7
001666  000000                          0               ;OCTAL VALUES

                                ;ITEM 41

001670  041432                          EM37            ;NO INTERRUPT WITH PROCESSOR AT LEVEL 0
001672  044456                          DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001674  045306                          DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001676  000000                          0               ;OCTAL VALUES

                                ;ITEM 42

001700  041501                          EM40            ;DATA LATE (BIT10) NOT SET IN STATUS
                                                        ;REGISTER (CDS)
001702  044456                          DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001704  045306                          DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001706  000000                          0               ;OCTAL VALUES

                                ;ITEM 43

001710  041564                          EM41            ;OFF-LINE (BIT12) NOT SET IN STATUS
                                                        ;REGISTER (CDS)
001712  044456                          DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001714  045306                          DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001716  000000                          0               ;OCTAL VALUES

                                ;ITEM 44

001720  041646                          EM42            ;OFF-LINE (BIT12) SET IN STATUS REGISTER
                                                        ;(CDS) - SHOULDN'T BE
001722  044456                          DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001724  045306                          DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001726  000000                          0               ;OCTAL VALUES

                                ;ITEM 45

001730  041743                          EM43            ;PICK CHECK (BIT13) NOT SET IN STATUS
                                                        ;REGISTER #2 (CDD)
001732  044456                          DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001734  045306                          DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
```

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001736  000000                  0                       ;OCTAL VALUES

                        ;ITEM 46

001740  042032                  EM44                    ;STACK CHECK (BIT12) NOT SET IN STATUS
                                                        ;REGISTER #2 (CDD)
001742  044456                  DH4                     ;  (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001744  045306                  DT4                     ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001746  000000                  0                       ;OCTAL VALUES

                        ;ITEM 47

001750  042122                  EM45                    ;END OF FILE (BIT13) SET IN STATUS
                                                        ;REGISTER (CDS) - SHOULDN'T BE
001752  044456                  DH4                     ;  (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001754  045306                  DT4                     ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001756  000000                  0                       ;OCTAL VALUES

                        ;ITEM 50

001760  042230                  EM46                    ;READ CHECK (BIT14) SET IN STATUS
                                                        ;REGISTER (CDS) - SHOULDN'T BE
001762  044456                  DH4                     ;  (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001764  045306                  DT4                     ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001766  000000                  0                       ;OCTAL VALUES

                        ;ITEM 51

001770  042335                  EM47                    ;HOPPER CHECK (BIT02) SET IN STATUS
                                                        ;REGISTER (CDS) - SHOULDN'T BE
001772  044456                  DH4                     ;  (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
001774  045306                  DT4                     ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
001776  000000                  0                       ;OCTAL VALUES

                        ;ITEM 52

002000  042444                  EM50                    ;END OF FILE (BIT13) OF STATUS REGISTER
                                                        ;(CDS) NOT SET - SHOULD BE
002002  044456                  DH4                     ;  (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
002004  045306                  DT4                     ;$ERRPC,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
002006  000000                  0                       ;OCTAL VALUES

                        ;ITEM 53

002010  042552                  EM51                    ;READ CHECK (BIT14) OF STATUS REGISTER
                                                        ;(CDS) NOT SET- SHOULD BE
002012  044456                  DH4                     ;  (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
002014  045306                  DT4                     ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
002016  000000                  0                       ;OCTAL VALUES

                        ;ITEM 54

002020  042657                  EM52                    ;HOPPER CHECK (BIT12) OF STATUS REGISTER
                                                        ;CDS) NOT SET - SHOULD BE
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002022  044456                  DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
002024  045306                  DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
002026  000000                  0               ;OCTAL VALUES

                        ;ITEM 55

002030  042766                  EM53            ;END OF FILE (BIT13) OF STATUS REGISTER
                                                ;(CDS) DIDN'T CLEAR WITH TRANSITION
                                                ;TO ON-LINE
002032  044456                  DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
002034  045306                  DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
002036  000000                  0               ;OCTAL VALUES

                        ;ITEM 56

002040  043115                  EM54            ;READ CHECK (BIT14) NOT SET IN STATUS
                                                ;REGISTER #2 (CDD)
002042  044456                  DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
002044  045306                  DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3.$REG7
002046  000000                  0               ;OCTAL VALUES

                        ;ITEM 57

002050  043204                  EM55            ;CARD READER ERROR BUT NO BOTH CARD
002052  044456                  DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
002054  045306                  DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
002056  000000                  0               ;OCTAL VALUES

                        ;ITEM 60

002060  043250                  EM56            ;CARD READER ERROR BUT READER NOT OFF-LINE
002062  044456                  DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
002064  045306                  DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
002066  000000                  0               ;OCTAL VALUES

                        ;ITEM 61

002070  043313                  EM57            ;END OF FILE ERROR (BIT13) OF STATUS
                                                ;REGISTER (CDS)
002072  044456                  DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
002074  045306                  DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
002076  000000                  0               ;OCTAL VALUES

                        ;ITEM 62

002100  043376                  EM60            ;DATA ERROR (BIT11) OF STATUS REGISTER (CDS)
002102  044456                  DH4             ; (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
002104  045306                  DT4             ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
002106  000000                  0               ;OCTAL VALUES

                        ;ITEM 63

002110  043452                  EM61            ;DATA LATE ERROR (BIT10) OF STATUS
                                                ;REGISTER (CDS)
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                                        DH4                     ;  (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
                                        DT4                     ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
                                        0                       ;OCTAL VALUES

                                ;ITEM 64

                                        EM62                    ;NON-EXISTANT MEMORY ERROR (BIT09) OF
                                                                ;STATUS REGISTER (CDS)
                                        DH4                     ;  (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
                                        DT4                     ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
                                        0                       ;OCTAL VALUES

                                ;ITEM 65

                                        EM64                    ;DATA PACKING (BIT01) OF STATUS REGISTER
                                                                ;(CDS) NOT SET - IT SHOULD BE
                                        DH4                     ;  (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
                                        DT4                     ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
                                        0                       ;OCTAL VALUES

                                ;ITEM 66

                                        EM65                    ;SHOULD BE ADDRESSING BINARY DECK -
                                                                ;PROGRAM DOESN'T AGREE
                                        DH4                     ;  (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
                                        DT4                     ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
                                        0                       ;OCTAL VALUES

                                ;ITEM 67

                                        EM66                    ;CONTENTS OF STATUS REGISTER (CDS)
                                                                ;INCORRECT - SHOULD BE ZERO
                                        DH1                     ;  (PC)   (SP)   (CDS)   (CDD)    (PS)
                                        DT1                     ;$ERRPC,$REG6,$TMP0,$TMP1,$REG7
                                        0                       ;OCTAL VALUES

                                ;ITEM 70

                                        EM67                    ;ODD BUS ADDRESS CAUSED A TRAP IN
                                                                ;NON-PACK MODE
                                        DH4                     ;  (PC)   (SP)   (CDS)   (CDD)   (CDC)   (CDA)    (PS)
                                        DT4                     ;$ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7
                                        0                       ;OCTAL VALUES
```

```
                                        BEGIN:
002170                                          MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
002170  012706  001100                          CLR     (R6)+           ;;CLEAR MEMORY LOCATION
002174  005026                                  CMP     #$BDDAT,R6      ;;DONE?
002176  022706  001126                          BNE     .-6             ;;LOOP BACK IF NO
002202  001374                                  MOV     #STACK,SP       ;;SETUP THE STACK POINTER
002204  012706  001100                          MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
002210  012737  026326  000020                  MOV     #340,@#IOTVEC+2 ;;LEVEL 7
002216  012737  000340  000022                  MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
002224  012737  026152  000030                  MOV     #340,@#EMTVEC+2 ;;LEVEL 7
002232  012737  000340  000032                  MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
002240  012737  027374  000034                  MOV     #340,@#TRAPVEC+2;LEVEL 7
002246  012737  000340  000036                  MOV     #$PWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
002254  012737  027430  000024                  MOV     #340,@#PWRVEC+2 ;;LEVEL 7
002262  012737  000340  000026                  MOV     $ENDCT,$EOPCT   ;;SETUP END-OF-PROGRAM COUNTER
002270  013737  014774  014766                  CLR     $TIMES          ;;INITIALIZE NUMBER OF ITERATIONS
002276  005037  001220                          MOV     #$RTRN,@#TBITVEC ;;SET "T" BIT VECTOR TO $RTRN
002302  012737  015140  000014                  MOV     #340,@#TBITVEC+2 ;;LEVEL 7
002310  012737  000340  000016                  MOV     #RTI,$RTRN      ;;SET $RTRN TO A RTI
002316  012737  000002  015140                  MOV     #65$,@#RESVEC   ;;TRY TO DO A RTT
002324  012737  002352  000010                  CLR     -(SP)           ;;DUMMY PS
002332  005046                                  MOV     #64$,-(SP)      ;;AND PC
002334  012746  002342                          RTT                     ;;TRY THE RTT
002340  000006                                  MOV     #RTT,$RTRN      ;;RTT IS LEGAL--SET $RTRN TO A RTT
002342  012737  000006  015140  64$:            BR      66$             ;;RTT ILLEGAL--CLEAN OFF THE STACK
002350  000402                          65$:    ADD     #10,SP          ;;RESTORE TRAP CATCHER
002352  062706  000010                  66$:    MOV     #RESVEC+2,@#RESVEC ;;CLEAR "T" BIT SWITCH
002356  012737  000012  000010                  CLR     $TBIT           ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
002364  005037  015146                          MOV     #.,$LPADR       ;;SAVE ERROR VECTOR
002370  012737  002370  001106                  MOV     @#4,-(SP)
002376  013746  000004                          MOV     @#6,-(SP)       ;;SET UP TIME OUT VECTOR
002402  013746  000006                          MOV     #67$,4          ;;TRY TO REFERENCE HARDWARE SWR
002406  012737  002422  000004                  TST     @SWR            ;;BRANCH IF NO TIMEOUT TRAP OCCURS
002414  005777  176516                          BR      68$             ;;POINT TO SOFTWARE SWR
002420  000407                          67$:    MOV     #SWREG,SWR      ;;POINT TO SOFTWARE DISPLAY REG
002422  012737  000176  001136                  MOV     #DISPREG,DISPLAY ;;RESTORE STACK
002430  012737  000174  001140                  CMP     (SP)+,(SP)+     ;;RESTORE ERROR VECTOR
002436  022626                          68$:    MOV     (SP)+,@#6
002440  012637  000006                          MOV     (SP)+,@#4
002444  012637  000004                          MOV     #BEGIN,RETURN           ;SAVE RETURN POINT FOR THIS
002450  012737  002170  027576                                                  ;SECTION FOR POWER FAILURE RETURN

002456  004737  045366                  JSR     PC,     SETUP   ;INITIALIZE POINTERS AND FLAGS
002462  005737  000042                  TST     @#42            ;TEST FOR MONITOR
002466  001015                          BNE     HEADIN          ;BRANCH IF MONITOR IS IN CONTROL
002470  104400  030556                  TYPE,   STMES           ;TYPE MAINDEC TITLE & REV. LEVEL
002474  104400  030616                  TYPE,   STADDR          ;TYPE STARTING ADDRESSES MESSAGE
002500  104400  030550                  TYPE,   CRLF-3
002504  104400  035463                  TYPE,   MSG31           ;USER IS TO SET SR SWITCHES
002510  104400  031632                  TYPE,   MSG2            ;HIT CONTINUE
002514  000000                          HALT
002516  104400  030553                  TYPE,   CRLF
```

```
                                HEADIN: TYPE,   MLOGIC                  ;INDICATE "ENTERING LOGIC TESTS"
                                        TYPE,   $ENULL                  ;TIME TO FINISH ABOVE MESSAGE
                                        BR      TST1            ;GO TO INSTRUCTION TESTS
                                RESTRT: TST     TRFLG           ;CHECK FOR TRACE TRAPPING
                                        BNE     TRAPX           ;IF SET, TRACE TRAP
                                NOTRP:
                                        MOV     PR7,-(SP)       ;;PUT NEW PS ON STACK
                                        MOV     #64$,-(SP)      ;;PUT NEW PC ON  STACK
                                        RTI                     ;; POP NEW PC AND PS
                                64$:
                                        TYPE,   MLOGIC                  ;INDICATE "ENTERING LOGIC TESTS"
                                        TYPE,   $ENULL                  ;TIME TO FINISH ABOVE MESSAGE
                                        BR      TST1            ;GO TO INSTRUCTION TESTS
                                TRAPX:  TYPE,   MLOGIC          ;INDICATE "ENTERING LOGIC TESTS"
                                        TYPE,   $ENULL          ;TIME TO FINISH ABOVE MESSAGE
                                        BIT     #10000, @SWR    ;CHECK SW12
                                        BNE     NOTRP           ;BRANCH IF SET TO CLEAR TRACE BIT
                                        MOV     TRACE,-(SP)     ;;PUT NEW PS ON STACK
                                        MOV     #64$,-(SP)      ;;PUT NEW PC ON  STACK
                                        RTI                     ;; POP NEW PC AND PS
                                64$:

                                ;*****************************************************************
                                ;*TEST 1        TEST FOR INIT. OF ALL REGISTERS
                                ;*****************************************************************
                                TST1:   SCOPE
                                        JSR     PC,     CKOFFL  ;CHECK FOR OFF-LINE SET
                                        RESET                   ;SEND OUT INIT
                                        CMP     #200,   @CDS    ;CHECK FOR STATUS REGISTER BIT 7 SET
                                        BEQ     1$              ;BRANCH IF OK
                                        ERROR +1                        ;STATUS REGISTER NOT CORRECTLY INITIALIZED

                                1$:     TST     @CDC            ;CHECK FOR COLUMN COUNT CLEARED
                                        BEQ     2$              ;BR IF OK
                                        ERROR +2                        ;COLUMN COUNT NOT CLEARED BY INIT

                                2$:     TST     @CDA            ;CHECK FOR BUS ADDRESS CLEARED
                                        BEQ     3$              ;BR IF OK
                                        ERROR +3                        ;BUS ADDRESS NOT CLEARED BY INIT

                                3$:     TST     @CDDB                   ;TEST BIT15 OF STATUS REGISTER #2
                                        BPL     4$                      ;BRANCH IF NOT SET INDICATING
                                                                        ;OLD CD11 CONTROLLER
                                        CMP     #107777,@CDDB           ;IS CONTENTS OF STATUS REGISTER #2
                                                                        ;CORRECT FOR NO ERRORS?
                                        BEQ     5$                      ;BRANCH IF OK!
                                        MOV     #107777,$TMP4           ;CORRECT CONTENTS OF 'CDD' FOR
                                                                        ;ERROR REPORT
                                        ERROR +40                       ;CONTENTS OF 'CDDB' STATUS REGISTER
                                                                        ;#2 NOT = 107777
                                        BR      5$                      ;GO TO NEXT TEST
                                4$:     CMP     #007777,@CDDB           ;WE HAVE AN OLD CD11 CONTROLLER!
                                                                        ;IS CONTENTS OF STATUS REGISTER #2
                                                                        ;CORRECT FOR NO ERRORS?
```

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                002712  001404                  BEQ     5$                      ;BRANCH IF OK!
                002714  012737  007777  001210  MOV     #007777,$TMP4           ;CORRECT CONTENTS OF 'CDD' FOR
                                                                                ;ERROR REPORT
                002722  104040                  ERROR +40                       ;CONTENTS OF 'CDDB' STATUS REGISTER
                                                                                ;#2 NOT = 007777
                002724                  5$:
                                        ;*****************************************************************
                                        ;*TEST 2        TEST READ/WRITE OF STATUS REGISTER
                                        ;*****************************************************************
                002724  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
                002726  052713  177376          BIS     #177376,@CDS    ;SET ALL BITS BUT 0 AND 8
                002732  022713  000362          CMP     #362,   @CDS    ;ONLY BITS 1,4,5,6, AND 7 SHOULD BE SET
                002736  001402                  BEQ     1$              ;BRANCH IF OK
                002740  104004                  ERROR +4                        ;STATUS REGISTER DIDN'T CONTAIN 362
                002742  000413                  BR      TST3            ;BRANCH AFTER FAILURE

                                                ;CLEARING STATUS REGISTER SHOULD CLEAR BITS 1,4,5, AND 6
                002744  005013          1$:     CLR     @CDS            ;CLEAR BITS 1,4,5, AND 6
                002746  022713  000200          CMP     #200,   @CDS    ;CHECK FOR ALL BITS CLEAR BUT 7
                002752  001401                  BEQ     2$              ;BRANCH IF OK
                002754  104004                  ERROR +4                        ;STATUS REGISTER DIDN'T CONTAIN 200

                                                ;SETTING ALL BITS SHOULD DO A POWER CLEAR
                002756  012713  177777  2$:     MOV     #177777,@CDS    ;SET ALL BITS OF THE STATUS REGISTER
                002762  022713  000200          CMP     #200,   @CDS    ;CHECK FOR ALL BITS CLEAR BUT 7
                002766  001401                  BEQ     3$              ;BRANCH IF OK
                002770  104004                  ERROR +4                        ;STATUS REGISTER DIDN'T CONTAIN 200

                002772                  3$:
                                        ;*****************************************************************
                                        ;*TEST 3        TEST READ/WRITE OF COLUMN COUNT REGISTER
                                        ;*****************************************************************
                002772  000004          TST3:   SCOPE
                002774  012714  177777          MOV     #177777,@CDC    ;LOAD ALL BITS
                003000  022714  177777          CMP     #177777,@CDC    ;TEST TO SEE IF IT CAN BE READ
                003004  001401                  BEQ     1$              ;BRANCH IF OK
                003006  104005                  ERROR +5                        ;CDCC FAILED TO READ/WRITE

                003010  022713  000200  1$:     CMP     #200,   @CDS    ;CHECK STATUS REG
                003014  001401                  BEQ     2$              ;BRANCH IF OK
                003016  104004                  ERROR +4                        ;STATUS REG CHANGED

                003020  052713  000400  2$:     BIS     #400,   @CDS    ;DO A POWER CLEAR
                003024  005714                  TST     @CDC            ;CHECK FOR COLUMN COUNT CLEARED
                003026  001401                  BEQ     3$              ;BRANCH IF OK
                003030  104006                  ERROR +6                        ;COLUMN COUNT NOT CLEARED BY POWER CLEAR

                003032  022713  000200  3$:     CMP     #200,   @CDS    ;CHECK STATUS REG
                003036  001401                  BEQ     4$              ;BRANCH IF OK
                003040  104004                  ERROR +4                        ;STATUS REG CHANGED

                003042                  4$:
```

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                        ;*****************************************************************
                        ;*TEST 4        TEST READ/WRITE OF BUS ADDRESS REGISTER
                        ;*****************************************************************
003042  000004          TST4:   SCOPE
003044  012715  177777          MOV     #177777,@CDA    ;LOAD ALL BITS
003050  022715  177777          CMP     #177777,@CDA    ;TEST TO SEE IF IT CAN BE READ
003054  001401                  BEQ     1$              ;BRANCH IF OK
003056  104007                  ERROR +7                        ;CDBA FAILED TO READ/WRITE

003060  022713  000200  1$:     CMP     #200,   @CDS    ;CHECK STATUS REG
003064  001401                  BEQ     2$              ;BRANCH IF OK
003066  104004                  ERROR +4                        ;STATUS REG CHANGED

003070  052713  000400  2$:     BIS     #400,   @CDS    ;DO A POWER CLEAR
003074  005715                  TST     @CDA            ;CHECK FOR BUS ADDRESS CLEARED
003076  001401                  BEQ     3$              ;BRANCH IF OK
003100  104010                  ERROR +10                       ;BUS ADDRESS NOT CLEARED BY POWER CLEAR

003102  022713  000200  3$:     CMP     #200,   @CDS    ;CHECK STATUS REG
003106  001401                  BEQ     4$              ;BRANCH IF OK
003110  104004                  ERROR +4                        ;STATUS REG CHANGED

003112                  4$:
                        ;*****************************************************************
                        ;*TEST 5        TEST CONTROLLER READY TO CLEAR BIT0
                        ;*****************************************************************
003112  000004          TST5:   SCOPE
                        ;BIT 0 SHOULD ALWAYS READ AS BEING EQUAL TO ZERO
003114  004737  025772          JSR     PC,     CKOFFL  ;CHECK FOR OFF-LINE SET
003120  012714  177777          MOV     #-1,    @CDC    ;SET UP COLUMN COUNT TO READ 1 COLUMN
003124  012715  045442          MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,PROC"
003130  005046                  CLR     -(SP)           ;;
003132  013746  000034          MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
003136  012737  003146  000034  MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
003144  104400                  TRAP                    ;;PUSH OLD PSW AN PCON STACK
003146  016666  000002  000006  64$:    MOV     2(SP),6(SP)     ;;
003154  012716  003162          MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
003160  000002                  RTI                     ;;RESTORE PSW
003162  012637  000034  65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
003166  012637  001256          MOV     (SP)+,PROC
003172  013746  000000          MOV     PRO,-(SP)       ;;PUT NEW PS ON STACK
003176  012746  003204          MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
003202  000002                  RTI                     ;; POP NEW PC AND PS
003204                  66$:
003204  005037  001250          CLR     COUNT           ;INITIALIZE COUNTER
003210  005213                  INC     @CDS            ;START READING A CARD
003212  105713                  TSTB    @CDS            ;CHECK FOR CONTROLLER READY CLEARED
003214  100001                  BPL     LOOP5           ;BRANCH IF OK
003216  104011                  ERROR +11                       ;CONTROLLER READY DIDN'T CLEAR

003220  032713  000001  LOOP5:  BIT     #1,     @CDS    ;CHECK BIT 0
003224  001402                  BEQ     1$              ;BRANCH IF NOT SET
003226  104012                  ERROR +12                       ;BIT 0 READ AS A ONE
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1081  003230  000423                        BR      TST6            ;BRANCH AFTER FAILURE
1082  003232  005237  001250        1$:     INC     COUNT           ;WAIT ABOUT
1083  003236  001370                        BNE     LOOP5
1084  003240  013746  001256                MOV     PROC,-(SP)      ;;PUT NEW PS ON STACK
1085  003244  012746  003252                MOV     #64$,-(SP)      ;;PUT NEW PC ON  STACK
1086  003250  000002                        RTI                     ;; POP NEW PC AND PS
1087  003252                        64$:
1088  003252  105713                        TSTB    @CDS            ;CHECK CONTROLLER READY
1089  003254  100401                        BMI     2$              ;CONTINUE IF  SET
1090  003256  104013                        ERROR +13                       ;CONTROLLER READY DIDN'T SET WITHIN 1 SEC
1091  003260  005713                2$:     TST     @CDS
1092  003262  100002                        BPL     3$
1093  003264  104014                        ERROR +14                       ;ERROR BIT SET
1094  003266  000404                        BR      TST6
1095  003270  032713  177577        3$:     BIT     #177577,@CDS    ;CHECK FOR ANY OTHER BITS
1096  003274  001401                        BEQ     4$              ;BRANCH IF OK
1097  003276  104015                        ERROR +15                       ;EXTRA BIT(S) SET
1098
1099  003300                        4$:
1100                                ;*****************************************************************
1101                                ;*TEST 6        TEST BIT2 TO BE CLEAR AFTER CARD READ
1102                                ;*****************************************************************
1103  003300  000004                TST6:   SCOPE
1104                                ;IT SHOULD REMAIN NOT SET
1105                                ;THIS SHOULD HAPPEN WITHIN ABOUT 1 SECOND
1106  003302  004737  025772                JSR     PC,CKOFFL       ;CHECK FOR OFF-LINE SET
1107  003306  005013                        CLR     @CDS            ;INITIALIZE STATUS REGISTER
1108  003310  012714  177754                MOV     #-20.,  @CDC    ;SET UP COLUMN COUNT TO READ 20 COLUMNS
1109  003314  012715  045442                MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
1110  003320  005213                        INC     @CDS            ;READ A CARD
1111  003322  032713  000004                BIT     #4,@CDS         ;CHECK HOPPER EMPTY
1112  003326  001401                        BEQ     1$
1113  003330  104016                        ERROR +16                       ;HOPPER EMPTY SET
1114  003332  005037  001250        1$:     CLR     COUNT           ;SET UP WAIT COUNTER
1115                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,PROC"
1116  003336  005046                        CLR     -(SP)           ;;
1117  003340  013746  000034                MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1118  003344  012737  003354  000034        MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
1119  003352  104400                        TRAP                    ;;PUSH OLD PSW AN PCON STACK
1120  003354  016666  000002  000006 64$:   MOV     2(SP),6(SP)     ;;
1121  003362  012716  003370                MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
1122  003366  000002                        RTI                     ;;RESTORE PSW
1123  003370  012637  000034        65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1124  003374  012637  001256                MOV     (SP)+,PROC
1125  003400  013746  000000                MOV     PRO,-(SP)       ;;PUT NEW PS ON STACK
1126  003404  012746  003412                MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
1127  003410  000002                        RTI                     ;; POP NEW PC AND PS
1128  003412                        66$:
1129  003412  105713                LOOP6A: TSTB    @CDS            ;CHECK READY
1130  003414  100405                        BMI     LOOP6B          ;BRANCH IF READY
1131  003416  005337  001250                DEC     COUNT           ;WAIT ABOUT 1 SEC.
1132  003422  001373                        BNE     LOOP6A
1133  003424  104013                        ERROR +13                       ;READING A CARD DIDN'T SET READY
1134  003426  000413                        BR      TST7
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1135  003430                          LOOP6B:
1136  003430  013746  001256                  MOV     PROC,-(SP)      ;;PUT NEW PS ON STACK
1137  003434  012746  003442                  MOV     #64$,-(SP)      ;;PUT NEW PC ON  STACK
1138  003440  000002                          RTI                     ;; POP NEW PC AND PS
1139  003442                          64$:
1140  003442  105713                  LOOP6:  TSTB    @CDS            ;CHECK CONTROLLER READY
1141  003444  100401                          BMI     DONE6           ;BRANCH IF SET
1142  003446  104017                          ERROR +17                       ;RESTORING STATUS RESET READY
1143
1144  003450  005713                  DONE6:  TST     @CDS            ;CHECK ERROR BIT 15
1145  003452  100001                          BPL     1$              ;BRANCH IF OK
1146  003454  104014                          ERROR +14                       ;ERROR BIT 15 WAS SET
1147
1148  003456                          1$:
1149                                  ;*****************************************************************
1150                                  ;*TEST 7        TEST INTERRUPT FROM CONTROLLER READY
1151                                  ;*****************************************************************
1152  003456  000004                  TST7:   SCOPE
1153  003460  004737  025744                  JSR     PC,     INIT    ;INITIALIZE
1154  003464  012712  003740                  MOV     #TINT7,@ADINT   ;LOAD RETURN POINTER
1155                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
1156  003470  005046                          CLR     -(SP)           ;;
1157  003472  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1158  003476  012737  003506  000034          MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
1159  003504  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
1160  003506  016666  000002  000006  64$:    MOV     2(SP),6(SP)     ;;
1161  003514  012716  003522                  MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
1162  003520  000002                          RTI                     ;;RESTORE PSW
1163  003522  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1164  003526  012637  001214                  MOV     (SP)+,$TMP6
1165  003532  052737  000340  001214          BIS     #340,$TMP6
1166  003540  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1167  003544  012746  003552                  MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
1168  003550  000002                          RTI                     ;; POP NEW PC AND PS
1169  003552                          66$:
1170                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
1171  003552  005046                          CLR     -(SP)           ;;
1172  003554  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1173  003560  012737  003570  000034          MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
1174  003566  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
1175  003570  016666  000002  000006  67$:    MOV     2(SP),6(SP)     ;;
1176  003576  012716  003604                  MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
1177  003602  000002                          RTI                     ;;RESTORE PSW
1178  003604  012637  000034          68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1179  003610  012662  000002                  MOV     (SP)+,2(ADINT)
1180                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
1181  003614  005046                          CLR     -(SP)           ;;
1182  003616  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1183  003622  012737  003632  000034          MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
1184  003630  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
1185  003632  016666  000002  000006  69$:    MOV     2(SP),6(SP)     ;;
1186  003640  012716  003646                  MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
1187  003644  000002                          RTI                     ;;RESTORE PSW
1188  003646  012637  000034          70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
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1189  003652  012637  001214                MOV     (SP)+,$TMP6
1190  003656  042737  000340  001214        BIC     #340,$TMP6
1191  003664  013746  001214                MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1192  003670  012746  003676                MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
1193  003674  000002                        RTI                     ;; POP NEW PC AND PS
1194  003676                        71$:
1195  003676  012714  177741                MOV     #-31.,  @CDC    ;SET UP COLUMN COUNT TO READ 31 COLUMNS
1196  003702  012715  045442                MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
1197  003706  012713  000101                MOV     #101,   @CDS    ;SET INTERRUPT ENABLE AND READ
1198  003712  105713                1$:     TSTB    @CDS            ;WAIT FOR CONTROLLER READY
1199  003714  100376                        BPL     1$
1200                                        ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV 2(ADINT),PS"
1201  003716  016246  000002                MOV     2(ADINT),-(SP)  ;;PUT NEW PS ON STACK
1202  003722  012746  003730                MOV     #72$,-(SP)      ;;PUT NEW PC ON  STACK
1203  003726  000002                        RTI                     ;; POP NEW PC AND PS
1204  003730                        72$:
1205  003730  042713  000100                BIC     #100,   @CDS    ;CLEAR INTERRUPT ENABLE
1206  003734  104020                        ERROR +20                       ;NO INTERRUPT OCCURRED
1207  003736  000410                        BR      CONT7
1208  003740  105713                TINT7:  TSTB    @CDS            ;CHECK CONTROLLER READY
1209  003742  100401                        BMI     1$              ;BRANCH IF SET
1210  003744  104023                        ERROR +23                       ;CONTROLLER READY NOT SET
1211  003746  022626                1$:     CMP     (SP)+,  (SP)+   ;RESTORE STACK POINTER
1212  003750  005713                        TST     @CDS            ;MAKE SURE NO ERROR OCCURRED
1213  003752  100001                        BPL     2$
1214  003754  104014                        ERROR +14                       ;BIT 15 WAS SET
1215  003756  005013                2$:     CLR     @CDS            ;DISABLE INTERRUPTS
1216  003760  012712  000232        CONT7:  MOV     #232,@ADINT     ;CHANGE INTERRUPT RETURN ADDRESS
1217  003764  005037  000232                CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1218
1219                                ;*****************************************************************
1220                                ;*TEST 10       TEST NO INTERRUPT ON CONTROLLER READY & CPU AT LEVEL 7
1221                                ;*****************************************************************
1222  003770  000004                TST10:  SCOPE
1223  003772  004737  025744                JSR     PC,     INIT    ;INITIALIZE
1224  003776  012712  004150                MOV     #TINT10,@ADINT  ;SETUP RETURN
1225                                        ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
1226  004002  005046                        CLR     -(SP)           ;;
1227  004004  013746  000034                MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1228  004010  012737  004020  000034        MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
1229  004016  104400                        TRAP                    ;;PUSH OLD PSW AN PCON STACK
1230  004020  016666  000002  000006  64$:  MOV     2(SP),6(SP)     ;;
1231  004026  012716  004034                MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
1232  004032  000002                        RTI                     ;;RESTORE PSW
1233  004034  012637  000034        65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1234  004040  012637  001214                MOV     (SP)+,$TMP6
1235  004044  052737  000340  001214        BIS     #340,$TMP6
1236  004052  013746  001214                MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1237  004056  012746  004064                MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
1238  004062  000002                        RTI                     ;; POP NEW PC AND PS
1239  004064                        66$:
1240                                        ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
1241  004064  005046                        CLR     -(SP)           ;;
1242  004066  013746  000034                MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
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1243  004072  012737  004102  000034          MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
1244  004100  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
1245  004102  016666  000002  000006  67$:    MOV     2(SP),6(SP)     ;;
1246  004110  012716  004116                  MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
1247  004114  000002                          RTI                     ;;RESTORE PSW
1248  004116  012637  000034          68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1249  004122  012662  000002                  MOV     (SP)+,2(ADINT)
1250  004126  012714  177703                  MOV     #-61.,  @CDC    ;SET UP COLUMN COUNT TO READ 61 COLUMNS
1251  004132  012715  045442                  MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
1252  004136  012713  000101                  MOV     #101,   @CDS    ;SET INTERRUPT ENABLE AND READ
1253  004142  105713                  1$:     TSTB    @CDS            ;WAIT FOR CONTROLLER READY
1254  004144  100376                          BPL     1$
1255  004146  000402                          BR      T10GO           ;CONTINUE IF NO INTERRUPT OCCURRED
1256  004150  104021                  TINT10: ERROR +21                       ;AN INTERRUPT OCCURRED
1257  004152  022626                          CMP     (SP)+,(SP)+     ;RESTORE STACK POINTER
1258  004154  005013                  T10GO:  CLR     @CDS            ;CLEAR INTERRUPT ENABLE
1259  004156  012712  000232                  MOV     #232,@ADINT     ;CHANGE INTERRUPT RETURN ADDRESS
1260  004162  005037  000232                  CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1261
1262                                  ;FIND THE LEVEL AT WHICH AN INTERRUPT OCCURS
1263                                  ;PRINT OUT A MESSAGE STATING THIS LEVEL IF IT IS OTHER THAN THE STANDARD
1264                                  ;(LEVEL 6) MAKE CERTAIN THAT IT ALWAYS OCCURS AT THIS LEVEL
1265                                  ;THE MESSAGE STATING THE LEVEL IS PRINTED ONLY ONCE, AND THE PROGRAM MUST
1266                                  ;BE STARTED OVER AT LOCATION 200 FOR IT TO BE PRINTED AGAIN
1267
1268                                  ;*****************************************************************
1269                                  ;*TEST 11       TEST FOR AN INTERRUPT ON LEVEL 7
1270                                  ;*****************************************************************
1271  004166  000004                  TST11:  SCOPE
1272  004170  004737  025744                  JSR     PC,     INIT    ;INITIALIZE
1273  004174  012712  004556                  MOV     #TINT11,@ADINT  ;SETUP RETURN ADDRESS
1274                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
1275  004200  005046                  CLR     -(SP)           ;;
1276  004202  013746  000034          MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1277  004206  012737  004216  000034  MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
1278  004214  104400                  TRAP                    ;;PUSH OLD PSW AN PCON STACK
1279  004216  016666  000002  000006  64$:    MOV     2(SP),6(SP)     ;;
1280  004224  012716  004232                  MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
1281  004230  000002                          RTI                     ;;RESTORE PSW
1282  004232  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1283  004236  012637  001214                  MOV     (SP)+,$TMP6
1284  004242  052737  000340  001214          BIS     #340,$TMP6
1285  004250  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1286  004254  012746  004262                  MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
1287  004260  000002                          RTI                     ;; POP NEW PC AND PS
1288  004262                          66$:
1289                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
1290  004262  005046                  CLR     -(SP)           ;;
1291  004264  013746  000034          MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1292  004270  012737  004300  000034  MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
1293  004276  104400                  TRAP                    ;;PUSH OLD PSW AN PCON STACK
1294  004300  016666  000002  000006  67$:    MOV     2(SP),6(SP)     ;;
1295  004306  012716  004314                  MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
1296  004312  000002                          RTI                     ;;RESTORE PSW
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 1297  004314  012637  000034          68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
 1298  004320  012662  000002                  MOV     (SP)+,2(ADINT)
 1299                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
 1300  004324  005046                          CLR     -(SP)           ;;
 1301  004326  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
 1302  004332  012737  004342  000034          MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
 1303  004340  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
 1304  004342  016666  000002  000006  69$:    MOV     2(SP),6(SP)     ;;
 1305  004350  012716  004356                  MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
 1306  004354  000002                          RTI                     ;;RESTORE PSW
 1307  004356  012637  000034          70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
 1308  004362  012637  001214                  MOV     (SP)+,$TMP6
 1309  004366  042737  000340  001214          BIC     #340,$TMP6
 1310  004374  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
 1311  004400  012746  004406                  MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
 1312  004404  000002                          RTI                     ;; POP NEW PC AND PS
 1313  004406                          71$:
 1314  004406  005046                          CLR     -(SP)           ;;
 1315  004410  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
 1316  004414  012737  004424  000034          MOV     #72$,34         ;;SETUP NEW TRAP VECTOT
 1317  004422  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
 1318  004424  016666  000002  000006  72$:    MOV     2(SP),6(SP)     ;;
 1319  004432  012716  004440                  MOV     #73$,(SP)               ;;REPLACE OLD PC WITH NEW
 1320  004436  000002                          RTI                     ;;RESTORE PSW
 1321  004440  012637  000034          73$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
 1322  004444  012637  001214                  MOV     (SP)+,$TMP6
 1323  004450  052737  000300  001214          BIS     #300,$TMP6
 1324  004456  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
 1325  004462  012746  004470                  MOV     #74$,-(SP)      ;;PUT NEW PC ON  STACK
 1326  004466  000002                          RTI                     ;; POP NEW PC AND PS
 1327  004470                          74$:
 1328  004470  012714  177660                  MOV     #-80.,  @CDC    ;SET UP COLUMN COUNT TO READ 80 COLUMNS
 1329  004474  012715  045442                  MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
 1330  004500  012713  000101                  MOV     #101,   @CDS    ;SET INTERRUPT ENABLE AND READ
 1331  004504  105713                  1$:     TSTB    @CDS            ;WAIT FOR CONTROLLER READY
 1332  004506  100376                          BPL     1$
 1333                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV 2(ADINT),PS"
 1334  004510  016246  000002                  MOV     2(ADINT),-(SP)  ;;PUT NEW PS ON STACK
 1335  004514  012746  004522                  MOV     #75$,-(SP)      ;;PUT NEW PC ON  STACK
 1336  004520  000002                          RTI                     ;; POP NEW PC AND PS
 1337  004522                          75$:
 1338  004522  005013                          CLR     @CDS            ;DISABLE INTERRUPTS
 1339  004524  012712  000232                  MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
 1340  004530  005037  000232                  CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
 1341  004534  005737  001252                  TST     INTFLG          ;TEST FOR A PREVIOUS INTERRUPT
 1342  004540  001441                          BEQ     TST12           ;BRANCH IF NONE
 1343  004542  023727  001252  100007          CMP     INTFLG, #100007 ;CHECK PREVIOUS LEVEL
 1344  004550  100435                          BMI     TST12           ;BRANCH IF LOWER
 1345  004552  104022                          ERROR +22                       ;INTERRUPT ALREADY OCCURRED AT LVL 7 OR HIGHER
 1346  004554  000433                          BR      TST12
 1347  004556  105713                  TINT11: TSTB    @CDS            ;MAKE SURE CONTROLLER READY IS SET
 1348  004560  100401                          BMI     1$              ;BRANCH IF SET
 1349  004562  104023                          ERROR +23                       ;CONTROLLER READY WASN'T SET
 1350  004564  005013                  1$:     CLR     @CDS            ;DISABLE FURTHER INTERRUPTS
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1351  004566  012712  000232                  MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
1352  004572  005037  000232                  CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1353  004576  022626                          CMP     (SP)+,  (SP)+   ;RESTORE STACK POINTER
1354  004600  005737  001252                  TST     INTFLG          ;CHECK FOR PREVIOUS FLAG
1355  004604  100412                          BMI     SET7            ;BRANCH IF FLAG SET
1356  004606  012737  100007  001252          MOV     #100007,INTFLG ;SET FLAG AND LEVEL
1357  004614  104400  031741                  TYPE,   MSG4            ;PRINT MESSAGE "THE INTERRUPT LEVEL WAS"
1358  004620  012746  000007                  MOV     #7,-(SP)
1359  004624  104402                          TYPOS
1360  004626     001                          .BYTE   1
1361  004627     000                          .BYTE   0
1362  004630  000405                          BR      TST12
1363  004632  023727  001252  100007  SET7: CMP     INTFLG, #100007 ;CHECK PREVIOUS LEVEL
1364  004640  100001                          BPL     TST12
1365  004642  104024                          ERROR +24                       ;INTERRUPT ALREADY OCCURRED AT A LOWER LEVEL
1366                                  ;*****************************************************************
1367                                  ;*TEST 12       TEST FOR AN INTERRUPT ON LEVEL 6
1368                                  ;*****************************************************************
1369  004644  000004                  TST12:  SCOPE
1370  004646  004737  025744                  JSR     PC,     INIT    ;INITIALIZE
1371  004652  012712  005234                  MOV     #TINT12,@ADINT  ;SETUP RETURN ADDRESS
1372                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
1373  004656  005046                          CLR     -(SP)           ;;
1374  004660  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1375  004664  012737  004674  000034          MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
1376  004672  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
1377  004674  016666  000002  000006  64$:    MOV     2(SP),6(SP)     ;;
1378  004702  012716  004710                  MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
1379  004706  000002                          RTI                     ;;RESTORE PSW
1380  004710  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1381  004714  012637  001214                  MOV     (SP)+,$TMP6
1382  004720  052737  000340  001214          BIS     #340,$TMP6
1383  004726  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1384  004732  012746  004740                  MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
1385  004736  000002                          RTI                     ;; POP NEW PC AND PS
1386  004740                          66$:
1387                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
1388  004740  005046                          CLR     -(SP)           ;;
1389  004742  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1390  004746  012737  004756  000034          MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
1391  004754  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
1392  004756  016666  000002  000006  67$:    MOV     2(SP),6(SP)     ;;
1393  004764  012716  004772                  MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
1394  004770  000002                          RTI                     ;;RESTORE PSW
1395  004772  012637  000034          68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1396  004776  012662  000002                  MOV     (SP)+,2(ADINT)
1397                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
1398  005002  005046                          CLR     -(SP)           ;;
1399  005004  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1400  005010  012737  005020  000034          MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
1401  005016  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
1402  005020  016666  000002  000006  69$:    MOV     2(SP),6(SP)     ;;
1403  005026  012716  005034                  MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
1404  005032  000002                          RTI                     ;;RESTORE PSW
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1405  005034  012637  000034          70$:  MOV     (SP)+,34              ;;RESTORE OLD TRAP  VECTOR
1406  005040  012637  001214                MOV     (SP)+,$TMP6
1407  005044  042737  000340  001214        BIC     #340,$TMP6
1408  005052  013746  001214                MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1409  005056  012746  005064                MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
1410  005062  000002                        RTI                     ;; POP NEW PC AND PS
1411  005064                          71$:
1412  005064  005046                        CLR     -(SP)           ;;
1413  005066  013746  000034                MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1414  005072  012737  005102  000034        MOV     #72$,34         ;;SETUP NEW TRAP VECTOT
1415  005100  104400                        TRAP                    ;;PUSH OLD PSW AN PCON STACK
1416  005102  016666  000002  000006  72$:  MOV     2(SP),6(SP)     ;;
1417  005110  012716  005116                MOV     #73$,(SP)               ;;REPLACE OLD PC WITH NEW
1418  005114  000002                        RTI                     ;;RESTORE PSW
1419  005116  012637  000034          73$:  MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1420  005122  012637  001214                MOV     (SP)+,$TMP6
1421  005126  052737  000240  001214        BIS     #240,$TMP6
1422  005134  013746  001214                MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1423  005140  012746  005146                MOV     #74$,-(SP)      ;;PUT NEW PC ON  STACK
1424  005144  000002                        RTI                     ;; POP NEW PC AND PS
1425  005146                          74$:
1426  005146  012714  177660                MOV     #-80.,  @CDC    ;SET UP COLUMN COUNT TO READ 80 COLUMNS
1427  005152  012715  045442                MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
1428  005156  012713  000101                MOV     #101,   @CDS    ;SET INTERRUPT ENABLE AND READ
1429  005162  105713                  1$:   TSTB    @CDS            ;WAIT FOR CONTROLLER READY
1430  005164  100376                        BPL     1$
1431                                        ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV 2(ADINT),PS"
1432  005166  016246  000002                MOV     2(ADINT),-(SP)  ;;PUT NEW PS ON STACK
1433  005172  012746  005200                MOV     #75$,-(SP)      ;;PUT NEW PC ON  STACK
1434  005176  000002                        RTI                     ;; POP NEW PC AND PS
1435  005200                          75$:
1436  005200  005013                        CLR     @CDS            ;DISABLE INTERRUPTS
1437  005202  012712  000232                MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
1438  005206  005037  000232                CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1439  005212  005737  001252                TST     INTFLG          ;TEST FOR A PREVIOUS INTERRUPT
1440  005216  001441                        BEQ     TST13           ;BRANCH IF NONE
1441  005220  023727  001252  100006        CMP     INTFLG, #100006 ;CHECK PREVIOUS LEVEL
1442  005226  100435                        BMI     TST13           ;BRANCH IF LOWER
1443  005230  104022                        ERROR +22                       ;INTERRUPT ALREADY OCCURRED AT LVL 6 OR HIGHER
1444  005232  000433                        BR      TST13
1445  005234  105713                TINT12: TSTB    @CDS            ;MAKE SURE CONTROLLER READY IS SET
1446  005236  100401                        BMI     1$              ;BRANCH IF SET
1447  005240  104023                        ERROR +23                       ;CONTROLLER READY WASN'T SET
1448  005242  005013                  1$:   CLR     @CDS            ;DISABLE FURTHER INTERRUPTS
1449  005244  012712  000232                MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
1450  005250  005037  000232                CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1451  005254  022626                        CMP     (SP)+,  (SP)+   ;RESTORE STACK POINTER
1452  005256  005737  001252                TST     INTFLG          ;CHECK FOR PREVIOUS FLAG
1453  005262  100412                        BMI     SET6            ;BRANCH IF FLAG SET
1454  005264  012737  100006  001252        MOV     #100006,INTFLG  ;SET FLAG AND LEVEL
1455  005272  104400  031741                TYPE,   MSG4            ;PRINT MESSAGE "THE INTERRUPT LEVEL WAS"
1456  005276  012746  000006                MOV     #6,-(SP)
1457  005302  104402                        TYPOS
1458  005304     001                        .BYTE   1
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1459  005305  000                        .BYTE   0
1460  005306  000405                     BR      TST13
1461  005310  023727  001252  100006  SET6: CMP     INTFLG, #100006 ;CHECK PREVIOUS LEVEL
1462  005316  100001                     BPL     TST13
1463  005320  104024                     ERROR +24                       ;INTERRUPT ALREADY OCCURRED AT A LOWER LEVEL
1464                                  ;*****************************************************************
1465                                  ;*TEST 13       TEST FOR AN INTERRUPT ON LEVEL 5
1466                                  ;*****************************************************************
1467  005322  000004                 TST13:  SCOPE
1468  005324  004737  025744                 JSR     PC,     INIT    ;INITIALIZE
1469  005330  012712  005712                 MOV     #TINT13,@ADINT  ;SETUP RETURN ADDRESS
1470                                        ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
1471  005334  005046                       CLR     -(SP)                   ;;
1472  005336  013746  000034               MOV     34,-(SP)                ;;SAVE CURRENT TRAP VECTOR
1473  005342  012737  005352  000034       MOV     #64$,34                 ;;SETUP NEW TRAP VECTOT
1474  005350  104400                       TRAP                            ;;PUSH OLD PSW AN PCON STACK
1475  005352  016666  000002  000006  64$:  MOV     2(SP),6(SP)             ;;
1476  005360  012716  005366               MOV     #65$,(SP)                       ;;REPLACE OLD PC WITH NEW
1477  005364  000002                       RTI                             ;;RESTORE PSW
1478  005366  012637  000034         65$:  MOV     (SP)+,34                        ;;RESTORE OLD TRAP  VECTOR
1479  005372  012637  001214               MOV     (SP)+,$TMP6
1480  005376  052737  000340  001214       BIS     #340,$TMP6
1481  005404  013746  001214               MOV     $TMP6,-(SP)             ;;PUT NEW PS ON STACK
1482  005410  012746  005416               MOV     #66$,-(SP)              ;;PUT NEW PC ON  STACK
1483  005414  000002                       RTI                             ;; POP NEW PC AND PS
1484  005416                         66$:
1485                                      ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
1486  005416  005046                       CLR     -(SP)                   ;;
1487  005420  013746  000034               MOV     34,-(SP)                ;;SAVE CURRENT TRAP VECTOR
1488  005424  012737  005434  000034       MOV     #67$,34                 ;;SETUP NEW TRAP VECTOT
1489  005432  104400                       TRAP                            ;;PUSH OLD PSW AN PCON STACK
1490  005434  016666  000002  000006  67$:  MOV     2(SP),6(SP)             ;;
1491  005442  012716  005450               MOV     #68$,(SP)                       ;;REPLACE OLD PC WITH NEW
1492  005446  000002                       RTI                             ;;RESTORE PSW
1493  005450  012637  000034         68$:  MOV     (SP)+,34                        ;;RESTORE OLD TRAP  VECTOR
1494  005454  012662  000002               MOV     (SP)+,2(ADINT)
1495                                      ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
1496  005460  005046                       CLR     -(SP)                   ;;
1497  005462  013746  000034               MOV     34,-(SP)                ;;SAVE CURRENT TRAP VECTOR
1498  005466  012737  005476  000034       MOV     #69$,34                 ;;SETUP NEW TRAP VECTOT
1499  005474  104400                       TRAP                            ;;PUSH OLD PSW AN PCON STACK
1500  005476  016666  000002  000006  69$:  MOV     2(SP),6(SP)             ;;
1501  005504  012716  005512               MOV     #70$,(SP)                       ;;REPLACE OLD PC WITH NEW
1502  005510  000002                       RTI                             ;;RESTORE PSW
1503  005512  012637  000034         70$:  MOV     (SP)+,34                        ;;RESTORE OLD TRAP  VECTOR
1504  005516  012637  001214               MOV     (SP)+,$TMP6
1505  005522  042737  000340  001214       BIC     #340,$TMP6
1506  005530  013746  001214               MOV     $TMP6,-(SP)             ;;PUT NEW PS ON STACK
1507  005534  012746  005542               MOV     #71$,-(SP)              ;;PUT NEW PC ON  STACK
1508  005540  000002                       RTI                             ;; POP NEW PC AND PS
1509  005542                         71$:
1510  005542  005046                       CLR     -(SP)                   ;;
1511  005544  013746  000034               MOV     34,-(SP)                ;;SAVE CURRENT TRAP VECTOR
1512  005550  012737  005560  000034       MOV     #72$,34                 ;;SETUP NEW TRAP VECTOT
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                                        TRAP                            ;;PUSH OLD PSW AN PCON STACK
005556  104400
005560  016666  000002  000006  72$:    MOV     2(SP),6(SP)             ;;
005566  012716  005574                  MOV     #73$,(SP)                       ;;REPLACE OLD PC WITH NEW
005572  000002                          RTI                             ;;RESTORE PSW
005574  012637  000034          73$:    MOV     (SP)+,34                        ;;RESTORE OLD TRAP  VECTOR
005600  012637  001214                  MOV     (SP)+,$TMP6
005604  052737  000200  001214          BIS     #200,$TMP6
005612  013746  001214                  MOV     $TMP6,-(SP)             ;;PUT NEW PS ON STACK
005616  012746  005624                  MOV     #74$,-(SP)              ;;PUT NEW PC ON  STACK
005622  000002                          RTI                             ;; POP NEW PC AND PS
005624                          74$:
005624  012714  177660                  MOV     #-80.,  @CDC            ;SET UP COLUMN COUNT TO READ 80 COLUMNS
005630  012715  045442                  MOV     #BUFBEG,@CDA            ;SET UP BUS ADDRESS
005634  012713  000101                  MOV     #101,   @CDS            ;SET INTERRUPT ENABLE AND READ
005640  105713          1$:     TSTB    @CDS                            ;WAIT FOR CONTROLLER READY
005642  100376                  BPL     1$
                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV 2(ADINT),PS"
005644  016246  000002                  MOV     2(ADINT),-(SP)  ;;PUT NEW PS ON STACK
005650  012746  005656                  MOV     #75$,-(SP)              ;;PUT NEW PC ON  STACK
005654  000002                          RTI                             ;; POP NEW PC AND PS
005656                          75$:
005656  005013                  CLR     @CDS                    ;DISABLE INTERRUPTS
005660  012712  000232                  MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
005664  005037  000232                  CLR     @#232                   ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
005670  005737  001252                  TST     INTFLG                  ;TEST FOR A PREVIOUS INTERRUPT
005674  001441                  BEQ     TST14                   ;BRANCH IF NONE
005676  023727  001252  100005          CMP     INTFLG, #100005 ;CHECK PREVIOUS LEVEL
005704  100435                  BMI     TST14                   ;BRANCH IF LOWER
                                ERROR +22                               ;INTERRUPT ALREADY OCCURRED AT LVL 5 OR HIGHER
005706  104022
005710  000433                  BR      TST14
005712  105713          TINT13: TSTB    @CDS                    ;MAKE SURE CONTROLLER READY IS SET
005714  100401                  BMI     1$                      ;BRANCH IF SET
                                ERROR +23                               ;CONTROLLER READY WASN'T SET
005716  104023
005720  005013          1$:     CLR     @CDS                    ;DISABLE FURTHER INTERRUPTS
005722  012712  000232                  MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
005726  005037  000232                  CLR     @#232                   ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
005732  022626                  CMP     (SP)+,  (SP)+           ;RESTORE STACK POINTER
005734  005737  001252                  TST     INTFLG                  ;CHECK FOR PREVIOUS FLAG
005740  100412                  BMI     SET5                    ;BRANCH IF FLAG SET
005742  012737  100005  001252          MOV     #100005,INTFLG ;SET FLAG AND LEVEL
005750  104400  031741                  TYPE,   MSG4                    ;PRINT MESSAGE "THE INTERRUPT LEVEL WAS"
005754  012746  000005                  MOV     #5,-(SP)
005760  104402                  TYPOS
005762     001                  .BYTE   1
005763     000                  .BYTE   0
005764  000405                  BR      TST14
005766  023727  001252  100005  SET5: CMP       INTFLG, #100005 ;CHECK PREVIOUS LEVEL
005774  100001                  BPL     TST14
005776  104024                  ERROR +24                               ;INTERRUPT ALREADY OCCURRED AT A LOWER LEVEL
                                ;*********************************************************
                                ;*TEST 14       TEST FOR AN INTERRUPT ON LEVEL 4
                                ;*********************************************************
006000  000004          TST14:  SCOPE
006002  004737  025744          JSR     PC,     INIT    ;INITIALIZE
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1567  006006  012712  006370                        MOV     #TINT14,@ADINT  ;SETUP RETURN ADDRESS
1568                                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
1569  006012  005046                                CLR     -(SP)           ;;
1570  006014  013746  000034                        MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1571  006020  012737  006030  000034                MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
1572  006026  104400                                TRAP                    ;;PUSH OLD PSW AN PCON STACK
1573  006030  016666  000002  000006  64$:  MOV     2(SP),6(SP)     ;;
1574  006036  012716  006044                        MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
1575  006042  000002                                RTI                     ;;RESTORE PSW
1576  006044  012637  000034          65$:  MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1577  006050  012637  001214                        MOV     (SP)+,$TMP6
1578  006054  052737  000340  001214                BIS     #340,$TMP6
1579  006062  013746  001214                        MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1580  006066  012746  006074                        MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
1581  006072  000002                                RTI                     ;; POP NEW PC AND PS
1582  006074                           66$:
1583                                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
1584  006074  005046                                CLR     -(SP)           ;;
1585  006076  013746  000034                        MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1586  006102  012737  006112  000034                MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
1587  006110  104400                                TRAP                    ;;PUSH OLD PSW AN PCON STACK
1588  006112  016666  000002  000006  67$:  MOV     2(SP),6(SP)     ;;
1589  006120  012716  006126                        MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
1590  006124  000002                                RTI                     ;;RESTORE PSW
1591  006126  012637  000034          68$:  MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1592  006132  012662  000002                        MOV     (SP)+,2(ADINT)
1593                                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
1594  006136  005046                                CLR     -(SP)           ;;
1595  006140  013746  000034                        MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1596  006144  012737  006154  000034                MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
1597  006152  104400                                TRAP                    ;;PUSH OLD PSW AN PCON STACK
1598  006154  016666  000002  000006  69$:  MOV     2(SP),6(SP)     ;;
1599  006162  012716  006170                        MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
1600  006166  000002                                RTI                     ;;RESTORE PSW
1601  006170  012637  000034          70$:  MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1602  006174  012637  001214                        MOV     (SP)+,$TMP6
1603  006200  042737  000340  001214                BIC     #340,$TMP6
1604  006206  013746  001214                        MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1605  006212  012746  006220                        MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
1606  006216  000002                                RTI                     ;; POP NEW PC AND PS
1607  006220                           71$:
1608  006220  005046                                CLR     -(SP)           ;;
1609  006222  013746  000034                        MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1610  006226  012737  006236  000034                MOV     #72$,34         ;;SETUP NEW TRAP VECTOT
1611  006234  104400                                TRAP                    ;;PUSH OLD PSW AN PCON STACK
1612  006236  016666  000002  000006  72$:  MOV     2(SP),6(SP)     ;;
1613  006244  012716  006252                        MOV     #73$,(SP)               ;;REPLACE OLD PC WITH NEW
1614  006250  000002                                RTI                     ;;RESTORE PSW
1615  006252  012637  000034          73$:  MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1616  006256  012637  001214                        MOV     (SP)+,$TMP6
1617  006262  052737  000140  001214                BIS     #140,$TMP6
1618  006270  013746  001214                        MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1619  006274  012746  006302                        MOV     #74$,-(SP)      ;;PUT NEW PC ON  STACK
1620  006300  000002                                RTI                     ;; POP NEW PC AND PS
```

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1621  006302                          74$:
1622  006302  012714  177660                  MOV     #-80.,  @CDC    ;SET UP COLUMN COUNT TO READ 80 COLUMNS
1623  006306  012715  045442                  MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
1624  006312  012713  000101                  MOV     #101,   @CDS    ;SET INTERRUPT ENABLE AND READ
1625  006316  105713                  1$:     TSTB    @CDS            ;WAIT FOR CONTROLLER READY
1626  006320  100376                          BPL     1$
1627                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV 2(ADINT),PS"
1628  006322  016246  000002                  MOV     2(ADINT),-(SP)  ;;PUT NEW PS ON STACK
1629  006326  012746  006334                  MOV     #75$,-(SP)      ;;PUT NEW PC ON  STACK
1630  006332  000002                          RTI                     ;; POP NEW PC AND PS
1631  006334                          75$:
1632  006334  005013                          CLR     @CDS            ;DISABLE INTERRUPTS
1633  006336  012712  000232                  MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
1634  006342  005037  000232                  CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1635  006346  005737  001252                  TST     INTFLG          ;TEST FOR A PREVIOUS INTERRUPT
1636  006352  001433                          BEQ     TST15           ;BRANCH IF NONE
1637  006354  023727  001252  100004          CMP     INTFLG, #100004 ;CHECK PREVIOUS LEVEL
1638  006362  100427                          BMI     TST15           ;BRANCH IF LOWER
1639  006364  104022                          ERROR +22                       ;INTERRUPT ALREADY OCCURRED AT LVL 4 OR HIGHER
1640  006366  000425                          BR      TST15
1641  006370  105713                  TINT14: TSTB    @CDS            ;MAKE SURE CONTROLLER READY IS SET
1642  006372  100401                          BMI     1$              ;BRANCH IF SET
1643  006374  104023                          ERROR +23                       ;CONTROLLER READY WASN'T SET
1644  006376  005013                  1$:     CLR     @CDS            ;DISABLE FURTHER INTERRUPTS
1645  006400  012712  000232                  MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
1646  006404  005037  000232                  CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1647  006410  022626                          CMP     (SP)+,  (SP)+   ;RESTORE STACK POINTER
1648  006412  005737  001252                  TST     INTFLG          ;CHECK FOR PREVIOUS FLAG
1649  006416  100404                          BMI     SET4            ;BRANCH IF FLAG SET
1650  006420  012737  100004  001252          MOV     #100004,INTFLG  ;SET FLAG AND LEVEL
1651  006426  000405                          BR      TST15
1652  006430  023727  001252  100004  SET4:  CMP     INTFLG, #100004 ;CHECK PREVIOUS LEVEL
1653  006436  100001                          BPL     TST15
1654  006440  104024                          ERROR +24                       ;INTERRUPT ALREADY OCCURRED AT A LOWER LEVEL
1655                                  ;*****************************************************************
1656                                  ;*TEST 15       TEST FOR AN INTERRUPT ON LEVEL 3
1657                                  ;*****************************************************************
1658  006442  000004                  TST15:  SCOPE
1659  006444  004737  025744                  JSR     PC,     INIT    ;INITIALIZE
1660  006450  012712  007032                  MOV     #TINT15,@ADINT  ;SETUP RETURN ADDRESS
1661                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
1662  006454  005046                          CLR     -(SP)           ;;
1663  006456  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1664  006462  012737  006472  000034          MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
1665  006470  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
1666  006472  016666  000002  000006  64$:    MOV     2(SP),6(SP)     ;;
1667  006500  012716  006506                  MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
1668  006504  000002                          RTI                     ;;RESTORE PSW
1669  006506  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1670  006512  012637  001214                  MOV     (SP)+,$TMP6
1671  006516  052737  000340  001214          BIS     #340,$TMP6
1672  006524  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1673  006530  012746  006536                  MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
1674  006534  000002                          RTI                     ;; POP NEW PC AND PS
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1675  006536                          66$:
1676                                      .THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
1677  006536  005046                    CLR     -(SP)           ;;
1678  006540  013746  000034            MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1679  006544  012737  006554  000034    MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
1680  006552  104400                    TRAP                    ;;PUSH OLD PSW AN PCON STACK
1681  006554  016666  000002  000006  67$:  MOV   2(SP),6(SP)   ;;
1682  006562  012716  006570            MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
1683  006566  000002                    RTI                     ;;RESTORE PSW
1684  006570  012637  000034          68$:  MOV   (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1685  006574  012662  000002            MOV     (SP)+,2(ADINT)
1686                                      .THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
1687  006600  005046                    CLR     -(SP)           ;;
1688  006602  013746  000034            MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1689  006606  012737  006616  000034    MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
1690  006614  104400                    TRAP                    ;;PUSH OLD PSW AN PCON STACK
1691  006616  016666  000002  000006  69$:  MOV   2(SP),6(SP)   ;;
1692  006624  012716  006632            MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
1693  006630  000002                    RTI                     ;;RESTORE PSW
1694  006632  012637  000034          70$:  MOV   (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1695  006636  012637  001214            MOV     (SP)+,$TMP6
1696  006642  042737  000340  001214    BIC     #340,$TMP6
1697  006650  013746  001214            MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1698  006654  012746  006662            MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
1699  006660  000002                    RTI                     ;; POP NEW PC AND PS
1700  006662                          71$:
1701  006662  005046                    CLR     -(SP)           ;;
1702  006664  013746  000034            MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1703  006670  012737  006700  000034    MOV     #72$,34         ;;SETUP NEW TRAP VECTOT
1704  006676  104400                    TRAP                    ;;PUSH OLD PSW AN PCON STACK
1705  006700  016666  000002  000006  72$:  MOV   2(SP),6(SP)   ;;
1706  006706  012716  006714            MOV     #73$,(SP)               ;;REPLACE OLD PC WITH NEW
1707  006712  000002                    RTI                     ;;RESTORE PSW
1708  006714  012637  000034          73$:  MOV   (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1709  006720  012637  001214            MOV     (SP)+,$TMP6
1710  006724  052737  000100  001214    BIS     #100,$TMP6
1711  006732  013746  001214            MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1712  006736  012746  006744            MOV     #74$,-(SP)      ;;PUT NEW PC ON  STACK
1713  006742  000002                    RTI                     ;; POP NEW PC AND PS
1714  006744                          74$:
1715  006744  012714  177660            MOV     #-80.,  @CDC    ;SET UP COLUMN COUNT TO READ 80 COLUMNS
1716  006750  012715  045442            MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
1717  006754  012713  000101            MOV     #101,   @CDS    ;SET INTERRUPT ENABLE AND READ
1718  006760  105713                  1$:  TSTB    @CDS            ;WAIT FOR CONTROLLER READY
1719  006762  100376                    BPL     1$
1720                                    ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV 2(ADINT),PS"
1721  006764  016246  000002            MOV     2(ADINT),-(SP)  ;;PUT NEW PS ON STACK
1722  006770  012746  006776            MOV     #75$,-(SP)      ;;PUT NEW PC ON  STACK
1723  006774  000002                    RTI                     ;; POP NEW PC AND PS
1724  006776                          75$:
1725  006776  005013                    CLR     @CDS            ;DISABLE INTERRUPTS
1726  007000  012712  000232            MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
1727  007004  005037  000232            CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1728  007010  005737  001252            TST     INTFLG          ;TEST FOR A PREVIOUS INTERRUPT
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1729  007014  001441                          BEQ     TST16           ;BRANCH IF NONE
1730  007016  023727  001252  100003          CMP     INTFLG, #100003 ;CHECK PREVIOUS LEVEL
1731  007024  100435                          BMI     TST16           ;BRANCH IF LOWER
1732  007026  104022                          ERROR +22                       ;INTERRUPT ALREADY OCCURRED AT LVL 3 OR HIGHER
1733  007030  000433                          BR      TST16
1734  007032  105713                  TINT15: TSTB    @CDS            ;MAKE SURE CONTROLLER READY IS SET
1735  007034  100401                          BMI     1$              ;BRANCH IF SET
1736  007036  104023                          ERROR +23                       ;CONTROLLER READY WASN'T SET
1737  007040  005013                  1$:     CLR     @CDS            ;DISABLE FURTHER INTERRUPTS
1738  007042  012712  000232                  MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
1739  007046  005037  000232                  CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1740  007052  022626                          CMP     (SP)+,  (SP)+   ;RESTORE STACK POINTER
1741  007054  005737  001252                  TST     INTFLG          ;CHECK FOR PREVIOUS FLAG
1742  007060  100412                          BMI     SET3            ;BRANCH IF FLAG SET
1743  007062  012737  100003  001252          MOV     #100003,INTFLG ;SET FLAG AND LEVEL
1744  007070  104400  031741                  TYPE,   MSG4            ;PRINT MESSAGE "THE INTERRUPT LEVEL WAS"
1745  007074  012746  000003                  MOV     #3,-(SP)
1746  007100  104402                          TYPOS
1747  007102     001                          .BYTE   1
1748  007103     000                          .BYTE   0
1749  007104  000405                          BR      TST16
1750  007106  023727  001252  100003  SET3: CMP     INTFLG, #100003 ;CHECK PREVIOUS LEVEL
1751  007114  100001                          BPL     TST16
1752  007116  104024                          ERROR +24                       ;INTERRUPT ALREADY OCCURRED AT A LOWER LEVEL
1753                                  ;*****************************************************************
1754                                  ;*TEST 16       TEST FOR AN INTERRUPT ON LEVEL 2
1755                                  ;*****************************************************************
1756  007120  000004                  TST16:  SCOPE
1757  007122  004737  025744                  JSR     PC,     INIT    ;INITIALIZE
1758  007126  012712  007510                  MOV     #TINT16,@ADINT  ;SETUP RETURN ADDRESS
1759                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
1760  007132  005046                          CLR     -(SP)           ;;
1761  007134  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1762  007140  012737  007150  000034          MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
1763  007146  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
1764  007150  016666  000002  000006  64$:    MOV     2(SP),6(SP)     ;;
1765  007156  012716  007164                  MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
1766  007162  000002                          RTI                     ;;RESTORE PSW
1767  007164  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1768  007170  012637  001214                  MOV     (SP)+,$TMP6
1769  007174  052737  000340  001214          BIS     #340,$TMP6
1770  007202  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1771  007206  012746  007214                  MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
1772  007212  000002                          RTI                     ;; POP NEW PC AND PS
1773  007214                          66$:
1774                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
1775  007214  005046                          CLR     -(SP)           ;;
1776  007216  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1777  007222  012737  007232  000034          MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
1778  007230  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
1779  007232  016666  000002  000006  67$:    MOV     2(SP),6(SP)     ;;
1780  007240  012716  007246                  MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
1781  007244  000002                          RTI                     ;;RESTORE PSW
1782  007246  012637  000034          68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
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1783  007252  012662  000002                        MOV     (SP)+,2(ADINT)
1784                                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
1785  007256  005046                                CLR     -(SP)           ;;
1786  007260  013746  000034                        MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1787  007264  012737  007274  000034                MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
1788  007272  104400                                TRAP                    ;;PUSH OLD PSW AN PCON STACK
1789  007274  016666  000002  000006  69$:         MOV     2(SP),6(SP)     ;;
1790  007302  012716  007310                        MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
1791  007306  000002                                RTI                     ;;RESTORE PSW
1792  007310  012637  000034          70$:         MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1793  007314  012637  001214                        MOV     (SP)+,$TMP6
1794  007320  042737  000340  001214                BIC     #340,$TMP6
1795  007326  013746  001214                        MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1796  007332  012746  007340                        MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
1797  007336  000002                                RTI                     ;; POP NEW PC AND PS
1798  007340                          71$:
1799  007340  005046                                CLR     -(SP)           ;;
1800  007342  013746  000034                        MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1801  007346  012737  007356  000034                MOV     #72$,34         ;;SETUP NEW TRAP VECTOT
1802  007354  104400                                TRAP                    ;;PUSH OLD PSW AN PCON STACK
1803  007356  016666  000002  000006  72$:         MOV     2(SP),6(SP)     ;;
1804  007364  012716  007372                        MOV     #73$,(SP)               ;;REPLACE OLD PC WITH NEW
1805  007370  000002                                RTI                     ;;RESTORE PSW
1806  007372  012637  000034          73$:         MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1807  007376  012637  001214                        MOV     (SP)+,$TMP6
1608  007402  052737  000040  001214                BIS     #040,$TMP6
1809  007410  013746  001214                        MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1810  007414  012746  007422                        MOV     #74$,-(SP)      ;;PUT NEW PC ON  STACK
1811  007420  000002                                RTI                     ;; POP NEW PC AND PS
1812  007422                          74$:
1813  007422  012714  177660                        MOV     #-80.,  @CDC    ;SET UP COLUMN COUNT TO READ 80 COLUMNS
1814  007426  012715  045442                        MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
1815  007432  012713  000101                        MOV     #101,   @CDS    ;SET INTERRUPT ENABLE AND READ
1816  007436  105713                  1$:          TSTB    @CDS            ;WAIT FOR CONTROLLER READY
1817  007440  100376                                BPL     1$
1818                                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV 2(ADINT),PS"
1819  007442  016246  000002                        MOV     2(ADINT),-(SP)  ;;PUT NEW PS ON STACK
1820  007446  012746  007454                        MOV     #75$,-(SP)      ;;PUT NEW PC ON  STACK
1821  007452  000002                                RTI                     ;; POP NEW PC AND PS
1822  007454                          75$:
1823  007454  005013                                CLR     @CDS            ;DISABLE INTERRUPTS
1824  007456  012712  000232                        MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
1825  007462  005037  000232                        CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1826  007466  005737  001252                        TST     INTFLG          ;TEST FOR A PREVIOUS INTERRUPT
1827  007472  001441                                BEQ     TST17           ;BRANCH IF NONE
1828  007474  023727  001252  100002                CMP     INTFLG, #100002 ;CHECK PREVIOUS LEVEL
1829  007502  100435                                BMI     TST17           ;BRANCH IF LOWER
1830  007504  104022                                ERROR +22                       ;INTERRUPT ALREADY OCCURRED AT LVL 2 OR HIGHER
1831  007506  000433                                BR      TST17
1832  007510  105713                  TINT16:      TSTB    @CDS            ;MAKE SURE CONTROLLER READY IS SET
1833  007512  100401                                BMI     1$              ;BRANCH IF SET
1834  007514  104023                                ERROR +23                       ;CONTROLLER READY WASN'T SET
1835  007516  005013                  1$:          CLR     @CDS            ;DISABLE FURTHER INTERRUPTS
1836  007520  012712  000232                        MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
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                                        CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
                                        CMP     (SP)+, (SP)+    ;RESTORE STACK POINTER
                                        TST     INTFLG          ;CHECK FOR PREVIOUS FLAG
                                        BMI     SET2            ;BRANCH IF FLAG SET
                                        MOV     #100002,INTFLG ;SET FLAG AND LEVEL
                                        TYPE,   MSG4            ;PRINT MESSAGE "THE INTERRUPT LEVEL WAS"
                                        MOV     #2,-(SP)
                                        TYPOS
                                        .BYTE   1
                                        .BYTE   0
                                        BR      TST17
                                SET2: CMP       INTFLG, #100002 ;CHECK PREVIOUS LEVEL
                                        BPL     TST17
                                        ERROR +24                       ;INTERRUPT ALREADY OCCURRED AT A LOWER LEVEL
                                ;*******************************************************************
                                ;*TEST 17        TEST FOR AN INTERRUPT ON LEVEL 1
                                ;*******************************************************************
                                TST17:  SCOPE
                                        JSR     PC,     INIT    ;INITIALIZE
                                        MOV     #TINT17,@ADINT  ;SETUP RETURN ADDRESS
                                        ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
                                        CLR     -(SP)           ;;
                                        MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
                                        MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
                                        TRAP                    ;;PUSH OLD PSW AN PCON STACK
                                64$:    MOV     2(SP),6(SP)     ;;
                                        MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
                                        RTI                     ;;RESTORE PSW
                                65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
                                        MOV     (SP)+,$TMP6
                                        BIS     #340,$TMP6
                                        MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
                                        MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
                                        RTI                     ;; POP NEW PC AND PS
                                66$:
                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
                                        CLR     -(SP)           ;;
                                        MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
                                        MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
                                        TRAP                    ;;PUSH OLD PSW AN PCON STACK
                                67$:    MOV     2(SP),6(SP)     ;;
                                        MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
                                        RTI                     ;;RESTORE PSW
                                68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
                                        MOV     (SP)+,2(ADINT)
                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
                                        CLR     -(SP)           ;;
                                        MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
                                        MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
                                        TRAP                    ;;PUSH OLD PSW AN PCON STACK
                                69$:    MOV     2(SP),6(SP)     ;;
                                        MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
                                        RTI                     ;;RESTORE PSW
                                70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
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1891  007772  012637  001214                    MOV     (SP)+,$TMP6
1892  007776  042737  000340  001214            BIC     #340,$TMP6
1893  010004  013746  001214                    MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1894  010010  012746  010016                    MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
1895  010014  000002                            RTI                     ;; POP NEW PC AND PS
1896  010016                          71$:
1897  010016  005046                            CLR     -(SP)           ;;
1898  010020  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
1899  010024  012737  010034  000034            MOV     #72$,34         ;;SETUP NEW TRAP VECTOT
1900  010032  104400                            TRAP                    ;;PUSH OLD PSW AN PCON STACK
1901  010034  016666  000002  000006  72$:      MOV     2(SP),6(SP)     ;;
1902  010042  012716  010050                    MOV     #73$,(SP)               ;;REPLACE OLD PC WITH NEW
1903  010046  000002                            RTI                     ;;RESTORE PSW
1904  010050  012637  000034            73$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
1905  010054  012637  001214                    MOV     (SP)+,$TMP6
1906  010060  052737  000000  001214            BIS     #000,$TMP6
1907  010066  013746  001214                    MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
1908  010072  012746  010100                    MOV     #74$,-(SP)      ;;PUT NEW PC ON  STACK
1909  010076  000002                            RTI                     ;; POP NEW PC AND PS
1910  010100                          74$:
1911  010100  012714  177660                    MOV     #-80.,  @CDC    ;SET UP COLUMN COUNT TO READ 80 COLUMNS
1912  010104  012715  045442                    MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
1913  010110  012713  000101                    MOV     #101,   @CDS    ;SET INTERRUPT ENABLE AND READ
1914  010114  105713                  1$:       TSTB    @CDS            ;WAIT FOR CONTROLLER READY
1915  010116  100376                            BPL     1$
1916                                            ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV 2(ADINT),PS"
1917  010120  016246  000002                    MOV     2(ADINT),-(SP)  ;;PUT NEW PS ON STACK
1918  010124  012746  010132                    MOV     #75$,-(SP)      ;;PUT NEW PC ON  STACK
1919  010130  000002                            RTI                     ;; POP NEW PC AND PS
1920  010132                          75$:
1921  010132  005013                            CLR     @CDS            ;DISABLE INTERRUPTS
1922  010134  012712  000232                    MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
1923  010140  005037  000232                    CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1924  010144  104041                            ERROR +41                       ;NO INTERRUPT WITH PROCESSOR AT LEVEL 0
1925  010146  000433                            BR      TST20
1926  010150  105713                  TINT17:   TSTB    @CDS            ;MAKE SURE CONTROLLER READY IS SET
1927  010152  100401                            BMI     1$              ;BRANCH IF SET
1928  010154  104023                            ERROR +23                       ;CONTROLLER READY WASN'T SET
1929  010156  005013                  1$:       CLR     @CDS            ;DISABLE FURTHER INTERRUPTS
1930  010160  012712  000232                    MOV     #232,   @ADINT  ;CHANGE INTERRUPT RETURN ADDRESS
1931  010164  005037  000232                    CLR     @#232           ;TO CAUSE A HALT IF AN INTERRUPT OCCURS
1932  010170  022626                            CMP     (SP)+,  (SP)+   ;RESTORE STACK POINTER
1933  010172  005737  001252                    TST     INTFLG          ;CHECK FOR PREVIOUS FLAG
1934  010176  100412                            BMI     SET1            ;BRANCH IF FLAG SET
1935  010200  012737  100001  001252            MOV     #100001,INTFLG  ;SET FLAG AND LEVEL
1936  010206  104400  031741                    TYPE,   MSG4            ;PRINT MESSAGE "THE INTERRUPT LEVEL WAS"
1937  010212  012746  000001                    MOV     #1,-(SP)
1938  010216  104402                            TYPOS
1939  010220     001                            .BYTE   1
1940  010221     000                            .BYTE   0
1941  010222  000405                            BR      TST20
1942  010224  023727  001252  100001  SET1:     CMP     INTFLG, #100001 ;CHECK PREVIOUS LEVEL
1943  010232  100001                            BPL     TST20
1944  010234  104024                            ERROR +24                       ;INTERRUPT ALREADY OCCURRED AT A LOWER LEVEL
```

```
                                ;*****************************************************************
                                ;*TEST 20       TEST NO INTERRUPT WITH IE SET & REST CLEARED
                                ;*****************************************************************
010236  000004          TST20:  SCOPE
010240  004737  025744          JSR     PC,     INIT    ;INITIALIZE CSR TO ZERO
010244  012712  010452          MOV     #TINT20,@ADINT  ;SETUP RETURN ADDRESS
                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
010250  005046                  CLR     -(SP)           ;;
010252  013746  000034          MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
010256  012737  010266  000034  MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
010264  104400                  TRAP                    ;;PUSH OLD PSW AN PCON STACK
010266  016666  000002  000006  64$:    MOV     2(SP),6(SP)     ;;
010274  012716  010302          MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
010300  000002                  RTI                     ;;RESTORE PSW
010302  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
010306  012637  001214          MOV     (SP)+,$TMP6
010312  052737  000340  001214  BIS     #340,$TMP6
010320  013746  001214          MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
010324  012746  010332          MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
010330  000002                  RTI                     ;; POP NEW PC AND PS
010332                          66$:
                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
010332  005046                  CLR     -(SP)           ;;
010334  013746  000034          MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
010340  012737  010350  000034  MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
010346  104400                  TRAP                    ;;PUSH OLD PSW AN PCON STACK
010350  016666  000002  000006  67$:    MOV     2(SP),6(SP)     ;;
010356  012716  010364          MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
010362  000002                  RTI                     ;;RESTORE PSW
010364  012637  000034          68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
010370  012662  000002          MOV     (SP)+,2(ADINT)
010374  013746  000000          MOV     PRO,-(SP)       ;;PUT NEW PS ON STACK
010400  012746  010406          MOV     #69$,-(SP)      ;;PUT NEW PC ON  STACK
010404  000002                  RTI                     ;; POP NEW PC AND PS
010406                          69$:
010406  012714  177777          MOV     #-1,    @CDC    ;SET UP COLUMN COUNT TO READ 1 COLUMN
010412  012715  045442          MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
010416  012713  000100          MOV     #100,   @CDS    ;ENABLE INTERRUPTS
010422  005037  001250          CLR     COUNT           ;INITIALIZE COUNTER
010426  005237  001250  1$:     INC     COUNT           ;WAIT AWHILE
010432  001375                  BNE     1$
                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV 2(ADINT),PS"
010434  016246  000002          MOV     2(ADINT),-(SP)  ;;PUT NEW PS ON STACK
010440  012746  010446          MOV     #70$,-(SP)      ;;PUT NEW PC ON  STACK
010444  000002                  RTI                     ;; POP NEW PC AND PS
010446                          70$:
010446  005013                  CLR     @CDS            ;DISABLE FURTHER INTERRUPTS
010450  000403                  BR      CONT20
010452  104021          TINT20: ERROR +21                       ;AN INTERRUPT OCCURRED
010454  022626                  CMP     (SP)+,  (SP)+   ;RESTORE STACK
010456  005013                  CLR     @CDS            ;DISABLE FURTHER INTERRUPTS
010460  005037  000232  CONT20: CLR     @#232           ;CHANGE INTERRUPT RETURN ADDRESS TO
010464  012712  000232          MOV     #232,   @ADINT  ;CAUSE A HALT IF AN INTERRUPT OCCURS
```

```
                                ;*****************************************************************
                                ;*TEST 21       SIMULTANEOUS INTERRUPTS AT MORE THAN 1 LEVEL
                                ;*****************************************************************
010470  000004                  TST21:  SCOPE
010472  004737  025744                  JSR     PC,     INIT    ;INITIALIZE CSR TO ZERO
010476  012712  010726                  MOV     #TINT21,@ADINT  ;SETUP RETURN ADDRESS
                                        ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
010502  005046                          CLR     -(SP)           ;;
010504  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
010510  012737  010520  000034          MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
010516  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
010520  016666  000002  000006  64$:    MOV     2(SP),6(SP)     ;;
010526  012716  010534                  MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
010532  000002                          RTI                     ;;RESTORE PSW
010534  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
010540  012637  001214                  MOV     (SP)+,$TMP6
010544  052737  000340  001214          BIS     #340,$TMP6
010552  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
010556  012746  010564                  MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
010562  000002                          RTI                     ;; POP NEW PC AND PS
010564                          66$:
                                        ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
010564  005046                          CLR     -(SP)           ;;
010566  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
010572  012737  010602  000034          MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
010600  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
010602  016666  000002  000006  67$:    MOV     2(SP),6(SP)     ;;
010610  012716  010616                  MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
010614  000002                          RTI                     ;;RESTORE PSW
010616  012637  000034          68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
010622  012662  000002                  MOV     (SP)+,2(ADINT)
                                        ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
010626  005046                          CLR     -(SP)           ;;
010630  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
010634  012737  010644  000034          MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
010642  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
010644  016666  000002  000006  69$:    MOV     2(SP),6(SP)     ;;
010652  012716  010660                  MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
010656  000002                          RTI                     ;;RESTORE PSW
010660  012637  000034          70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
010664  012637  001214                  MOV     (SP)+,$TMP6
010670  042737  000340  001214          BIC     #340,$TMP6
010676  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
010702  012746  010710                  MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
010706  000002                          RTI                     ;; POP NEW PC AND PS
010710                          71$:
010710  012714  177777                  MOV     #-1,    @CDC    ;SET UP COLUMN COUNT TO READ 1 COLUMN
010714  012715  045442                  MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
010720  012713  000101                  MOV     #101,   @CDS    ;SET INTERRUPT ENABLE AND READ
010724  000777                          BR      .               ;WAIT FOR INTERRUPT
010726  022626          TINT21: CMP     (SP)+,  (SP)+           ;RESTORE STACK POINTER
010730  012712  010764                  MOV     #TINA21,@ADINT  ;CHANGE RETRUN ADDRESS
010734  013746  000000                  MOV     PRO,-(SP)       ;;PUT NEW PS ON STACK
```

```
2053  010740  012746  010746                  MOV     #64$,-(SP)      ;;PUT NEW PC ON  STACK
2054  010744  000002                          RTI                     ;; POP NEW PC AND PS
2055  010746                          64$:
2056  010746  000240                          NOP                     ;WAIT
2057                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV 2(ADINT),PS"
2058  010750  016246  000002                  MOV     2(ADINT),-(SP)  ;;PUT NEW PS ON STACK
2059  010754  012746  010762                  MOV     #65$,-(SP)      ;;PUT NEW PC ON  STACK
2060  010760  000002                          RTI                     ;; POP NEW PC AND PS
2061  010762                          65$:
2062  010762  000402                          BR      CONT21
2063  010764  022626                  TINA21: CMP     (SP)+,  (SP)+   ;RESTORE STACK
2064  010766  104025                          ERROR +25                       ;THE INTERRUPT OCCURRED AT 2 LEVELS
2065  010770  005013                  CONT21: CLR     @CDS            ;DISABLE INTERRUPTS
2066  010772  005037  000232                  CLR     @#232           ;CHANGE INTERRUPT RETURN ADDRESS TO
2067  010776  012712  000232                  MOV     #232,   @ADINT  ;CAUSE A HALT IF AN INTERRUPT OCCURS
2068
2069                                          ;*****************************************************************
2070                                          ;*TEST 22       NON-EXISTANT MEMORY DETECTION
2071                                          ;*****************************************************************
2072  011002  000004                  TST22:  SCOPE
2073  011004  004737  025744                  JSR     PC,     INIT    ;INITIALIZE CSR TO ZERO
2074  011010  012712  011240                  MOV     #TINT22,@ADINT  ;SETUP RETURN ADDRESS
2075                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
2076  011014  005046                          CLR     -(SP)           ;;
2077  011016  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
2078  011022  012737  011032  000034          MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
2079  011030  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
2080  011032  016666  000002  000006  64$:    MOV     2(SP),6(SP)     ;;
2081  011040  012716  011046                  MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
2082  011044  000002                          RTI                     ;;RESTORE PSW
2083  011046  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
2084  011052  012637  001214                  MOV     (SP)+,$TMP6
2085  011056  052737  000340  001214          BIS     #340,$TMP6
2086  011064  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
2087  011070  012746  011076                  MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
2088  011074  000002                          RTI                     ;; POP NEW PC AND PS
2089  011076                          66$:
2090                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
2091  011076  005046                          CLR     -(SP)           ;;
2092  011100  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
2093  011104  012737  011114  000034          MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
2094  011112  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
2095  011114  016666  000002  000006  67$:    MOV     2(SP),6(SP)     ;;
2096  011122  012716  011130                  MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
2097  011126  000002                          RTI                     ;;RESTORE PSW
2098  011130  012637  000034          68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
2099  011134  012662  000002                  MOV     (SP)+,2(ADINT)
2100                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
2101  011140  005046                          CLR     -(SP)           ;;
2102  011142  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
2103  011146  012737  011156  000034          MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
2104  011154  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
2105  011156  016666  000002  000006  69$:    MOV     2(SP),6(SP)     ;;
2106  011164  012716  011172                  MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
```

```
                                RTI                     ;;RESTORE PSW
                        70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
                                MOV     (SP)+,$TMP6
                                BIC     #340,$TMP6
                                MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
                                MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
                                RTI                     ;; POP NEW PC AND PS
                        71$:
                                MOV     #-5,    @CDC    ;SET UP COLUMN COUNT TO READ 1 COLUMN
                                MOV     #160000,@CDA    ;SET UP BUS ADDRESS TO NON-EXISTANT MEMORY
                                MOV     #161,   @CDS    ;SET INTERRUPT ENABLE AND READ, X MEM BITS SET
                                BR      .               ;WAIT FOR INTERRUPT
                        TINT22: CMP     (SP)+,  (SP)+   ;RESTORE STACK
                                CLR     @#232           ;CHANGE INTERRUPT RETURN ADDRESS TO
                                MOV     #232,   @ADINT  ;CAUSE A HALT IF AN INTERRUPT OCCURS
                                TSTB    @CDS            ;CHECK FOR CONTROLLER READY
                                BMI     1$              ;BRANCH IF SET OK
                                ERROR +23                       ;CONTROLLER READY DIDN'T SET

                        1$:     TST     @CDS            ;CHECK FOR ERROR (BIT 15)
                                BMI     2$              ;BRANCH IF SET OK
                                ERROR +26                       ;ERROR BIT 15 NOT SET

                        2$:     BIT     #1000,  @CDS    ;CHECK FOR NON-EXISTANT MEMORY (BIT 9)
                                BNE     3$              ;BRANCH IF SET OK
                                ERROR +27                       ;BIT 9 NOT SET

                        3$:     BIT     #40,    @CDS    ;CHECK FOR EXTENDED MEMORY BIT 17 SET
                                BNE     4$              ;BRANCH IF SET OK
                                ERROR +30                       ;EX-MEM BIT 17 GOT CLEARED

                        4$:     BIT     #20,    @CDS    ;CHECK FOR EX-MEM (BIT 4)
                                BNE     5$              ;BRANCH IF SET OK
                                ERROR +31                       ;EX-MEM (BIT 4) GOT CLEARED

                        5$:     BIT     #076417,@CDS    ;CHECK FOR ANY OTHER BITS
                                BEQ     6$              ;BRANCH IF OK
                                ERROR +32                       ;EXTRA ERROR BITS SET

                        6$:     CMP     #160002,@CDA    ;CHECK ADDRESS BUFFER
                                BEQ     7$              ;BRANCH IF OK
                                MOV     #160002,$TMP4   ;CORRECT 'CDA' CONTENTS FOR ERROR REPORT
                                ERROR +33                       ;BUS ADDRESS REG CHANGED

                        7$:     CMP     #-4,    @CDC    ;CHECK COLUMN COUNT REG
                                BEQ     10$             ;BRANCH IF OK
                                MOV     #-4,$TMP4       ;CORRECT 'CDC' CONTENTS FOR ERROR REPORT
                                ERROR +34                       ;COLUMN COUNT REG CHANGED
                        10$:

                        ;*****************************************************************
                        ;*TEST 23       EXECUTE DATI,DATOB(LOW BYTE) LOAD ON COLUMN COUNT
                        ;*****************************************************************
                        TST23:  SCOPE
```

```
2161  011364  005014                          CLR     @CDC                    ;CLEAR COLUMN COUNT REGISTER
2162                                                                          ;PRIOR TO BYTE LOADING
2163  011366  005114                          COM     @CDC
2164  011370  012700  000152                  MOV     #152,R0
2165  011374  110014                          MOVB    R0,@CDC                 ;ATTEMPT TO LOAD LOWER BYTE
2166                                                                          ;OF COLUMN COUNT REGISTER
2167  011376  020014                          CMP     R0,@CDC                 ;DID HIGH BYTE GET LOADED AS
2168                                                                          ;WELL ON A LOW BYTE LOADING?
2169  011400  001403                          BEQ     1$                      ;BRANCH IF YES
2170  011402  010037  001210                  MOV     R0,$TMP4                ;STORE GOOD DATA - SHOULD BE
2171  011406  104034                          ERROR +34                       ;HIGH BYTE NOT LOADED ON A LOW
2172                                                                          ;BYTE LOAD OF COLUMN COUNT REGISTER
2173  011410                          1$:
2174
2175                                  ;*******************************************************************
2176                                  ;*TEST 24       EXECUTE DATI,DATOB(HIGH BYTE) LOAD ON COLUMN COUNT
2177                                  ;*******************************************************************
2178  011410  000004                  TST24:  SCOPE
2179  011412  005014                          CLR     @CDC                    ;CLEAR COLUMN COUNT REGISTER
2180                                                                          ;PRIOR TO BYTE LOADING
2181  011414  012700  125252                  MOV     #125252,R0              ;SET VALUE FOR BYTE LOAD FROM R0
2182  011420  110064  000001                  MOVB    R0,+1(R4)               ;ATTEMPT TO LOAD HIGH BYTE
2183                                                                          ;OF COLUMN COUNT REGISTER
2184  011424  005714                          TST     @CDC                    ;DID LOW BYTE GET LOADED AS
2185                                                                          ;WELL ON HIGH BYTE LOADING?
2186  011426  001403                          BEQ     1$                      ;BRANCH IF NO
2187  011430  005037  001210                  CLR     $TMP4                   ;STORE GOOD DATA - SHOULD BE
2188  011434  104034                          ERROR +34                       ;LOW BYTE LOADED ON A HIGH
2189                                                                          ;BYTE LOAD OF COLUMN COUNT REGISTER
2190  011436                          1$:
2191
2192                                  ;*******************************************************************
2193                                  ;*TEST 25       EXECUTE DATI,DATIP ON COLUMN COUNT REGISTER
2194                                  ;*******************************************************************
2195  011436  000004                  TST25:  SCOPE
2196  011440  005014                          CLR     @CDC                    ;CLEAR COLUMN COUNT REGISTER
2197                                                                          ;PRIOR TO 'DATIP' PROCESS
2198  011442  012714  100000                  MOV     #100000,@CDC            ;SET A KNOWN VALUE INTO COLUMN
2199                                                                          ;COUNT REGISTER
2200  011446  005414                          NEG     @CDC                    ;PERFORM DATIP, ON COLUMN COUNT
2201                                                                          ;REGISTER
2202  011450  022714  100000                  CMP     #100000,@CDC            ;IS CONTENTS = 100000?
2203  011454  001404                          BEQ     1$                      ;BRANCH IF YES
2204  011456  012737  100000  001210          MOV     #100000,$TMP4           ;STORE GOOD DATA - SHOULD BE
2205  011464  104034                          ERROR +34                       ;CONTENTS OF COLUMN COUNT REGISTER
2206                                                                          ;INCORRECT
2207  011466                          1$:
2208
2209                                  ;*******************************************************************
2210                                  ;*TEST 26       EXECUTE DATI,DATOB(LOW BYTE) LOAD ON BUS ADDRESS
2211                                  ;*******************************************************************
2212  011466  000004                  TST26:  SCOPE
2213  011470  005015                          CLR     @CDA                    ;CLEAR BUS ADDRESS REGISTER
2214                                                                          ;PRIOR TO BYTE LOADING
```

```
2215  011472  005115                          COM     @CDA
2216  011474  012700  000152                  MOV     #152,R0
2217  011500  110015                          MOVB    R0,@CDA         ;ATTEMPT TO LOAD LOWER BYTE
2218                                                                  ;OF BUS ADDRESS REGISTER
2219  011502  020015                          CMP     R0,@CDA         ;DID HIGH BYTE GET LOADED AS
2220                                                                  ;WELL ON A LOW BYTE LOADING?
2221  011504  001403                          BEQ     1$              ;BRANCH IF YES
2222  011506  010037  001210                  MOV     R0,$TMP4        ;STORE GOOD DATA - SHOULD BE
2223  011512  104033                          ERROR +33               ;HIGH BYTE NOT LOADED ON A LOW
2224                                                                  ;BYTE LOAD OF BUS ADDRESS REGISTER
2225  011514                          1$:
2226
2227                                  ;*****************************************************************
2228                                  ;*TEST 27       EXECUTE DATI,DATOB(HIGH BYTE) LOAD ON BUS ADDRESS
2229                                  ;*****************************************************************
2230  011514  000004                  TST27:  SCOPE
2231  011516  005015                          CLR     @CDA            ;CLEAR BUS ADDRESS REGISTER
2232                                                                  ;PRIOR TO BYTE LOADING
2233  011520  012700  125252                  MOV     #125252,R0      ;SET VALUE FOR BYTE LOAD FROM R0
2234  011524  110065  000001                  MOVB    R0,+1(R5)       ;ATTEMPT TO LOAD HIGH BYTE
2235                                                                  ;OF BUS ADDRESS REGISTER
2236  011530  005715                          TST     @CDA            ;DID LOW BYTE GET LOADED AS
2237                                                                  ;WELL ON HIGH BYTE LOADING?
2238  011532  001403                          BEQ     1$              ;BRANCH IF NO
2239  011534  005037  001210                  CLR     $TMP4           ;STORE GOOD DATA - SHOULD BE
2240  011540  104033                          ERROR +33               ;LOW BYTE LOADED ON A HIGH
2241                                                                  ;BYTE LOAD OF BUS ADDRESS REGISTER
2242  011542                          1$:
2243
2244                                  ;*****************************************************************
2245                                  ;*TEST 30       EXECUTE DATI,DATIP ON BUS ADDRESS REGISTER
2246                                  ;*****************************************************************
2247  011542  000004                  TST30:  SCOPE
2248  011544  005015                          CLR     @CDA            ;CLEAR BUS ADDRESS REGISTER
2249                                                                  ;PRIOR TO 'DATIP' PROCESS
2250  011546  012715  100000                  MOV     #100000,@CDA    ;SET A KNOWN VALUE INTO BUS
2251                                                                  ;ADDRESS REGISTER
2252  011552  005415                          NEG     @CDA            ;PERFORM DATIP, ON BUS ADDRESS
2253                                                                  ;REGISTER
2254  011554  022715  100000                  CMP     #100000,@CDA    ;IS CONTENTS = 100000?
2255  011560  001404                          BEQ     1$              ;BRANCH IF YES
2256  011562  012737  100000  001210          MOV     #100000,$TMP4   ;STORE GOOD DATA - SHOULD BE
2257  011570  104033                          ERROR +33               ;CONTENTS OF BUS ADDRESS REGISTER
2258                                                                  ;INCORRECT
2259  011572                          1$:
2260
2261                                  ;*****************************************************************
2262                                  ;*TEST 31       WORD COUNT OVERFLOW TO 2ND CARD
2263                                  ;*****************************************************************
2264  011572  000004                  TST31:  SCOPE
2265  011574  004737  025744                  JSR     PC,INIT         ;INITIALIZE
2266  011600  012712  012146                  MOV     #TINT31,@ADINT  ;SET UP A RETURN ADDRESS
2267                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
2268  011604  005046                          CLR     -(SP)           ;;
```

```
2269  011606  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
2270  011612  012737  011622  000034            MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
2271  011620  104400                            TRAP                    ;;PUSH OLD PSW AN PCON STACK
2272  011622  016666  000002  000006  64$:      MOV     2(SP),6(SP)     ;;
2273  011630  012716  011636                    MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
2274  011634  000002                            RTI                     ;;RESTORE PSW
2275  011636  012637  000034          65$:      MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
2276  011642  012637  001214                    MOV     (SP)+,$TMP6
2277  011646  052737  000340  001214            BIS     #340,$TMP6
2278  011654  013746  001214                    MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
2279  011660  012746  011666                    MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
2280  011664  000002                            RTI                     ;; POP NEW PC AND PS
2281  011666                          66$:
2282                                    ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
2283  011666  005046                            CLR     -(SP)           ;;
2284  011670  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
2285  011674  012737  011704  000034            MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
2286  011702  104400                            TRAP                    ;;PUSH OLD PSW AN PCON STACK
2287  011704  016666  000002  000006  67$:      MOV     2(SP),6(SP)     ;;
2288  011712  012716  011720                    MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
2289  011716  000002                            RTI                     ;;RESTORE PSW
2290  011720  012637  000034          68$:      MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
2291  011724  012662  000002                    MOV     (SP)+,2(ADINT)
2292                                    ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
2293  011730  005046                            CLR     -(SP)           ;;
2294  011732  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
2295  011736  012737  011746  000034            MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
2296  011744  104400                            TRAP                    ;;PUSH OLD PSW AN PCON STACK
2297  011746  016666  000002  000006  69$:      MOV     2(SP),6(SP)     ;;
2298  011754  012716  011762                    MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
2299  011760  000002                            RTI                     ;;RESTORE PSW
2300  011762  012637  000034          70$:      MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
2301  011766  012637  001214                    MOV     (SP)+,$TMP6
2302  011772  042737  000340  001214            BIC     #340,$TMP6
2303  012000  013746  001214                    MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
2304  012004  012746  012012                    MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
2305  012010  000002                            RTI                     ;; POP NEW PC AND PS
2306  012012                          71$:
2307  012012  005046                            CLR     -(SP)           ;;
2308  012014  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
2309  012020  012737  012030  000034            MOV     #72$,34         ;;SETUP NEW TRAP VECTOT
2310  012026  104400                            TRAP                    ;;PUSH OLD PSW AN PCON STACK
2311  012030  016666  000002  000006  72$:      MOV     2(SP),6(SP)     ;;
2312  012036  012716  012044                    MOV     #73$,(SP)               ;;REPLACE OLD PC WITH NEW
2313  012042  000002                            RTI                     ;;RESTORE PSW
2314  012044  012637  000034          73$:      MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
2315  012050  012637  001214                    MOV     (SP)+,$TMP6
2316  012054  052737  000000  001214            BIS     #000,$TMP6
2317  012062  013746  001214                    MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
2318  012066  012746  012074                    MOV     #74$,-(SP)      ;;PUT NEW PC ON  STACK
2319  012072  000002                            RTI                     ;; POP NEW PC AND PS
2320  012074                          74$:
2321  012074  012714  177657                    MOV     #-81.,@CDC              ;SET COLUMN COUNT TO READ 81. COLUMNS
2322                                                                    ;I.E. - WRAP AROUND INTO 2ND CARD
```

```
                                                                ;AUTOMATICALLY
012100  012715  045442                MOV     #BUFBEG,@CDA      ;SET UP STARTING BUFFER ADDRESS
                                                                ;FOR DUMP OF CARD/S CONTENTS
012104  012713  000101                MOV     #101,@CDS         ;SET INTERRUPT ENABLE & READ
012110  105713              1$:       TSTB    @CDS              ;WE COME HERE AWAITING THE INTERRUPT
012112  100376                        BPL     1$                ;AWAIT INTERRUPT
                            ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV 2(ADINT),PS"
012114  016246  000002                MOV     2(ADINT),-(SP)    ;;PUT NEW PS ON STACK
012120  012746  012126                MOV     #75$,-(SP)        ;;PUT NEW PC ON  STACK
012124  000002                        RTI                       ;; POP NEW PC AND PS
012126                      75$:
                                                                ;AND GIVE CONTROL BACK TO THE
                                                                ;PROCESSOR
012126  005013                        CLR     @CDS              ;DISABLE INTERRUPTS
012130  012712  000232                MOV     #232,@ADINT       ;RESTORE INTERRUPT RETURN ADDRESS
012134  005037  000232                CLR     @#232             ;TO 'HALT' IF AN UNEXPECTED INTERRUPT
                                                                ;OCCURS
012140  104041                        ERROR +41                 ;NO INTERRUPT WITH PROCESSOR AT
                                                                ;LEVEL 0
012142  000137  012206                JMP     T31END            ;GO TO NEXT TEST
012146  105713              TINT31:   TSTB    @CDS              ;IS CONTROLLER READY SET?
012150  100401                        BMI     1$                ;BRANCH IF YES
012152  104023                        ERROR +23                 ;INDICATE CONTROLLER READY NOT SET
012154  005013              1$:       CLR     @CDS              ;DISABLE FURTHER INTERRUPTS
012156  012712  000232                MOV     #232,@ADINT       ;RESTORE INTERRUPT RETURN ADDRESS
012162  005037  000232                CLR     @#232             ;TO 'HALT' IF AN UNEXPECTED INTERRUPT
                                                                ;OCCURS
012166  022626                        CMP     (SP)+,(SP)+       ;RESET STACK FROM THE INTERRUPT
012170  022715  045704                CMP     #BUFBEG+242,@CDA  ;WERE 2 CARDS READ??
012174  001404                        BEQ     T31END            ;BRANCH IF APPARENTLY SO
012176  012737  045704  001210        MOV     #BUFBEG+242,$TMP4 ;STORE GOOD DATA - SHOULD BE
012204  104033                        ERROR +33                 ;BUS ADDRESS DOESN'T CORRELATE
                                                                ;TO HAVING READ 2 CARDS
012206                      T31END:

                            ;*****************************************************************
                            ;*TEST 32       BUS ADDRESS ODD & TRANSFER IN NON-PACK MODE
                            ;*****************************************************************
012206  000004              TST32:    SCOPE
012210  004737  025744                JSR     PC,INIT           ;INITIALIZE
012214  012714  177777                MOV     #-1,@CDC          ;SET COLUMN COUNT TO READ 1 COLUMN
012220  012715  045443                MOV     #BUFBEG+1,@CDA    ;SET BUFFER ADDRESS, FOR COLUMN DUMP,
                                                                ;TO HIGH BYTE OF WORD
012224  012737  012250  000010        MOV     #2$,RESVEC        ;SET RETURN FOR ILLEGAL INSTRUCTION
012232  012737  000340  000012        MOV     #340,RESVEC+2     ;SET PS FOR ILLEGAL INSTRUCTION
012240  005213                        INC     @CDS              ;READ A CARD
012242  105713              1$:       TSTB    @CDS              ;WAIT FOR CONTROLLER READY
012244  100376                        BPL     1$                ;WAIT TILL DONE!
012246  000402                        BR      3$                ;GO TO NEXT TEST
012250  104070              2$:       ERROR +70                 ;ODD BUS ADDRESS CAUSED A TRAP IN
                                                                ;NON- PACK MODE
012252  022626                        CMP     (SP)+,(SP)+       ;RESET STACK FROM ILLEGAL INSTRUCTION
                                                                ;TRAP
012254  012737  000012  000010  3$:   MOV     #12,10            ;RESTORE TRAPCATCHER AREA FOR
```

```
2377  012262  005037  000012                    CLR     @#12                    ;UNEXPECTED TRAPS TO LOCATION 10
2378                                            ;CHECK SW7 AND RETURN TO TEST1 IF SET, AFTER RINGING BELL
2379                                            ;OTHERWISE GO INTO THE DATA TEST
2380  012266  000004                           ENDCK:  SCOPE
2381  012270  032777  000200  166640                    BIT     #200,@SWR       ;IS SW<07> SET?
2382  012276  001406                                    BEQ     DATST           ;BRANCH IF NOT TO DATA TESTING
2383  012300  104400  001222                            TYPE,   $BELL           ;RING-A-DING
2384  012304  005137  001254                            COM     TRFLG           ;TOGGLE TRACE FLAG
2385  012310  000137  002534                            JMP     RESTRT          ;GO BACK TO INSTRUCTION TESTS
2386
2387

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

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

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

2398
2399
2400
2401
2402                                            ;*****************************************************************************
2403                                            ;DATA RELIABILITY TEST FOR CD11
2404                                            ;*****************************************************************************
2405
2406
2407                                            ;CHECK SWR FOR TYPE OF DECK BEING TESTED, AND INITIALIZE POINTERS
2408  012314  104400  031305                   DATST:  TYPE,   MDATA   ;INDICATE "ENTERING DATA TESTS"
2409  012320  005037  001212                           CLR     $TMP5   ;INITIALIZE TABLE OFFSET FOR CARD #1 OF DECK
2410  012324  005037  015334                           CLR     CLCNT           ;MAKE SURE COLUMN COUNT IS ZERO
2411  012330  005037  015332                           CLR     CDCNT           ;SETUP CARD COUNT TO ENTER DATA TABLE AT BEGINNING
2412  012334  005037  001260                           CLR     ERFLG           ;FLAG SET PREVENTS PRINTING OUT ERROR HEADING
2413  012340  032777  000020  166570                   BIT     #20,    @SWR    ;CHECK BIT 4 OF @SWR FOR TYPE OF DECK
2414  012346  001412                                   BEQ     ALP1            ;BRANCH IF NOT SET TO LOAD ALPHANUMERIC POINTERS
2415  012350  012737  030160  015326                   MOV     #BINCD, TSTART  ;BIT 2 SET, LOAD BINARY TABLE POINTERS
2416  012356  012737  030420  015330                   MOV     #BINEND+2,TEND
2417  012364  012737  033143  014574                   MOV     #MSG15, DECK
2418  012372  000411                                   BR      CONTD           ;BRANCH AROUND ALPHANUMERIC POINTERS
2419  012374  012737  027600  015326  ALP1:   MOV     #ALPCD, TSTART  ;LOAD ALPHANUMERIC TABLE POINTERS
2420  012402  012737  030040  015330                   MOV     #ALPEND+2,TEND
2421  012410  012737  033132  014574                   MOV     #MSG14, DECK
2422  012416  005737  001254          CONTD:  TST     TRFLG           ;CHECK TRACE TRAP FLAG
2423  012422  001006                                   BNE     TRP1            ;BRANCH IF FLAG WAS SET
2424  012424                          NOTRP1:
2425  012424  013746  000340                   MOV     PR7,-(SP)       ;;PUT NEW PS ON STACK
2426  012430  012746  012436                   MOV     #64$,-(SP)      ;;PUT NEW PC ON  STACK
2427  012434  000002                           RTI                     ;; POP NEW PC AND PS
2428  012436                          64$:
2429  012436  000411                           BR      DCNT1
2430  012440  032777  010000  166470  TRP1:   BIT     #10000, @SWR    ;CHECK SW12 TO INHIBIT TRACE TRAPPING
```

```
2431  012446  001366                        BNE     NOTRP1          ;BRANCH IF SET
2432  012450  013746  000360                MOV     TRACE,-(SP)     ;;PUT NEW PS ON STACK
2433  012454  012746  012462                MOV     #64$,-(SP)      ;;PUT NEW PC ON  STACK
2434  012460  000002                        RTI                     ;; POP NEW PC AND PS
2435  012462                        64$:
2436  012462  004737  025744        DCNT1:  JSR     PC,     INIT    ;INITIALIZE CARD READER STATUS REGISTER
2437
2438                                ;SET UP INTERRUPT SERVICING, AND START READING
2439  012466  012712  012730                MOV     #SRVC,  @ADINT  ;SETUP RETURN POINTER
2440                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
2441  012472  005046                        CLR     -(SP)           ;;
2442  012474  013746  000034                MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
2443  012500  012737  012510  000034        MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
2444  012506  104400                        TRAP                    ;;PUSH OLD PSW AN PCON STACK
2445  012510  016666  000002  000006  64$:  MOV     2(SP),6(SP)     ;;
2446  012516  012716  012524                MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
2447  012522  000002                        RTI                     ;;RESTORE PSW
2448  012524  012637  000034        65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
2449  012530  012637  001214                MOV     (SP)+,$TMP6
2450  012534  042737  000340  001214        BIC     #340,$TMP6
2451  012542  013746  001214                MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
2452  012546  012746  012554                MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
2453  012552  000002                        RTI                     ;; POP NEW PC AND PS
2454  012554                        66$:
2455                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
2456  012554  005046                        CLR     -(SP)           ;;
2457  012556  013746  000034                MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
2458  012562  012737  012572  000034        MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
2459  012570  104400                        TRAP                    ;;PUSH OLD PSW AN PCON STACK
2460  012572  016666  000002  000006  67$:  MOV     2(SP),6(SP)     ;;
2461  012600  012716  012606                MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
2462  012604  000002                        RTI                     ;;RESTORE PSW
2463  012606  012637  000034        68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
2464  012612  012662  000002                MOV     (SP)+,2(ADINT)
2465  012616  013701  015326                MOV     TSTART, R1      ;SET UP TABLE POINTER
2466  012622  012700  045442                MOV     #BUFBEG,R0      ;SET UP BUFFER POINTER
2467  012626  012737  177660  015314        MOV     #-120,  SIZE    ;SET UP "SIZE"
2468  012634  012737  177660  015316        MOV     #-120,  OFFSET
2469  012642  013714  015314                MOV     SIZE,   @CDC    ;SET UP COLUMN COUNT
2470  012646  010015                        MOV     R0,     @CDA    ;SET UP ADDRESS REG
2471  012650  012713  000100                MOV     #100,   @CDS    ;ENABLE INTERRUPTS
2472  012654  032777  000010  166254        BIT     #10,    @SWR    ;CHECK FOR PACK MODE ONLY
2473  012662  001406                        BEQ     CDREAD          ;BRANCH IF NOT SET
2474  012664  032777  000004  166244        BIT     #4,@SWR         ;CHECK FOR IMAGE MODE ONLY
2475  012672  001002                        BNE     CDREAD          ;BRANCH IF SET
2476  012674  004737  014522                JSR     PC,     PAKSET  ;SET UP FOR PACKING MODE
2477  012700  005213        CDREAD: INC     @CDS                    ;READ
2478  012702  032713  004000        BKGND:  BIT     #4000,  @CDS    ;CHECK FOR DATA ERROR
2479  012706  001775                        BEQ     BKGND
2480  012710  011437  015340                MOV     @CDC,   DERCNT  ;SAVE THE COLUMN COUNT
2481  012714  032713  004000        BKGND1: BIT     #4000,  @CDS    ;CHECK FOR DATA ERROR
2482  012720  001375                        BNE     BKGND1          ;BRANCH IF SET
2483  012722  005037  015340                CLR     DERCNT          ;CLR COLUMN COUNT SAVER
2484  012726  000765                        BR      BKGND
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2485
2486                                    ;INTERRUPT SERVICE ROUTINE WHICH RUNS DATA RELIABILITY TEST
2487  012730  105713                    SRVC:   TSTB    @CDS            ;CHECK CONTROLLER READY
2488  012732  100401                            BMI     1$              ;BRANCH IF SET
2489  012734  104023                            ERROR +23                       ;CONTROLLER READY NOT SET
2490  012736  032713  000002            1$:     BIT     #2,     @CDS    ;CHECK FOR DATA PACK MODE
2491  012742  001402                            BEQ     ISR             ;BRANCH IF IMAGE MODE
2492  012744  000137  013640                    JMP     PSR             ;JUMP TO PACK MODE ROUTINE
2493
2494  012750  032713  177477            ISR:    BIT     #177477,@CDS   ;CHECK ALL BITS EXCEPT 6 AND 7
2495  012754  001001                            BNE     1$              ;BRANCH TO ERROR ROUTINE
2496  012756  000402                            BR      2$              ;OTHERWISE, CONTINUE ON
2497  012760  000137  013510            1$:     JMP     ISRER           ;GO TO ERROR ROUTINE
2498  012764  005714                    2$:     TST     @CDC            ;CHECK COLUMN COUNT
2499  012766  001403                            BEQ     3$              ;BRANCH IF OK
2500  012770  005037  001210                    CLR     $TMP4           ;CORRECT 'CDC' CONTENTS FOR ERROR REPORT
2501  012774  104034                            ERROR +34                       ;COLUMN COUNT REGISTER NOT 0
2502
2503  012776  010037  015320            3$:     MOV     R0,     BUFEND
2504  013002  163737  015314  015320            SUB     SIZE,   BUFEND
2505  013010  163737  015314  015320            SUB     SIZE,   BUFEND
2506  013016  023715  015320                    CMP     BUFEND, @CDA
2507  013022  001404                            BEQ     ISRNC
2508  013024  013737  015320  001210            MOV     BUFEND,$TMP4    ;CORRECT 'CDA' CONTENTS FOR ERROR REPORT
2509  013032  104033                            ERROR +33
2510
2511  013034  013737  015314  001250  ISRNC:  MOV     SIZE,   COUNT   ;SET UP COLUMN COUNTER
2512  013042  005777  166172          ISRLP:  TST     @CDDB           ;ARE WE ON A CARD READER WITH
2513                                            ;ECO #14 INSTALLED?
2514  013046  100411                            BMI     1$              ;BRANCH IF YES
2515  013050  012137  001200                    MOV     (R1)+,$TMP0     ;GET THE TABLE VALUE
2516  013054  042737  170000  001200            BIC     #170000,$TMP0   ;STRIP OFF TOP 4 BITS BEFORE COMPARISON
2517  013062  023720  001200                    CMP     $TMP0,(R0)+     ;IS VALUE SAME AS DUMPED INTO MEMORY?
2518  013066  001043                            BNE     ISRDE           ;BRANCH IF NOT THE SAME
2519  013070  000402                            BR      ISRRT           ;OTHERWISE, CONTINUE ON
2520  013072  022021                    1$:     CMP     (R0)+,  (R1)+   ;TEST THE DATA
2521  013074  001040                            BNE     ISRDE           ;BRANCH IF DATA ERROR
2522  013076  020137  015330            ISRRT:  CMP     R1,     TEND    ;CHECK FOR END OF TABLE
2523  013102  100402                            BMI     1$              ;BRANCH IF NOT
2524  013104  013701  015326                    MOV     TSTART, R1      ;MOVE POINTER TO TOP OF TABLE
2525  013110  005237  001250            1$:     INC     COUNT           ;CHECK FOR END OF BUFFER
2526  013114  001415                            BEQ     ISRBE           ;BRANCH IF BUFFER END
2527  013116  005237  015334                    INC     CLCNT           ;KEEP TRACK OF COLUMNS
2528  013122  062737  000002  001212            ADD     #2,$TMP5        ;UPDATE TABLE OFFSET FOR CARD #1 OF DECK
2529  013130  023727  015334  000120            CMP     CLCNT,  #120    ;CHECK FOR END OF CARD
2530  013136  001341                            BNE     ISRLP           ;BRANCH IF NOT END OF CARD
2531  013140  004737  014710                    JSR     PC,     NXCRD   ;INC TO NEXT CARD
2532  013144  005721                            TST     (R1)+           ;UPDATE TABLE POINTER FOR NEXT CARD
2533  013146  000735                            BR      ISRLP
2534
2535  013150  004737  014710          ISRBE:  JSR     PC,     NXCRD   ;GO TO NEXT CARD
2536  013154  005721                  ISRNX:  TST     (R1)+
2537  013156  032777  000004  165752          BIT     #4,     @SWR    ;CHECK FOR IMAGE MODE ONLY
2538  013164  001002                            BNE     ISRNX1          ;BRANCH IF SET
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2539  013166  004737  014522                  JSR     PC,     PAKSET  ;SET UP FOR PACKING MODE
2540  013172  000137  014436          ISRNX1: JMP     SRETRN          ;CALCULATE "SIZE" AND RETURN
2541
2542                                  ;DATA ERROR WAS DETECTED, OUTPUT ERROR PRINTOUT
2543  013176  005737  015332          ISRDE:  TST     CDCNT           ;CHECK FOR FIRST CARD
2544  013202  001102                          BNE     ISRD2           ;BRANCH IF NOT
2545  013204  005740                  ISRD1:  TST     -(R0)           ;SUB 2 FROM POINTER
2546  013206  005237  015332                  INC     CDCNT
2547  013212  005777  166022                  TST     @CDDB           ;ARE WE ON A CARD READER WITH
2548                                                                  ;ECO #14 INSTALLED?
2549  013216  100411                          BMI     1$              ;BRANCH IF YES
2550  013220  012137  001200                  MOV     (R1)+,$TMP0     ;GET THE TABLE VALUE
2551  013224  042737  170000  001200          BIC     #170000,$TMP0   ;STRIP OFF TOP 4 BITS BEFORE COMPARISON
2552  013232  023720  001200                  CMP     $TMP0,(R0)+     ;DOES VALUE MATCH THAT DUMPED INTO MEMORY?
2553  013236  001051                          BNE     6$              ;BRANCH IF NO
2554  013240  000402                          BR      2$              ;OTHERWISE, CONTINUE ON
2555  013242  022021                  1$:     CMP     (R0)+,  (R1)+   ;TEST THE DATA
2556  013244  001046                          BNE     6$              ;BRANCH IF NOT THE SAME
2557  013246  062701  000042          2$:     ADD     #42,    R1      ;ADD THE MAGIC NUMBER
2558  013252  020137  015330                  CMP     R1,     TEND    ;CHECK FOR RAP AROUND
2559  013256  003402                          BLE     3$              ;BRANCH IF NOT
2560  013260  162701  000240                  SUB     #240,   R1      ;RAP AROUND
2561  013264  005777  165750          3$:     TST     @CDDB           ;ARE WE ON A CARD READER WITH
2562                                                                  ;ECO #14 INSTALLED?
2563  013270  100412                          BMI     7$              ;BRANCH IF YES
2564  013272  011137  001200                  MOV     (R1),$TMP0      ;GET THE TABLE VALUE
2565  013276  042737  170000  001200          BIC     #170000,$TMP0   ;STRIP OFF TOP 4 BITS BEFORE COMPARISON
2566  013304  026037  000042  001200          CMP     42(R0),$TMP0    ;DOES VALUE MATCH FOR A DOUBLE?
2567  013312  001014                          BNE     5$              ;BRANCH IF NO
2568  013314  000403                          BR      4$              ;OTHERWISE, CONTINUE ON
2569  013316  026011  000042          7$:     CMP     42(R0), (R1)    ;CHECK FOR DOUBLE MATCH
2570  013322  001010                          BNE     5$              ;BRANCH IF NOT
2571  013324  162701  000042          4$:     SUB     #42,    R1      ;SUBTRACT THE MAGIC NUMBER
2572  013330  020137  015326                  CMP     R1,     TSTART  ;CHECK FOR RAP AROUND
2573  013334  003260                          BGT     ISRRT           ;BRANCH IF NOT
2574  013336  062701  000240                  ADD     #240,   R1      ;RAP AROUND
2575  013342  000655                          BR      ISRRT           ;GO CHECK REST OF DATA
2576
2577  013344  162701  000042          5$:     SUB     #42,    R1      ;SUBTRACT MAGIC NUMBER
2578  013350  020137  015326                  CMP     R1,     TSTART  ;CHECK FOR RAP AROUND
2579  013354  003002                          BGT     6$              ;BRANCH IF NOT
2580  013356  062701  000240                  ADD     #240,   R1      ;RAP AROUND
2581  013362  020137  015330          6$:     CMP     R1,     TEND
2582  013366  001306                          BNE     ISRD1
2583  013370  013701  015326                  MOV     TSTART,R1       ;OBTAIN THE 1ST TABLE ENTRY
2584  013374  063701  001212                  ADD     $TMP5,R1        ;ADD TABLE OFFSET FOR CARD #1 OF DECK
2585  013400  062701  000002                  ADD     #2,R1           ;GO AHEAD ONE TABLE POSITION FOR ERROR REPORT
2586  013404  005037  015332                  CLR     CDCNT           ;RESET CARD COUNTER
2587  013410  032777  020000  165520  ISRD2:  BIT     #20000,@SWR     ;CK SW13 FOR INHIBIT PRINTOUT
2588  013416  001026                          BNE     ISRDE4          ;BRANCH IF SET
2589  013420  004737  014554                  JSR     PC,     TYHEAD  ;TYPE HEADING, DECK, CDCNT, CLCNT
2590  013424  005777  165610                  TST     @CDDB           ;ARE WE ON A CARD READER WITH
2591                                                                  ;ECO #14 INSTALLED?
2592  013430  100410                          BMI     1$              ;BRANCH IF YES
```

```
2593  013432  014137  001200                  MOV     -(R1),$TMPO     ;GET THE TABLE VALUE
2594  013436  042737  170000  001200          BIC     #170000,$TMPO   ;STRIP OFF TOP 4 BITS BEFORE PRINTOUT
2595  013444  013746  001200                  MOV     $TMPO,-(SP)     ;PLACE VALUE ON STACK FOR PRINTOUT
2596  013450  000401                          BR      2$              ;GO TO PRINT OUT VALUE
2597  013452  014146                  1$:     MOV     -(R1),-(SP)     ;PUSH SHOULD BE DATA ONTO STACK
2598  013454  104402                  2$:     TYPOS                   ;SYSMAC ROUTINE
2599  013456     006                          .BYTE   6               ;FOR
2600  013457     001                          .BYTE   1               ;ERROR TYPEOUT
2601  013460  104400  030545                  TYPE,   SPACE
2602  013464  014046                          MOV     -(R0),-(SP)     ;PUSH WAS DATA
2603  013466  104402                          TYPOS                   ;ONTO STACK
2604  013470     006                          .BYTE   6               ;FOR
2605  013471     001                          .BYTE   1               ;ERROR TYPEOUT
2606  013472  022021                          CMP     (R0)+,  (R1)+   ;RESET POINTERS
2607  013474  005777  165436          ISRDE4: TST     @SWR            ;CHECK FOR HALT ON ERROR
2608  013500  100001                          BPL     1$              ;BRANCH IF HALT ON ERROR NOT SET
2609  013502  000000                          HALT                    ;HALT ON ERROR SET
2610  013504  000137  013076          1$:     JMP     ISRRT
2611
2612                                  ;INTERRUPT DUE TO SOME KIND OF ERROR
2613                                  ;THESE ERRORS ARE DISASTEROUS, THEREFORE THE DATA TEST IS RESTARTED
2614  013510  100402                  ISRER:  BMI     ISRE1           ;BRANCH ON ERROR BIT 15
2615  013512  104026                          ERROR +26               ;ERROR BIT 15 NOT SET
2616  013514  000447                          BR      ISRST
2617
2618  013516  032713  010000          ISRE1:  BIT     #10000, @CDS    ;CHECK FOR OFF-LINE
2619  013522  001414                          BEQ     ISRE2
2620  013524  032713  040000                  BIT     #40000, @CDS    ;CHECK FOR CARD READER ERROR
2621  013530  001002                          BNE     1$              ;BRANCH IF SET
2622  013532  104035                          ERROR +35               ;OFF-LINE BUT NOT CARD READER ERROR
2623  013534  000413                          BR      ISRE3
2624
2625  013536  004737  014650          1$:     JSR     PC,     LASTCD  ;CHECK FOR LAST CARD
2626  013542  002002                          BGE     2$              ;BRANCH IF BOTH CARD
2627  013544  104057                          ERROR +57               ;CARD READER ERROR BUT NOT BOTH CARD
2628  013546  000432                          BR      ISRST
2629  013550  000137  013034          2$:     JMP     ISRNC           ;IF BOTH CARD - GO HERE!
2630
2631  013554  032713  040000          ISRE2:  BIT     #40000, @CDS    ;CHECK FOR CARD READER ERROR
2632  013560  001401                          BEQ     ISRE3           ;BRANCH IF NOT
2633  013562  104060                          ERROR +60               ;CARD READER ERROR BUT NOT OFF LINE
2634
2635  013564  032713  020000          ISRE3:  BIT     #20000, @CDS
2636  013570  001401                          BEQ     1$
2637  013572  104061                          ERROR +61               ;END OF FILE ERROR (M1200 ONLY)
2638
2639  013574  032713  004000          1$:     BIT     #4000,  @CDS
2640  013600  001401                          BEQ     2$
2641  013602  104062                          ERROR +62               ;DATA ERROR
2642
2643  013604  032713  002000          2$:     BIT     #2000,  @CDS
2644  013610  001401                          BEQ     3$
2645  013612  104063                          ERROR +63               ;DATA LATE ERROR
2646
```

```
2647  013614  032713  001000          3$:     BIT     #1000,  @CDS
2648  013620  001401                          BEQ     4$
2649  013622  104064                          ERROR +64                       ;NON-EXISTANT MEMORY ERROR
2650  013624  032713  077000          4$:     BIT     #077000,@CDS    ;CHECK ALL ERROR BITS
2651  013630  001001                          BNE     ISRST           ;BRANCH IF AT LEAST ONE
2652  013632  104037                          ERROR +37                       ;NONE OF THE ERROR BITS SET
2653  013634  000137  015306          ISRST:  JMP     DATRST          ;RESTART THE ENTIRE DATA TEST
2654
2655  013640  032713  177475          PSR:    BIT     #177475,@CDS    ;CHECK ALL BITS EXCEPT 1,6 AND 7
2656  013644  001402                          BEQ     1$              ;BRANCH IF OK:
2657  013646  000137  014256                  JMP     PSRER           ;OTHERWISE, GO TO REPORT ERROR
2658  013652  005714                  1$:     TST     @CDC            ;CHECK COLUMN COUNT REG.
2659  013654  001403                          BEQ     2$              ;BRANCH IF OK
2660  013656  005037  001210                  CLR     $TMP4           ;CORRECT 'CDC' CONTENTS FOR ERROR REPORT
2661  013662  104034                          ERROR +34                       ;
2662  013664  010037  015320          2$:     MOV     R0,     BUFEND
2663  013670  163737  015314  015320        SUB     SIZE,   BUFEND
2664  013676  023715  015320                CMP     BUFEND, @CDA
2665  013702  001404                          BEQ     PSRNC
2666  013704  013737  015320  001210        MOV     BUFEND,$TMP4    ;CORRECT 'CDA' CONTENTS FOR ERROR REPORT
2667  013712  104033                          ERROR +33
2668  013714  013737  015314  001250  PSRNC: MOV     SIZE,   COUNT   ;SET UP COLUMN COUNTER
2669  013722  122021          PSRLP:  CMPB    (R0)+,  (R1)+   ;TEST THE DATA
2670  013724  001052                          BNE     PSRDE           ;BRANCH IF DATA ERROR
2671  013726  020137  015330          PSRRT:  CMP     R1,     TEND    ;CHECK FOR END OF TABLE
2672  013732  100402                          BMI     1$              ;BRANCH IF NOT
2673  013734  013701  015326                  MOV     TSTART, R1      ;MOVE POINTER TO TOP OF TABLE
2674  013740  005237  001250          1$:     INC     COUNT           ;CHECK FOR END OF BUFFER
2675  013744  001415                          BEQ     PSRBE           ;BRANCH IF BUFFER END
2676  013746  005237  015334                  INC     CLCNT           ;KEEP TRACK OF COLUMNS
2677  013752  062737  000001  001210        ADD     #1,$TMP4        ;UPDATE TABLE OFFSET FOR CARD #1 OF DECK
2678  013760  023727  015334  000120        CMP     CLCNT,  #120    ;CHECK FOR END OF CARD
2679  013766  001355                          BNE     PSRLP           ;BRANCH IF NOT END OF CARD
2680  013770  004737  014710                  JSR     PC,     NXCRD   ;GO TO NEXT CARD
2681  013774  105721                          TSTB    (R1)+           ;UPDATE TABLE POINTER FOR NEXT CARD
2682  013776  000751                          BR      PSRLP
2683
2684  014000  004737  014710  PSRBE: JSR     PC,     NXCRD   ;GO TO NEXT CARD
2685  014004  105721          PSRNX:  TSTB    (R1)+
2686  014006  032777  000010  165122        BIT     #10,    @SWR
2687  014014  001014                          BNE     PSRNX1
2688  014016  162737  000240  015326        SUB     #160.,  TSTART  ;MOVE TABLE POINTER TO IMAGE TABLE
2689  014024  162737  000120  015330        SUB     #80.,   TEND
2690  014032  162701  000240                SUB     #160.,  R1      ;UPDATE TABLE POINTER
2691  014036  063701  015332                ADD     CDCNT,  R1      ;COMPENSATE FOR BYTES
2692  014042  042713  000002                BIC     #2,     @CDS    ;CLR PACKING MODE BIT
2693  014046  000137  014436  PSRNX1: JMP     SRETRN          ;CALCULATE "SIZE" AND READ MORE CARDS
2694
2695                          ;DATA ERROR WAS DETECTED, OUTPUT ERROR PRINTOUT
2696  014052  005737  015332  PSRDE:  TST     CDCNT
2697  014056  001051                          BNE     PSRD2
2698  014060  105740          PSRD1:  TSTB    -(R0)           ;SUB 1 FROM POINTER
2699  014062  005237  015332                  INC     CDCNT
2700  014066  122021                          CMPB    (R0)+,  (R1)+   ;TEST THE DATA
```

```
2701  014070  001031                          BNE     1$              ;BRANCH IF NOT THE SAME
2702  014072  062701  000021                  ADD     #21,    R1      ;ADD THE MAGIC NUMBER
2703  014076  020137  015330                  CMP     R1,     TEND    ;CHECK FOR RAP AROUND
2704  014102  003402                          BLE     2$              ;BRANCH IF NOT
2705  014104  162701  000120                  SUB     #120,   R1      ;RAP AROUND
2706  014110  126011  000021          2$:     CMPB    21(R0), (R1)    ;CHECK FOR DOUBLE MATCH
2707  014114  001010                          BNE     3$              ;BRANCH IF NOT
2708  014116  162701  000021                  SUB     #21,    R1      ;SUBTRACT THE MAGIC NUMBER
2709  014122  020137  015326                  CMP     R1,     TSTART  ;CHECK FOR RAP AROUND
2710  014126  003277                          BGT     PSRRT           ;BRANCH IF NOT
2711  014130  062701  000120                  ADD     #120,   R1      ;RAP AROUND
2712  014134  000674                          BR      PSRRT           ;GO CHECK REST OF DATA
2713
2714  014136  162701  000021          3$:     SUB     #21,    R1      ;SUBTRACT MAGIC NUMBER
2715  014142  020137  015326                  CMP     R1,     TSTART  ;CHECK FOR RAP AROUND
2716  014146  003002                          BGT     1$              ;BRANCH IF NOT
2717  014150  062701  000120                  ADD     #120,   R1      ;RAP AROUND
2718  014154  020137  015330          1$:     CMP     R1,     TEND
2719  014160  001337                          BNE     PSRD1
2720  014162  013701  015326                  MOV     TSTART,R1       ;OBTAIN THE 1ST TABLE ENTRY
2721  014166  063701  001212                  ADD     $TMP5,R1        ;ADD TABLE OFFSET FOR CARD #1 OF DECK
2722  014172  062701  000001                  ADD     #1,R1           ;GO AHEAD ONE TABLE POSITION FOR ERROR REPORT
2723  014176  005037  015332                  CLR     CDCNT           ;RESET CARD COUNTER
2724  014202  032777  020000  164726  PSRD2:  BIT     #20000,@SWR     ;CK SW13 FOR INHIBIT PRINTOUT
2725  014210  001015                          BNE     PSRDE3          ;BRANCH IF SET
2726  014212  004737  014554                  JSR     PC,     TYHEAD  ;TYPE HEADING, DECK, CDCNT, CLCNT
2727  014216  104400  030545                  TYPE,   SPACE
2728  014222  114146                          MOVB    -(R1),-(SP)     ;PUSH SHOULD BE DATA
2729  014224  104402                          TYPOS                   ;ONTO STACK
2730  014226     003                          .BYTE   3               ;FOR
2731  014227     000                          .BYTE   0               ;ERROR TYPEOUT
2732  014230  104400  030542                  TYPE,   SPACE-3
2733  014234  114046                          MOVB    -(R0),-(SP)     ;PUSH WAS DATA
2734  014236  104402                          TYPOS                   ;ONTO STACK
2735  014240     003                          .BYTE   3               ;FOR
2736  014241     000                          .BYTE   0               ;ERROR TYPEOUT
2737  014242  122021                          CMPB    (R0)+,  (R1)+   ;RESET POINTERS
2738  014244  005777  164666          PSRDE3: TST     @SWR            ;CHECK FOR HALT ON ERROR
2739  014250  100001                          BPL     1$              ;BRANCH IF HALT ON ERROR NOT SET
2740  014252  000000                          HALT                    ;HALT ON ERROR SET
2741  014254  000624                  1$:     BR      PSRRT
2742
2743                                  ;INTERRUPT DUE TO SOME KIND OF ERROR
2744  014256  100402                  PSRER:  BMI     PSRE1           ;BRANCH ON ERROR BIT 15
2745  014260  104026                          ERROR +26                       ;ERROR BIT 15 NOT SET
2746  014262  000463                          BR      PSRST
2747
2748  014264  032713  004000          PSRE1:  BIT     #4000,  @CDS
2749  014270  001414                          BEQ     PSRE2           ;BRANCH IF NOT
2750  014272  032713  000002                  BIT     #2,     @CDS
2751  014276  001001                          BNE     1$
2752  014300  104065                          ERROR +65
2753  014302  032777  000020  164626  1$:     BIT     #20,    @SWR
2754  014310  001001                          BNE     2$              ;BRANCH IF BINARY DECK
```

```
                                        ERROR +66
014312  104066
014314  012737  177660  001250  2$:     MOV     #-120,  COUNT   ;ONLY READ ONE CARD
014322  032713  010000          PSRE2:  BIT     #10000, @CDS    ;CHECK FOR OFF-LINE
014326  001415                  BEQ     PSRE3
014330  032713  040000                  BIT     #40000, @CDS    ;CHECK FOR CARD READER ERROR
014334  001002                  BNE     1$                      ;BRANCH IF SET
014336  104035                  ERROR +35                               ;OFF-LINE BUT NOT CARD READER ERROR
014340  000414                  BR      PSRE4

014342  004737  014650          1$:     JSR     PC,     LASTCD  ;CHECK FOR LAST CARD
014346  002402                  BLT     2$                      ;BRANCH IF NOT
014350  000137  013714          JMP     PSRNC                   ;BRANCH IF BOTH CARD
014354  104057                  2$:     ERROR +57                       ;CARD READER ERROR BUT NOT BOTH CARD
014356  000137  015306                  JMP     DATRST          ;RESTART THE ENTIRE TEST

014362  032713  040000          PSRE3:  BIT     #40000, @CDS    ;CHECK FOR CARD READER ERROR
014366  001401                  BEQ     PSRE4                   ;BRANCH IF NOT
014370  104060                  ERROR +60                               ;CARD READER ERROR BUT NOT OFF LINE

014372  032713  020000          PSRE4:  BIT     #20000, @CDS
014376  001401                  BEQ     1$
014400  104061                  ERROR +61                               ;END OF FILE ERROR (M1200 ONLY)

014402  032713  002000          1$:     BIT     #2000,  @CDS
014406  001401                  BEQ     2$
014410  104063                  ERROR +63                               ;DATA LATE ERROR

014412  032713  001000          2$:     BIT     #1000,  @CDS
014416  001401                  BEQ     3$
014420  104064                  ERROR +64                               ;NON-EXISTANT MEMORY ERROR
014422  032713  077000          3$:     BIT     #077000,@CDS    ;CHECK ALL ERROR BITS
014426  001001                  BNE     PSRST                   ;BRANCH IF AT LEAST ONE
014430  104037                  ERROR +37                               ;NONE OF THE ERROR BITS SET
014432  000137  013722          PSRST:  JMP     PSRLP           ;GO CHECK THE DATA

                                ;RETURN PORTION OF INTERRUPT SERVICE ROUTINE
                                ;CALCULATES A NEW "SIZE" (NUMBER OF COLUMNS TO BE READ)
                                ;SETS UP THE CARD READER BUFFERS, AND ISSUES THE READ COMMAND
                                ;THEN DOES AN RTI TO THE BACKGROUND ROUTINE
014436  063737  015316  015314  SRETRN: ADD     OFFSET, SIZE
014444  100404                  BMI     SRETR1
014446  012737  177660  015316          MOV     #-120,  OFFSET
014454  000770                  BR      SRETRN
014456  032737  001000  015314  SRETR1: BIT     #001000,SIZE
014464  001004                  BNE     SRETR4
014466  012737  000120  015316  SRETR3: MOV     #120,   OFFSET
014474  000760                  BR      SRETRN
014476  004737  014650          SRETR4: JSR     PC,     LASTCD  ;CHECK FOR MORE THAN 80 CARDS
014502  003371                  BGT     SRETR3                  ;BRANCH IF GREATER
014504  013714  015314                  MOV     SIZE,   @CDC    ;SET UP COLMN COUNT
014510  012700  045442                  MOV     #BUFBEG,R0      ;RESET TABLE POINTER
014514  010015                  MOV     R0,     @CDA            ;SET UP ADDRESS REG
014516  005213                  INC     @CDS                    ;READ
014520  000002                  RTI
```

```
2809
2810
2811                                    ;SUBROUTINE TO SET PACKING MODE AND MOVE THE POINTERS FOR THE DATA.
2812  014522  062737  000240  015326  PAKSET: ADD     #160.,  TSTART  ;MOVE TABLE POINTER TO PACKED TABLE
2813  014530  062737  000120  015330          ADD     #80.,   TEND
2814  014536  062701  000240                  ADD     #160.,  R1      ;UPDATE TABLE POINTER
2815  014542  163701  015332                  SUB     CDCNT,  R1      ;COMPENSATE FOR BYTES
2816  014546  052713  000002                  BIS     #2,     @CDS    ;SET PACKING MODE BIT
2817  014552  000207                          RTS     PC
2818
2819                                    ;SUBROUTINE TO TYPE HEADING, TYPE OF DECK, CARD COUNT, AND COLUMN COUNT
2820  014554  005737  001260          TYHEAD: TST     ERFLG           ;CHECK FOR FIRST ERROR
2821  014560  001004                          BNE     NOHEAD          ;BRANCH IF NOT
2822  014562  005237  001260                  INC     ERFLG           ;SET FLAG
2823  014566  104400  033053                  TYPE,   MSG13           ;TYPE HEADING FOR DATA ERRORS
2824  014572  104400                  NOHEAD: TYPE                    ;OUTPUT TYPE OF DECK
2825  014574  000000                  DECK:   DUMMY                   ;POINTER TO DECK TITLE
2826  014576  104400  030545                  TYPE,   SPACE
2827  014602  005237  015332                  INC     CDCNT           ;ADJUST CADR COUNT
2828  014606  013746  015332                  MOV     CDCNT,-(SP)
2829  014612  104404                          TYPDS
2830  014614  005337  015332                  DEC     CDCNT           ;READJUST CADR COUNT
2831  014620  104400  030540                  TYPE,   SPACE-5
2832  014624  005237  015334                  INC     CLCNT           ;ADJUST COLUMN COUNT
2833  014630  013746  015334                  MOV     CLCNT,-(SP)
2834  014634  104404                          TYPDS
2835  014636  005337  015334                  DEC     CLCNT           ;READJUST COLUMN COUNT
2836  014642  104400  030543                  TYPE,   SPACE-2
2837  014646  000207                          RTS     PC
2838
2839                                    ;SUBROUTINE TO CHECK FOR LAST CARD
2840  014650  013737  015314  015322  LASTCD: MOV     SIZE,   TEMP1
2841  014656  013737  015332  015324          MOV     CDCNT,  TEMP2
2842  014664  005237  015324          LSTCD1: INC     TEMP2
2843  014670  062737  000120  015322          ADD     #120,   TEMP1
2844  014676  100772                          BMI     LSTCD1
2845  014700  023727  015324  000120          CMP     TEMP2,  #80.
2846  014706  000207                          RTS     PC
2847
2848                                    ;SUBROUTINE TO KEEP TRACK OF CARDS
2849  014710  005037  015334          NXCRD:  CLR     CLCNT           ;RESET COLUMN COUNT
2850  014714  005037  001212                  CLR     $TMP5
2851  014720  005237  015332                  INC     CDCNT           ;KEEP TRACK OF CARDS
2852  014724  023727  015332  000120          CMP     CDCNT,  #120    ;CHECK FOR 80TH CARD
2853  014732  002001                          BGE     $EOP
2854  014734  000207                          RTS     PC              ;RETURN
2855
2856
2857                                    ;******************************************************************
2858
2859                                    .SBTTL  END OF PASS ROUTINE
2860
2861                                    ;*INCREMENT THE PASS NUMBER ($PASS)
2862                                    ;*TYPE "END PASS #XXXXX" (WHERE XXXXX IS A DECIMAL NUMBER)
```

```
                                        ;*IF SW12=1 INHIBIT TRACE TRAP
                                        ;*IF THERES A MONITOR GO TO IT
                                        ;*IF THERE ISN'T JUMP TO HOOK1

014736                                  $EOP:
014736  005726                                TST     (SP)+           ;CORRECT STACK POINTER TO REPLACE 'RTS'
014740  022626                                CMP     (SP)+,(SP)+     ;CORRECT STACK POINTER TO REPLACE 'RTI'
014742  005037  001102                        CLR     $TSTNM          ;;ZERO THE TEST NUMBER
014746  005037  001220                        CLR     $TIMES          ;;ZERO THE NUMBER OF ITERATIONS
014752  005237  001100                        INC     $PASS           ;;INCREMENT THE PASS NUMBER
014756  042737  100000  001100              BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
014764  005327                              DEC     (PC)+           ;;LOOP?
014766  000001                          $EOPCT: .WORD   1
014770  003032                              BGT     $DOAGN          ;;YES
014772  012737                              MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
014774  000001                          $ENDCT: .WORD   1
014776  014766                                  $EOPCT
015000  104400  015150                        TYPE    ,$ENDMG         ;;TYPE "END PASS #"
015004  013746  001100                        MOV     $PASS,-(SP)     ;;SAVE $PASS FOR TYPEOUT
015010  104404                              TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
015012  104400  015165                        TYPE    ,$ENULL         ;;TYPE A NULL CHARACTER
015016                                  $GET42:
015016  013700  000042                        MOV     @#42,R0         ;;GET MONITOR ADDRESS
015022  001415                              BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
015024  000005                              RESET                   ;;MONITOR,CLEAR WORLD
015026  005046                              CLR     -(SP)           ;;INSURE THE "T" BIT IS CLEAR
015030  012746  015046                        MOV     #$ENDAD,-(SP)   ;;SETUP FOR AN RTI OR RTT
015034  000441                              BR      $RTRN           ;;GO DO AN RTI OR RTT TO LOAD THE PSW
                                                                    ;;WITH A CLEARED "T" BIT


015036  013700  000042                        MOV     @#42,R0         ;;GET MONITOR ADDRESS
015042  001405                              BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
015044  000005                              RESET                   ;;CLEAR THE WORLD
015046  004710                          $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
015050  000240                              NOP                     ;;SAVE ROOM
015052  000240                              NOP                     ;;FOR
015054  000240                              NOP                     ;;ACT11
015056                                  $DOAGN:
015056  005046                              CLR     -(SP)           ;;RESERVE A STACK LOC. FOR THE PS
015060  013746  000034                        MOV     @#34,-(SP)      ;;SETUP THE TRAP VECTOR
015064  012737  015074  000034                MOV     #1$,@#34        ;; TO GET THE PS
015072  104400                              TRAP
015074  005726                          1$:     TST     (SP)+           ;;CLEAN OFF THE USED PC
015076  012666  000002                        MOV     (SP)+,2(SP)     ;;SAVE OFF THE PS
015102  012637  000034                        MOV     (SP)+,@#34      ;;RESTORE TRAP VECTOR
015106  042716  000020                        BIC     #20,(SP)        ;;CLEAR THE "T" BIT
015112  032777  010000  164016                BIT     #BIT12,@SWR     ;; RUN WITH TRACE TRAP?
015120  001005                              BNE     2$              ;;BR IF NO
015122  005137  015146                        COM     $TBIT           ;;IS IT TIME FOR TRACE TRAP
015126  100402                              BMI     2$              ;;BR IF NO
015130  052716  000020                        BIS     #20,(SP)        ;;SET TRACE TRAP
015134  012746  015142                  2$:     MOV     #$LOOP,-(SP)    ;;JUMP TO START OF TEST
015140  000002                          $RTRN:  RTI                     ;;RETURN--THIS IS CHANGED TO
                                                                    ;;AN "RTT" IF "RTT" IS LEGAL
```

```
                                                        ;;INSTRUCTION
015142                          $LOOP:
015142  000137  015170                  JMP     @#HOOK1         ;;RETURN
015146  000000                  $TBIT:  0
015150  005015  047105  020104  $ENDMG: .ASCIZ  <15><12>/END PASS */
015156  040520  051523  021440
015164     000
015165     377     377     000  $ENULL: .BYTE   -1,-1,0          ;;NULL CHARACTER STRING

015170  032777  000040  163740  HOOK1:  BIT     #40,@SWR                ;CHECK @SWR FOR HALT AT END OF DECK
015176  001402                          BEQ     ONLINE          ;CONTINUE IF NOT SET
015200  000000                          HALT                    ;END OF DECK,SW5 SET
015202  000427                          BR      DECKCK

015204  032713  010000          ONLINE: BIT     #10000, @CDS    ;CHECK FOR OFF-LINE
015210  001424                          BEQ     DECKCK          ;BRANCH IF NOT
015212  005713                          TST     @CDS            ;CHECK FOR ERROR (BIT 15)
015214  100401                          BMI     1$              ;BRANCH IF SET OK
015216  104026                          ERROR +26                       ;ERROR BIT 15 NOT SET

015220  032713  040000          1$:     BIT     #40000, @CDS    ;CHECK FOR CARD READER ERROR
015224  001001                          BNE     2$              ;BRANCH IF SET OK
015226  104035                          ERROR +35                       ;OFF-LINE NOT DUE TO CARD READER ERROR

015230  032713  023471          2$:     BIT     #023471,@CDS    ;CHECK FOR EXTRA BITS SET
015234  001401                          BEQ     3$              ;BRANCH IF OK
015236  104015                          ERROR +15                       ;EXTRA ERROR BITS SET

015240  012712  015250          3$:     MOV     #ONINT, @ADINT  ;SET UP INTERRUPT VECTOR
015244  000001                  4$:     WAIT                    ;WAIT FOR AN INTERRUPT
015246  000776                          BR      4$              ;WAIT ON TRACE TRAPS

015250  032713  000010          ONINT:  BIT     #10,    @CDS    ;CHECK FOR TRANSITION TO ON LINE
015254  001001                          BNE     1$              ;BRANCH IF SET OK
015256  104036                          ERROR +36                       ;INTERRUPT BY OTHER THAN BIT 3 SETTING

015260  022626                  1$:     CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
                                ;WHEN CONTINUING FROM ONE DECK TO ANOTHER, CHECK SW6 FOR TYPE
                                ;OF TESTING TO BE PERFORMED
015262  005137  001254          DECKCK: COM     TRFLG           ;TOGGLE TRACE FLAG
015266  032777  000100  163642          BIT     #100,@SWR               ;CHECK SW6
015274  001402                          BEQ     1$              ;BRANCH IF NOT SET
015276  000137  002534                  JMP     RESTRT          ;RERUN COMBINED INSTRUCTION AND DATA TEST
015302  000137  012314          1$:     JMP     DATST

015306  022626          DATRST: CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
015310  000137  012314                  JMP     DATST           ;RESTART DATA TEST

015314  177660          SIZE:   -120
015316  177660          OFFSET: -120
015320  000000          BUFEND: 0
015322  000000          TEMP1:  0
015324  000000          TEMP2:  0
015326  000000          TSTART: 0                       ;STARTING ADDRESS OF DATA TABLE
```

```
 2971  015330  000000                TEND:   0          ;END ADDRESS OF DATA TABLE
 2972  015332  000000                CDCNT:  0          ;NUMBER OF CARD BEING READ
 2973  015334  000000                CLCNT:  0          ;NUMBER OF COLUMN BEING CHECKED
 2974  015336  000000                PTOFF:  0          ;OFFSET TO POINTER FOR DATA PRINTOUT
 2975  015340  000000                DERCNT: 0          ;DATA ERROR COLUMN COUNT
```

```
                                        ;SETUP FOR ERROR FUNCTION TEST
                                ER1200:
015342                                  MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
015342  012706  001100                   CLR     (R6)+           ;;CLEAR MEMORY LOCATION
015346  005026                          CMP     #$BDDAT,R6      ;;DONE?
015350  022706  001126                   BNE     .-6             ;;LOOP BACK IF NO
015354  001374                          MOV     #STACK,SP       ;;SETUP THE STACK POINTER
015356  012706  001100                   MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
015362  012737  026326  000020           MOV     #340,@#IOTVEC+2 ;;LEVEL 7
015370  012737  000340  000022           MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
015376  012737  026152  000030           MOV     #340,@#EMTVEC+2 ;;LEVEL 7
015404  012737  000340  000032           MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
015412  012737  027374  000034           MOV     #340,@#TRAPVEC+2;LEVEL 7
015420  012737  000340  000036           MOV     #$PWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
015426  012737  027430  000024           MOV     #340,@#PWRVEC+2 ;;LEVEL 7
015434  012737  000340  000026           MOV     $ENDCT,$EOPCT   ;;SETUP END-OF-PROGRAM COUNTER
015442  013737  014774  014766           CLR     $TIMES          ;;INITIALIZE NUMBER OF ITERATIONS
015450  005037  001220                   MOV     #$RTRN,@#TBITVEC ;;SET "T" BIT VECTOR TO $RTRN
015454  012737  015140  000014           MOV     #340,@#TBITVEC+2 ;;LEVEL 7
015462  012737  000340  000016           MOV     #RTI,$RTRN      ;;SET $RTRN TO A RTI
015470  012737  000002  015140           MOV     #65$,@#RESVEC   ;;TRY TO DO A RTT
015476  012737  015524  000010           CLR     -(SP)           ;;DUMMY PS
015504  005046                          MOV     #64$,-(SP)      ;;AND PC
015506  012746  015514                   RTT                     ;;TRY THE RTT
015512  000006                  64$:    MOV     #RTT,$RTRN      ;;RTT IS LEGAL--SET $RTRN TO A RTT
015514  012737  000006  015140           BR      66$
015522  000402                  65$:    ADD     #10,SP          ;;RTT ILLEGAL--CLEAN OFF THE STACK
015524  062706  000010          66$:    MOV     #RESVEC+2,@#RESVEC ;;RESTORE TRAP CATCHER
015530  012737  000012  000010           CLR     $TBIT           ;;CLEAR "T" BIT SWITCH
015536  005037  015146                   MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
015542  012737  015542  001106           MOV     @#4,-(SP)       ;;SAVE ERROR VECTOR
015550  013746  000004                   MOV     @#6,-(SP)
015554  013746  000006                   MOV     #67$,4          ;;SET UP TIME OUT VECTOR
015560  012737  015574  000004           TST     @SWR            ;;TRY TO REFERENCE HARDWARE SWR
015566  005777  163344                   BR      68$             ;;BRANCH IF NO TIMEOUT TRAP OCCURS
015572  000407                  67$:    MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
015574  012737  000176  001136           MOV     #DISPREG,DISPLAY ;;POINT TO SOFTWARE DISPLAY REG
015602  012737  000174  001140           CMP     (SP)+,(SP)+     ;;RESTORE STACK
015610  022626                  68$:    MOV     (SP)+,@#6       ;;RESTORE ERROR VECTOR
015612  012637  000006                   MOV     (SP)+,@#4
015616  012637  000004                   TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
015622  104400  030550                   TYPE,   M1200E          ;INDICATE "ENTERING ERROR FUNCTION
015626  104400  031333                                           ;TESTING OF AN M-1200"
015632                                                          ;CARD READER IS M-1200
015632  005037  001266                   CLR     CD1000          ;CARD READER IS M-1200
015636  000137  016134                   JMP     ER12CD
015642                          ERCD11:
015642  012706  001100                   MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
015646  005026                          CLR     (R6)+           ;;CLEAR MEMORY LOCATION
015650  022706  001126                   CMP     #$BDDAT,R6      ;;DONE?
015654  001374                          BNE     .-6             ;;LOOP BACK IF NO
015656  012706  001100                   MOV     #STACK,SP       ;;SETUP THE STACK POINTER
015662  012737  026326  000020           MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
015670  012737  000340  000022           MOV     #340,@#IOTVEC+2 ;;LEVEL 7
```

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3030  015676  012737  026152  000030          MOV     #SERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
3031  015704  012737  000340  000032          MOV     #340,@#EMTVEC+2 ;;LEVEL 7
3032  015712  012737  027374  000034          MOV     #STRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
3033  015720  012737  000340  000036          MOV     #340,@#TRAPVEC+2;LEVEL 7
3034  015726  012737  027430  000024          MOV     #SPWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
3035  015734  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;LEVEL 7
3036  015742  013737  014774  014766          MOV     $ENDCT,$EOPCT   ;;SETUP END-OF-PROGRAM COUNTER
3037  015750  005037  001220                  CLR     $TIMES          ;;INITIALIZE NUMBER OF ITERATIONS
3038  015754  012737  015140  000014          MOV     #$RTRN,@#TBITVEC ;;SET "T" BIT VECTOR TO $RTRN
3039  015762  012737  000340  000016          MOV     #340,@#TBITVEC+2 ;;LEVEL 7
3040  015770  012737  000002  015140          MOV     #RTI,$RTRN      ;;SET $RTRN TO A RTI
3041  015776  012737  016024  000010          MOV     #65$,@#RESVEC   ;;TRY TO DO A RTT
3042  016004  005046                          CLR     -(SP)           ;;DUMMY PS
3043  016006  012746  016014                  MOV     #64$,-(SP)      ;;AND PC
3044  016012  000006                          RTT                     ;;TRY THE RTT
3045  016014  012737  000006  015140  64$:    MOV     #RTT,$RTRN      ;;RTT IS LEGAL--SET $RTRN TO A RTT
3046  016022  000402                          BR      66$
3047  016024  062706  000010          65$:    ADD     #10,SP          ;;RTT ILLEGAL--CLEAN OFF THE STACK
3048  016030  012737  000012  000010  66$:    MOV     #RESVEC+2,@#RESVEC ;;RESTORE TRAP CATCHER
3049  016036  005037  015146                  CLR     $TBIT           ;;CLEAR "T" BIT SWITCH
3050  016042  012737  016042  001106          MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
3051  016050  013746  000004                  MOV     @#4,-(SP)       ;;SAVE ERROR VECTOR
3052  016054  013746  000006                  MOV     @#6,-(SP)
3053  016060  012737  016074  000004          MOV     #67$,4          ;;SET UP TIME OUT VECTOR
3054  016066  005777  163044                  TST     @SWR            ;;TRY TO REFERENCE HARDWARE SWR
3055  016072  000407                          BR      68$             ;;BRANCH IF NO TIMEOUT TRAP OCCURS
3056  016074  012737  000176  001136  67$:    MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
3057  016102  012737  000174  001140          MOV     #DISPREG,DISPLAY ;;POINT TO SOFTWARE DISPLAY REG
3058  016110  022626                          CMP     (SP)+,(SP)+     ;;RESTORE STACK
3059  016112  012637  000006          68$:    MOV     (SP)+,@#6       ;;RESTORE ERROR VECTOR
3060  016116  012637  000004                  MOV     (SP)+,@#4
3061  016122  104400  031401                  TYPE,   M1000E          ;INDICATE "ENTERING ERROR FUNCTION
                                                                      ;TESTING OF AN M1000/M200"
3062
3063  016126  012737  177777  001266          MOV     #177777, CD1000 ;CARD READER IS M1000/M200
3064  016134  012737  016146  027576  ER12CD: MOV     #ERCD12,RETURN  ;SAVE RETURN POINT FOR THIS
                                                                      ;SECTION FOR POWER FAILURE RETURN
3065
3066  016142  004737  045366                  JSR     PC,SETUP        ;INITIALIZE REGISTERS
3067  016146  104400  030556          ERCD12: TYPE,   STMES   ;TYPE MAINDEC TITLE & REV. LEVEL
3068
3069                                  ;*****************************************************************
3070                                  ;*TEST 33       TEST DATA LATE
3071                                  ;*****************************************************************
3072  016152  000004                  TST33:  SCOPE
3073                                  ;HALT SHOULD CAUSE DATA LATE ERROR (BIT 10)
3074                                  ;SHOULD SET ERROR (BIT 15)
3075  016154  004737  025744                  JSR     PC,     INIT    ;INITIALIZE STATUS REGISTER
3076  016160  104400  030553                  TYPE,   CRLF
3077  016164  104400  035645                  TYPE,   MSG32           ;TST33 DATA LATE TEST
3078  016170  104400  033605                  TYPE,   MSG22           ;"WHEN PRINTING STOPS PUT HALT AND
                                                                      ;SINGLE BUS CYCLE DOWN, AND HIT 'CONTINUE' ON THE
3079                                                                  ;CONSOLE UNTIL ONE CARD IS READ
3080                                                                  ;THEN PUT UP THE TWO SWITCHES AND HIT
3081                                                                  ;'CONTINUE' ON THE CONSOLE
3082
3083  016174  104400  030550                  TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
```

```
3084  016200  012714  177701          MOV     #-77,   @CDC    ;SET UP COLUMN COUNT
3085  016204  012715  045442          MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
3086  016210  000000                  HALT                    ;
3087  016212  005213                  INC     @CDS            ;START READING
3088  016214  105713                  TSTB    @CDS            ;CHECK FOR CONTROLLER READY
3089  016216  001001                  BNE     1$              ;BRANCH IF SET OK
3090  016220  104023                  ERROR +23               ;CONTROLLER READY FAILED TO SET
3091
3092  016222  005713          1$:     TST     @CDS            ;CHECK FOR ERROR ( BIT 15)
3093  016224  001001                  BNE     2$              ;BRANCH IF SET OK
3094  016226  104026                  ERROR +26               ;ERROR BIT 15 NOT SET
3095
3096  016230  032713  002000  2$:     BIT     #2000,  @CDS    ;CHECK FOR DATA LATE ERROR (BIT 10)
3097  016234  001001                  BNE     3$              ;BRANCH IF SET OK
3098  016236  104042                  ERROR +42               ;DATA LATE BIT 10 NOT SET
3099
3100  016240  032713  075577  3$:     BIT     #075577,@CDS   ;CHECK FOR ANY OTHER BITS
3101  016244  001401                  BEQ     4$              ;BRANCH IF OK
3102  016246  104004                  ERROR +4                ;EXTRA BITS SET IN STATUS WORD
3103
3104  016250                  4$:
                ;*****************************************************************
                ;*TEST 34       TEST ERROR AND OFF LINE BITS
                ;*****************************************************************
3108  016250  000004          TST34:  SCOPE
                ;THE CARD READER GOING OFF-LINE SHOULD SET ERROR (BIT 15)
                ;AND OFF-LINE (BIT 12)
                ;GOING BACK ON LINE SHOULD SET "TRANSITION TO ON-LINE" (BIT 3)
3112  016252  004737  025744          JSR     PC,INIT         ;INITIALIZE STATUS REGISTER
3113  016256  104400  035675          TYPE,   MSG33           ;TST34 OFF-LINE TEST
3114  016262  104400  031706          TYPE,   MSG3            ;"PRESS CARD READER 'STOP'"
3115  016266  104400  031632          TYPE,   MSG2            ;"THEN HIT 'CONTINUE' ON THE CONSOLE"
3116  016272  104400  030550          TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
3117  016276  000000                  HALT
3118  016300  032713  010000          BIT     #10000,@CDS     ;CHECK BIT 12
3119  016304  001001                  BNE     1$              ;BRANCH IF SET
3120  016306  104043                  ERROR +43               ;OFF-LINE (BIT 12) WASN'T SET
3121
3122  016310  005713          1$:     TST     @CDS            ;CHECK BIT 15
3123  016312  100401                  BMI     2$              ;BRANCH IF SET
3124  016314  104026                  ERROR +26               ;ERROR (BIT 15) WASN'T SET
3125
3126  016316  031327  067577  2$:     BIT     @CDS,#067577    ;CHECK FOR EXTRA BITS
3127  016322  001401                  BEQ     3$              ;BRANCH IF OK
3128  016324  104015                  ERROR +15               ;STATUS WORD ERROR
3129
3130  016326  104400  031576  3$:     TYPE,   MSG1            ;"PRESS CARD READER 'RESET'";
3131  016332  104400  031632          TYPE,   MSG2            ;"THEN HIT 'CONTINUE' ON THE CONSOLE"
3132  016336  104400  030550          TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
3133  016342  000000                  HALT
3134
3135  016344  032713  000010          BIT     #10,    @CDS    ;CHECK FOR TRANSIION TO ON-LINE(BIT 3)
3136  016350  001001                  BNE     4$              ;BRANCH IF SET OK
3137  016352  104036                  ERROR +36               ;TRANSITION TO ON-LINE FAILED TO SET
```

```
                                                ;CHECK FOR OFF-LINE
016354  032713  010000          4$:   BIT   #10000, @CDS
016360  001401                      BEQ   5$      ;BRANCH IF OK
016362  104044                      ERROR +44             ;OFF-LINE STILL SET
                                                ;CHECK ERROR (BIT 15)
016364  005713                5$:   TST   @CDS
016366  100401                      BMI   6$      ;BRANCH IF STILL SET
016370  104026                      ERROR +26             ;ERROR BIT 15 CLEARED
                                                ;CHECK FOR EXTRA BITS
016372  032713  077567        6$:   BIT   #077567,@CDS
016376  001401                      BEQ   7$      ;BRANCH IF OK
016400  104015                      ERROR +15             ;EXTRA STATUS BITS SET

016402                          7$:
                        ;*****************************************************************
016402  000004          TST35:  SCOPE
                        ;TRYING TO READ WHEN CARD READER IS OFF-LINE SHOULD CAUSE AN INTERRUPT
                        ;CHECK THAT AN INTERRUPT OCCURS WHEN THE CARD READER COMES ON LINE
016404  004737  025744          JSR   PC,INIT         ;INITIALIZE STATUS REGISTER
016410  012712  016652          MOV   #TINTC, @ADINT  ;LOAD RETURN POINTER
                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
016414  005046                  CLR   -(SP)           ;;
016416  013746  000034          MOV   34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
016422  012737  016432  000034  MOV   #64$,34        ;;SETUP NEW TRAP VECTOT
016430  104400                  TRAP                  ;;PUSH OLD PSW AN PCON STACK
016432  016666  000002  000006  64$:  MOV   2(SP),6(SP)  ;;
016440  012716  016446          MOV   #65$,(SP)               ;;REPLACE OLD PC WITH NEW
016444  000002                  RTI                   ;;RESTORE PSW
016446  012637  000034          65$:  MOV   (SP)+,34          ;;RESTORE OLD TRAP  VECTOR
016452  012637  001214          MOV   (SP)+,$TMP6
016456  052737  000340  001214  BIS   #340,$TMP6
016464  013746  001214          MOV   $TMP6,-(SP)     ;;PUT NEW PS ON STACK
016470  012746  016476          MOV   #66$,-(SP)      ;;PUT NEW PC ON  STACK
016474  000002                  RTI                   ;; POP NEW PC AND PS
016476                          66$:
                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
016476  005046                  CLR   -(SP)           ;;
016500  013746  000034          MOV   34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
016504  012737  016514  000034  MOV   #67$,34        ;;SETUP NEW TRAP VECTOT
016512  104400                  TRAP                  ;;PUSH OLD PSW AN PCON STACK
016514  016666  000002  000006  67$:  MOV   2(SP),6(SP)  ;;
016522  012716  016530          MOV   #68$,(SP)               ;;REPLACE OLD PC WITH NEW
016526  000002                  RTI                   ;;RESTORE PSW
016530  012637  000034          68$:  MOV   (SP)+,34          ;;RESTORE OLD TRAP  VECTOR
016534  012662  000002          MOV   (SP)+,2(ADINT)
                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
016540  005046                  CLR   -(SP)           ;;
016542  013746  000034          MOV   34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
016546  012737  016556  000034  MOV   #69$,34        ;;SETUP NEW TRAP VECTOT
016554  104400                  TRAP                  ;;PUSH OLD PSW AN PCON STACK
016556  016666  000002  000006  69$:  MOV   2(SP),6(SP)  ;;
016564  012716  016572          MOV   #70$,(SP)               ;;REPLACE OLD PC WITH NEW
016570  000002                  RTI                   ;;RESTORE PSW
016572  012637  000034          70$:  MOV   (SP)+,34          ;;RESTORE OLD TRAP  VECTOR
```

```
3192  016576  012637  001214          MOV     (SP)+,$TMP6
3193  016602  042737  000340  001214  BIC     #340,$TMP6
3194  016610  013746  001214          MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3195  016614  012746  016622          MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
3196  016620  000002                  RTI                     ;; POP NEW PC AND PS
3197  016622                  71$:
3198  016622  012713  000100          MOV     #100,   @CDS    ;SET INTERRUPT ENABLE
3199  016626  104400  035724          TYPE,   MSG34           ;TST35 SPECIAL INT. COND. TEST
3200  016632  104400  031706          TYPE,   MSG3            ;"PRESS CARD READER 'STOP'"
3201  016636  104400  030550          TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
3202  016642  032713  010000  TLOPC:  BIT     #10000, @CDS    ;WAIT FOR OFF-LINE TO SET
3203  016646  001775                  BEQ     TLOPC
3204  016650  000402                  BR      CONTC           ;SKIP INTERRUPT HANDLER
3205
3206  016652  104021  TINTC:  ERROR +21                        ;'STOP' SHOULDN'T CAUSE AN INTERRUPT
3207  016654  000002                  RTI                     ;RETURN FROM THE INTERRUPT
3208
3209  016656  105713  CONTC:  TSTB    @CDS                    ;CHECK CONTROLLER READY BIT 7
3210  016660  100401          BMI     1$                      ;BRANCH IF OK
3211  016662  104023          ERROR +23                       ;CU READY DIDN'T SET YET
3212
3213  016664  005713  1$:     TST     @CDS                    ;CHECK ERROR BIT
3214  016666  100401          BMI     2$                      ;BRANCH IF SET
3215  016670  104026          ERROR +26                       ;ERROR (BIT 15) NOT SET
3216
3217  016672  032713  067477  2$:     BIT     #067477,@CDS   ;CHECK FOR EXTRA BITS
3218  016676  001401          BEQ     3$                      ;BRANCH IF OK
3219  016700  104004          ERROR +4                        ;STATUS WORD ERROR
3220
3221  016702  012712  017120  3$:     MOV     #TINTCA,@ADINT  ;LOAD RETURN POINTER
3222                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
3223  016706  005046          CLR     -(SP)                   ;;
3224  016710  013746  000034  MOV     34,-(SP)                ;;SAVE CURRENT TRAP VECTOR
3225  016714  012737  016724  000034  MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
3226  016722  104400          TRAP                            ;;PUSH OLD PSW AN PCON STACK
3227  016724  016666  000002  000006  64$:  MOV     2(SP),6(SP)  ;;
3228  016732  012716  016740          MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
3229  016736  000002                  RTI                     ;;RESTORE PSW
3230  016740  012637  000034  65$:     MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3231  016744  012637  001214          MOV     (SP)+,$TMP6
3232  016750  052737  000340  001214  BIS     #340,$TMP6
3233  016756  013746  001214          MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3234  016762  012746  016770          MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
3235  016766  000002                  RTI                     ;; POP NEW PC AND PS
3236  016770                  66$:
3237                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
3238  016770  005046          CLR     -(SP)                   ;;
3239  016772  013746  000034  MOV     34,-(SP)                ;;SAVE CURRENT TRAP VECTOR
3240  016776  012737  017006  000034  MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
3241  017004  104400          TRAP                            ;;PUSH OLD PSW AN PCON STACK
3242  017006  016666  000002  000006  67$:  MOV     2(SP),6(SP)  ;;
3243  017014  012716  017022          MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
3244  017020  000002                  RTI                     ;;RESTORE PSW
3245  017022  012637  000034  68$:     MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
```

```
3246  017026  012662  000002                    MOV     (SP)+,2(ADINT)
3247                                            ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
3248  017032  005046                            CLR     -(SP)           ;;
3249  017034  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3250  017040  012737  017050  000034            MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
3251  017046  104400                            TRAP                    ;;PUSH OLD PSW AN PCON STACK
3252  017050  016666  000002  000006  69$:      MOV     2(SP),6(SP)     ;;
3253  017056  012716  017064                    MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
3254  017062  000002                            RTI                     ;;RESTORE PSW
3255  017064  012637  000034          70$:      MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3256  017070  012637  001214                    MOV     (SP)+,$TMP6
3257  017074  042737  000340  001214            BIC     #340,$TMP6
3258  017102  013746  001214                    MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3259  017106  012746  017114                    MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
3260  017112  000002                            RTI                     ;; POP NEW PC AND PS
3261  017114                          71$:
3262  017114  005213                            INC     @CDS            ;TRY TO READ A CARD
3263  017116  000777                            BR      .               ;WAIT FOR THE INTERRUPT
3264
3265  017120  022626                  TINTCA:   CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
3266  017122  105713                            TSTB    @CDS            ;CHECK CONTROLLER READY BIT 7
3267  017124  100401                            BMI     1$              ;BRANCH IF OK
3268  017126  104023                            ERROR +23                       ;CU READY DIDN'T SET YET
3269
3270  017130  032713  010000          1$:       BIT     #10000, @CDS    ;CHECK FOR OFF-LINE BIT 12
3271  017134  001001                            BNE     2$              ;BRANCH IF OK
3272  017136  104043                            ERROR +43                       ;OFF-LINE BIT 12 NOT SET
3273
3274  017140  005713                  2$:       TST     @CDS            ;CHECK ERROR BIT
3275  017142  100401                            BMI     3$              ;BRANCH IF SET
3276  017144  104026                            ERROR +26                       ;ERROR (BIT 15) NOT SET
3277
3278  017146  032713  067477          3$:       BIT     #067477,@CDS    ;CHECK FOR EXTRA BITS
3279  017152  001401                            BEQ     4$              ;BRANCH IF OK
3280  017154  104004                            ERROR +4                        ;STATUS WORD ERROR
3281
3282  017156  012712  017402          4$:       MOV     #TINTCB,@ADINT  ;LOAD RETURN POINTER
3283                                            ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
3284  017162  005046                            CLR     -(SP)           ;;
3285  017164  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3286  017170  012737  017200  000034            MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
3287  017176  104400                            TRAP                    ;;PUSH OLD PSW AN PCON STACK
3288  017200  016666  000002  000006  64$:      MOV     2(SP),6(SP)     ;;
3289  017206  012716  017214                    MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
3290  017212  000002                            RTI                     ;;RESTORE PSW
3291  017214  012637  000034          65$:      MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3292  017220  012637  001214                    MOV     (SP)+,$TMP6
3293  017224  052737  000340  001214            BIS     #340,$TMP6
3294  017232  013746  001214                    MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3295  017236  012746  017244                    MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
3296  017242  000002                            RTI                     ;; POP NEW PC AND PS
3297  017244                          66$:
3298                                            ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
3299  017244  005046                            CLR     -(SP)           ;;
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3300  017246  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3301  017252  012737  017262  000034            MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
3302  017260  104400                            TRAP                    ;;PUSH OLD PSW AN PCON STACK
3303  017262  016666  000002  000006  67$:     MOV     2(SP),6(SP)     ;;
3304  017270  012716  017276                    MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
3305  017274  000002                            RTI                     ;;RESTORE PSW
3306  017276  012637  000034          68$:     MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3307  017302  012662  000002                    MOV     (SP)+,2(ADINT)
3308                                            ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
3309  017306  005046                            CLR     -(SP)           ;;
3310  017310  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3311  017314  012737  017324  000034            MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
3312  017322  104400                            TRAP                    ;;PUSH OLD PSW AN PCON STACK
3313  017324  016666  000002  000006  69$:     MOV     2(SP),6(SP)     ;;
3314  017332  012716  017340                    MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
3315  017336  000002                            RTI                     ;;RESTORE PSW
3316  017340  012637  000034          70$:     MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3317  017344  012637  001214                    MOV     (SP)+,$TMP6
3318  017350  042737  000340  001214            BIC     #340,$TMP6
3319  017356  013746  001214                    MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3320  017362  012746  017370                    MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
3321  017366  000002                            RTI                     ;; POP NEW PC AND PS
3322  017370                          71$:
3323  017370  104400  031576                    TYPE,   MSG1            ;"PRESS CARD READER 'RESET'"
3324  017374  104400  030550                    TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
3325  017400  000777                            BR      .               ;WAIT FOR THE INTERRUPT
3326
3327  017402  022626          TINTCB: CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
3328  017404  032713  000010          BIT     #10,    @CDS    ;CHECK FOR TRANSITION TO ON-LINE(BIT 3)
3329  017410  001001                  BNE     1$              ;BRANCH IF SET OK
3330  017412  104036                  ERROR +36                       ;TRANSITION TO ON-LINE FAILED TO SET
3331
3332  017414  032713  010000  1$:     BIT     #10000, @CDS    ;CHECK FOR OFF-LINE
3333  017420  001401                  BEQ     2$              ;BRANCH IF OK
3334  017422  104044                  ERROR +44                       ;OFF-LINE STILL SET
3335
3336  017424  005713  2$:     TST     @CDS            ;CHECK ERROR (BIT 15)
3337  017426  100401                  BMI     3$              ;BRANCH IF STILL SET
3338  017430  104026                  ERROR +26                       ;ERROR BIT 15 CLEARED
3339
3340  017432  032713  077467  3$:     BIT     #077467,@CDS   ;CHECK FOR EXTRA BITS
3341  017436  001401                  BEQ     4$              ;BRANCH IF OK
3342  017440  104015                  ERROR +15                       ;EXTRA STATUS BITS SET
3343
3344  017442          4$:
3345                  ;*****************************************************************
3346                  ;*TEST 36       TEST INPUT HOPPER EMPTY
3347                  ;*****************************************************************
3348  017442  000004  TST36:  SCOPE
3349                  ;INPUT HOPPER EMPTY SHOULD SET SPECIAL CONDITION
3350                  ;CHECK THAT INTERRUPTS OCCUR WHEN THE CARD READER COMES ON LINE
3351  017444  004737  025744          JSR     PC,INIT         ;INITIALIZE STATUS REGISTER
3352  017450  104400  035765          TYPE,   MSG35           ;TST36 HOPPER EMPTY TEST
3353  017454  104400  031774          TYPE,   MSG5            ;"REMOVE ALL CARDS FROM THE INPUT HOPPER"
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3354  017460  104400  031632                  TYPE,   MSG2            ;"THEN HIT 'CONTINUE' ON THE CONSOLE"
3355  017464  104400  030550                  TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
3356  017470  000000                          HALT
3357  017472  032713  010000                  BIT     #10000,@CDS     ;CHECK BIT12
3358  017476  001001                          BNE     1$              ;BRANCH IF SET
3359  017500  104043                          ERROR +43                       ;OFF-LINE (BIT 12) WASN'T SET
3360
3361  017502  005713                  1$:     TST     @CDS            ;CHECK ERROR BIT
3362  017504  100401                          BMI     2$              ;BRANCH IF SET
3363  017506  104026                          ERROR +26                       ;ERROR (BIT 15) NOT SET
3364
3365  017510  032713  040000          2$:     BIT     #40000, @CDS    ;CHECK FOR CARD READER ERROR
3366  017514  001001                          BNE     3$              ;BRANCH IF SET
3367  017516  104035                          ERROR +35                       ;CARD READER ERROR BIT 14 NOT SET
3368
3369  017520  032713  027573          3$:     BIT     #027573,@CDS   ;CHECK FOR EXTRA BITS
3370  017524  001401                          BEQ     4$              ;BRANCH IF OK
3371  017526  104015                          ERROR +15                       ;STATUS WORD ERROR
3372
3373  017530  012712  017764          4$:     MOV     #TINTD, @ADINT  ;LOAD RETURN POINTER
3374                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
3375  017534  005046                          CLR     -(SP)           ;;
3376  017536  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3377  017542  012737  017552  000034          MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
3378  017550  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
3379  017552  016666  000002  000006  64$:    MOV     2(SP),6(SP)     ;;
3380  017560  012716  017566                  MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
3381  017564  000002                          RTI                     ;;RESTORE PSW
3382  017566  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3383  017572  012637  001214                  MOV     (SP)+,$TMP6
3384  017576  052737  000340  001214          BIS     #340,$TMP6
3385  017604  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3386  017610  012746  017616                  MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
3387  017614  000002                          RTI                     ;; POP NEW PC AND PS
3388  017616                          66$:
3389                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
3390  017616  005046                          CLR     -(SP)           ;;
3391  017620  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3392  017624  012737  017634  000034          MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
3393  017632  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
3394  017634  016666  000002  000006  67$:    MOV     2(SP),6(SP)     ;;
3395  017642  012716  017650                  MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
3396  017646  000002                          RTI                     ;;RESTORE PSW
3397  017650  012637  000034          68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3398  017654  012662  000002                  MOV     (SP)+,2(ADINT)
3399                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
3400  017660  005046                          CLR     -(SP)           ;;
3401  017662  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3402  017666  012737  017676  000034          MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
3403  017674  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
3404  017676  016666  000002  000006  69$:    MOV     2(SP),6(SP)     ;;
3405  017704  012716  017712                  MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
3406  017710  000002                          RTI                     ;;RESTORE PSW
3407  017712  012637  000034          70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
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3408  017716  012637  001214                    MOV     (SP)+,$TMP6
3409  017722  042737  000340  001214            BIC     #340,$TMP6
3410  017730  013746  001214                    MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3411  017734  012746  017742                    MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
3412  017740  000002                            RTI                     ;; POP NEW PC AND PS
3413  017742                          71$:
3414  017742  012713  000100                    MOV     #100,   @CDS    ;SET INTERRUPT ENABLE
3415  017746  104400  032045                    TYPE,   MSG6            ;"RESTORE CARDS TO THE INPUT HOPPER"
3416  017752  104400  031576                    TYPE,   MSG1            ;"PRESS CARD READER 'RESET'"
3417  017756  104400  030550                    TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
3418  017762  000777                            BR      .               ;WAIT FOR THE INTERRUPT
3419
3420  017764  022626                  TINTD:  CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
3421  017766  012712  020214                    MOV     #TINTDA,@ADINT  ;LOAD RETURN POINTER
3422                                            ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
3423  017772  005046                            CLR     -(SP)           ;;
3424  017774  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3425  020000  012737  020010  000034            MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
3426  020006  104400                            TRAP                    ;;PUSH OLD PSW AN PCON STACK
3427  020010  016666  000002  000006  64$:     MOV     2(SP),6(SP)     ;;
3428  020016  012716  020024                    MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
3429  020022  000002                            RTI                     ;;RESTORE PSW
3430  020024  012637  000034          65$:     MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3431  020030  012637  001214                    MOV     (SP)+,$TMP6
3432  020034  052737  000340  001214            BIS     #340,$TMP6
3433  020042  013746  001214                    MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3434  020046  012746  020054                    MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
3435  020052  000002                            RTI                     ;; POP NEW PC AND PS
3436  020054                          66$:
3437                                            ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
3438  020054  005046                            CLR     -(SP)           ;;
3439  020056  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3440  020062  012737  020072  000034            MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
3441  020070  104400                            TRAP                    ;;PUSH OLD PSW AN PCON STACK
3442  020072  016666  000002  000006  67$:     MOV     2(SP),6(SP)     ;;
3443  020100  012716  020106                    MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
3444  020104  000002                            RTI                     ;;RESTORE PSW
3445  020106  012637  000034          68$:     MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3446  020112  012662  000002                    MOV     (SP)+,2(ADINT)
3447                                            ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
3448  020116  005046                            CLR     -(SP)           ;;
3449  020120  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3450  020124  012737  020134  000034            MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
3451  020132  104400                            TRAP                    ;;PUSH OLD PSW AN PCON STACK
3452  020134  016666  000002  000006  69$:     MOV     2(SP),6(SP)     ;;
3453  020142  012716  020150                    MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
3454  020146  000002                            RTI                     ;;RESTORE PSW
3455  020150  012637  000034          70$:     MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3456  020154  012637  001214                    MOV     (SP)+,$TMP6
3457  020160  042737  000340  001214            BIC     #340,$TMP6
3458  020166  013746  001214                    MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3459  020172  012746  020200                    MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
3460  020176  000002                            RTI                     ;; POP NEW PC AND PS
3461  020200                          71$:
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3462  020200  012714  177701                MOV     #-77,   @CDC    ;SET UP COLUMN COUNT
3463  020204  012715  045442                MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
3464  020210  005213                       INC     @CDS            ;START READING
3465  020212  000777                       BR      .               ;WAIT FOR AN INTERRUPT
3466
3467  020214  022626              TINTDA:  CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
3468  020216  022713  000300               CMP     #000300,@CDS    ;CHECH THE CARD READER STATUS
3469  020222  001401                       BEQ     1$              ;BRANCH IF OK
3470  020224  104004                       ERROR +4                        ;CARD READER STATUS ERROR
3471
3472  020226                      1$:
3473                              ;*****************************************************************
3474                              ;*TEST 37       TEST OUTPUT STACKER FULL
3475                              ;*****************************************************************
3476  020226  000004              TST37:  SCOPE
3477                              ;OUTPUT STACKER FULL SHOULD SET BITS 15, 14, 12, 7
3478  020230  004737  025744              JSR     PC,INIT         ;INITIALIZE STATUS REGISTER
3479  020234  104400  036020              TYPE,   MSG36           ;TST37 STACKER FULL TEST
3480  020240  104400  032111              TYPE,   MSG7            ;"PULL OUTPUT STACKER PRESSURE ARM
3481                                                              ;ALL THE WAY DOWN"
3482  020244  104400  031632              TYPE,   MSG2            ;"THEN HIT 'CONTINUE' ON THE CONSOLE"
3483  020250  104400  030550              TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
3484  020254  000000                       HALT
3485  020256  032713  010000              BIT     #10000,@CDS     ;CHECK OFF-LINE BIT12
3486  020262  001001                       BNE     1$              ;BRANCH IF SET
3487  020264  104043                       ERROR +43                       ;OFF-LINE (BIT 12) WASN'T SET
3488
3489  020266  005713              1$:      TST     @CDS            ;CHECK ERROR BIT 15
3490  020270  100401                       BMI     2$              ;BRANCH IF SET
3491  020272  104026                       ERROR +26                       ;ERROR BIT 15 NOT SET
3492
3493  020274  032713  040000      2$:      BIT     #40000, @CDS    ;CHECK FOR CARD READER ERROR
3494  020300  001001                       BNE     3$              ;BRANCH IF SET
3495  020302  104035                       ERROR +35                       ;CARD READER ERROR BIT 14 NOT SET
3496
3497  020304  032713  027577      3$:      BIT     #027577,@CDS    ;CHECK FOR EXTRA BITS
3498  020310  001401                       BEQ     4$              ;BRANCH IF OK
3499  020312  104015                       ERROR +15                       ;STATUS WORD ERROR
3500
3501  020314  012712  020544      4$:      MOV     #TINTE, @ADINT  ;LOAD RETURN POINTER
3502                                      ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
3503  020320  005046                       CLR     -(SP)           ;;
3504  020322  013746  000034              MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3505  020326  012737  020336  000034       MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
3506  020334  104400                       TRAP                    ;;PUSH OLD PSW AN PCON STACK
3507  020336  016666  000002  000006 64$:  MOV     2(SP),6(SP)     ;;
3508  020344  012716  020352              MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
3509  020350  000002                       RTI                     ;;RESTORE PSW
3510  020352  012637  000034      65$:     MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3511  020356  012637  001214              MOV     (SP)+,$TMP6
3512  020362  052737  000340  001214       BIS     #340,$TMP6
3513  020370  013746  001214              MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3514  020374  012746  020402              MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
3515  020400  000002                       RTI                     ;; POP NEW PC AND PS
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3516  020402                                66$:
3517                                              ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
3518  020402  005046                              CLR     -(SP)           ;;
3519  020404  013746  000034                      MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3520  020410  012737  020420  000034              MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
3521  020416  104400                              TRAP                    ;;PUSH OLD PSW AN PCON STACK
3522  020420  016666  000002  000006  67$:       MOV     2(SP),6(SP)     ;;
3523  020426  012716  020434                      MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
3524  020432  000002                              RTI                     ;;RESTORE PSW
3525  020434  012637  000034          68$:       MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3526  020440  012662  000002                      MOV     (SP)+,2(ADINT)
3527                                              ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
3528  020444  005046                              CLR     -(SP)           ;;
3529  020446  013746  000034                      MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3530  020452  012737  020462  000034              MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
3531  020460  104400                              TRAP                    ;;PUSH OLD PSW AN PCON STACK
3532  020462  016666  000002  000006  69$:       MOV     2(SP),6(SP)     ;;
3533  020470  012716  020476                      MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
3534  020474  000002                              RTI                     ;;RESTORE PSW
3535  020476  012637  000034          70$:       MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3536  020502  012637  001214                      MOV     (SP)+,$TMP6
3537  020506  042737  000340  001214              BIC     #340,$TMP6
3538  020514  013746  001214                      MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3539  020520  012746  020526                      MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
3540  020524  000002                              RTI                     ;; POP NEW PC AND PS
3541  020526                          71$:
3542  020526  012713  000100                      MOV     #100,   @CDS    ;SET INTERRUPT ENABLE
3543  020532  104400  031576                      TYPE,   MSG1            ;"PRESS CARD READER 'RESET'"
3544  020536  104400  030550                      TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
3545  020542  000777                              BR      .               ;WAIT FOR THE INTERRUPT
3546
3547  020544  022626                  TINTE:      CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
3548  020546  012712  020774                      MOV     #TINTEA,@ADINT  ;LOAD RETURN POINTER
3549                                              ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
3550  020552  005046                              CLR     -(SP)           ;;
3551  020554  013746  000034                      MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3552  020560  012737  020570  000034              MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
3553  020566  104400                              TRAP                    ;;PUSH OLD PSW AN PCON STACK
3554  020570  016666  000002  000006  64$:       MOV     2(SP),6(SP)     ;;
3555  020576  012716  020604                      MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
3556  020602  000002                              RTI                     ;;RESTORE PSW
3557  020604  012637  000034          65$:       MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3558  020610  012637  001214                      MOV     (SP)+,$TMP6
3559  020614  052737  000340  001214              BIS     #340,$TMP6
3560  020622  013746  001214                      MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3561  020626  012746  020634                      MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
3562  020632  000002                              RTI                     ;; POP NEW PC AND PS
3563  020634                          66$:
3564                                              ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
3565  020634  005046                              CLR     -(SP)           ;;
3566  020636  013746  000034                      MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3567  020642  012737  020652  000034              MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
3568  020650  104400                              TRAP                    ;;PUSH OLD PSW AN PCON STACK
3569  020652  016666  000002  000006  67$:       MOV     2(SP),6(SP)     ;;
```

```
3570  020660  012716  020666                        MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
3571  020664  000002                                RTI                     ;;RESTORE PSW
3572  020666  012637  000034          68$:          MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3573  020672  012662  000002                        MOV     (SP)+,2(ADINT)
3574                                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
3575  020676  005046                                CLR     -(SP)           ;;
3576  020700  013746  000034                        MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3577  020704  012737  020714  000034                MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
3578  020712  104400                                TRAP                    ;;PUSH OLD PSW AN PCON STACK
3579  020714  016666  000002  000006  69$:          MOV     2(SP),6(SP)     ;;
3580  020722  012716  020730                        MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
3581  020726  000002                                RTI                     ;;RESTORE PSW
3582  020730  012637  000034          70$:          MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3583  020734  012637  001214                        MOV     (SP)+,$TMP6
3584  020740  042737  000340  001214                BIC     #340,$TMP6
3585  020746  013746  001214                        MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3586  020752  012746  020760                        MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
3587  020756  000002                                RTI                     ;; POP NEW PC AND PS
3588  020760                          71$:
3589  020760  012714  177701                        MOV     #-77,   @CDC    ;SET UP COLUMN COUNT
3590  020764  012715  045442                        MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
3591  020770  005213                                INC     @CDS            ;START READING
3592  020772  000777                                BR      .               ;WAIT FOR AN INTERRUPT
3593
3594  020774  022626                  TINTEA:       CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
3595  020776  022713  000300                        CMP     #000300,@CDS    ;CHECH THE CARD READER STATUS
3596  021002  001401                                BEQ     1$              ;BRANCH IF OK
3597  021004  104004                                ERROR +4                        ;CARD READER STATUS ERROR
3598
3599  021006                          1$:
3600                                                ;*****************************************************************
3601                                                ;*TEST 40       TEST PICK CHECK ERROR
3602                                                ;*****************************************************************
3603  021006  000004                                TST40:  SCOPE
3604                                                ;A PICK CHECK ERROR SHOULD SET BIT 15, BIT 14, AND BIT 12
3605                                                ;THIS ERROR OCCURS WHEN THE FEED MECHANISM FAILS TO DELIVER A CARD TO
3606                                                ;THE READ STATION WITHIN 400 MS.
3607                                                ;CAN ALSO BE FORCED BY FOLDING A CARD IN HALF
3608                                                ;AND PLACING IT INTO CARD READER 'INPUT HOPPER'
3609  021010  004737  025744                        JSR     PC,INIT
3610  021014  104400  036053                        TYPE,   MSG37           ;TST40 PICK CHECK TEST
3611  021020  104400  031774                        TYPE,   MSG5            ;"REMOVE ALL CARDS FROM THE INPUT HOPPER"
3612  021024  104400  031632                        TYPE,   MSG2            ;"THEN HIT 'CONTINUE' ON THE CONSOLE"
3613  021030  104400  032270                        TYPE,   MSG8            ;"HOLD DOWN THE SWITCH UNDER THE CAP
3614                                                                        ;OF THE INPUT HOPPER"
3615  021034  104400  031576                        TYPE,   MSG1            ;"PRESS CARD READER 'RESET'"
3616  021040  104400  030550                        TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
3617  021044  000000                                HALT
3618  021046  032713  010000                        BIT     #10000, @CDS    ;CHECK FOR OFF-LINE
3619  021052  001001                                BNE     1$              ;BRANCH IF SET
3620  021054  104043                                ERROR +43                       ;OFF LINE NOT SET AFTER "CONTINUE"
3621
3622  021056  032713  000010          1$:           BIT     #10,    @CDS    ;CHECK FOR "TRANSITION TO ON LINE"
3623  021062  001775                                BEQ     1$              ;WAIT FOR IT
```

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3624  021064  022713  140210              CMP     #140210,@CDS    ;CHECK FOR CORRECT STATUS BITS
3625  021070  001401                      BEQ     2$              ;BRANCH IF OK
3626  021072  104004                      ERROR +4                        ;STATUS NOT EQUAL TO 140210
3627
3628  021074  012714  177701      2$:     MOV     #-77,   @CDC    ;SET UP COLUMN COUNT
3629  021100  012715  045442              MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
3630  021104  005213                      INC     @CDS            ;READ
3631  021106  105713              3$:     TSTB    @CDS            ;CHECK CONTROLLER READY
3632  021110  100376                      BPL     3$              ;WAIT FOR CONTROLLER READY
3633  021112  032713  010000              BIT     #10000,@CDS     ;CHECK BIT12
3634  021116  001001                      BNE     4$              ;BRANCH IF SET
3635  021120  104043                      ERROR +43                       ;OFF-LINE (BIT 12) WASN'T SET
3636
3637  021122  005713              4$:     TST     @CDS            ;CHECK SPECIAL CONDITION BIT
3638  021124  100401                      BMI     5$              ;BRANCH IF SET
3639  021126  104026                      ERROR +26                       ;SPECIAL CONDITION NOT SET
3640
3641  021130  032713  040000      5$:     BIT     #40000, @CDS    ;CHECK FOR CARD READER ERROR
3642  021134  001001                      BNE     6$              ;BRANCH IF SET
3643  021136  104035                      ERROR +35                       ;CARD READER ERROR BIT 14 NOT SET
3644
3645  021140  005777  160074      6$:     TST     @CDDB           ;TEST BIT15 OF STATUS REGISTER #2
3646  021144  100005                      BPL     7$              ;BRANCH IF NOT SET INDICATING
3647                                                              ;OLD CD11 CONTROLLER
3648  021146  032777  020000  160064      BIT     #20000,@CDDB    ;IS PICK CHECK INDICATOR SET?
3649  021154  001001                      BNE     7$              ;BRANCH IF SET
3650  021156  104045                      ERROR +45               ;PICK CHECK BIT13 NOT SET
3651
3652  021160  031327  027577      7$:     BIT     @CDS,#027577    ;CHECK FOR EXTRA BITS
3653  021164  001401                      BEQ     10$             ;BRANCH IF OK
3654  021166  104015                      ERROR +15                       ;STATUS WORD ERROR
3655
3656  021170  012712  021424      10$:    MOV     #TINTF, @ADINT  ;LOAD RETURN POINTER
3657                                      ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
3658  021174  005046                      CLR     -(SP)           ;;
3659  021176  013746  000034              MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3660  021202  012737  021212  000034      MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
3661  021210  104400                      TRAP                    ;;PUSH OLD PSW AN PCON STACK
3662  021212  016666  000002  000006  64$:MOV     2(SP),6(SP)     ;;
3663  021220  012716  021226              MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
3664  021224  000002                      RTI                     ;;RESTORE PSW
3665  021226  012637  000034      65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3666  021232  012637  001214              MOV     (SP)+,$TMP6
3667  021236  052737  000340  001214      BIS     #340,$TMP6
3668  021244  013746  001214              MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3669  021250  012746  021256              MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
3670  021254  000002                      RTI                     ;; POP NEW PC AND PS
3671  021256                      66$:
3672                                      ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
3673  021256  005046                      CLR     -(SP)           ;;
3674  021260  013746  000034              MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3675  021264  012737  021274  000034      MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
3676  021272  104400                      TRAP                    ;;PUSH OLD PSW AN PCON STACK
3677  021274  016666  000002  000006  67$:MOV     2(SP),6(SP)     ;;
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3678  021302  012716  021310                  MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
3679  021306  000002                          RTI                     ;;RESTORE PSW
3680  021310  012637  000034          68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3681  021314  012662  000002                  MOV     (SP)+,2(ADINT)
3682                                          .THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
3683  021320  005046                          CLR     -(SP)                   ;;
3684  021322  013746  000034                  MOV     34,-(SP)                ;;SAVE CURRENT TRAP VECTOR
3685  021326  012737  021336  000034          MOV     #69$,34                 ;;SETUP NEW TRAP VECTOT
3686  021334  104400                          TRAP                            ;;PUSH OLD PSW AN PCON STACK
3687  021336  016666  000002  000006  69$:    MOV     2(SP),6(SP)             ;;
3688  021344  012716  021352                  MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
3689  021350  000002                          RTI                     ;;RESTORE PSW
3690  021352  012637  000034          70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3691  021356  012637  001214                  MOV     (SP)+,$TMP6
3692  021362  042737  000340  001214          BIC     #340,$TMP6
3693  021370  013746  001214                  MOV     $TMP6,-(SP)             ;;PUT NEW PS ON STACK
3694  021374  012746  021402                  MOV     #71$,-(SP)              ;;PUT NEW PC ON  STACK
3695  021400  000002                          RTI                             ;; POP NEW PC AND PS
3696  021402                          71$:
3697  021402  012713  000100                  MOV     #100,   @CDS            ;SET INTERRUPT ENABLE
3698  021406  104400  032045                  TYPE,   MSG6                    ;"RESTORE CARDS TO THE INPUT HOPPER"
3699  021412  104400  031576                  TYPE,   MSG1                    ;"PRESS CARD READER 'RESET'"
3700  021416  104400  030550                  TYPE,   CRLF-3                  ;MOVE MESSAGE UP ON TTY
3701  021422  000777                          BR      .                       ;WAIT FOR THE INTERRUPT
3702
3703  021424  022626                  TINTF:  CMP     (SP)+,  (SP)+           ;RESTORE THE STACK
3704  021426  012712  021654                  MOV     #TINTFA,@ADINT          ;LOAD RETURN POINTER
3705                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
3706  021432  005046                          CLR     -(SP)                   ;;
3707  021434  013746  000034                  MOV     34,-(SP)                ;;SAVE CURRENT TRAP VECTOR
3708  021440  012737  021450  000034          MOV     #64$,34                 ;;SETUP NEW TRAP VECTOT
3709  021446  104400                          TRAP                            ;;PUSH OLD PSW AN PCON STACK
3710  021450  016666  000002  000006  64$:    MOV     2(SP),6(SP)             ;;
3711  021456  012716  021464                  MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
3712  021462  000002                          RTI                     ;;RESTORE PSW
3713  021464  012637  000034          65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3714  021470  012637  001214                  MOV     (SP)+,$TMP6
3715  021474  052737  000340  001214          BIS     #340,$TMP6
3716  021502  013746  001214                  MOV     $TMP6,-(SP)             ;;PUT NEW PS ON STACK
3717  021506  012746  021514                  MOV     #66$,-(SP)              ;;PUT NEW PC ON  STACK
3718  021512  000002                          RTI                             ;; POP NEW PC AND PS
3719  021514                          66$:
3720                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
3721  021514  005046                          CLR     -(SP)                   ;;
3722  021516  013746  000034                  MOV     34,-(SP)                ;;SAVE CURRENT TRAP VECTOR
3723  021522  012737  021532  000034          MOV     #67$,34                 ;;SETUP NEW TRAP VECTOT
3724  021530  104400                          TRAP                            ;;PUSH OLD PSW AN PCON STACK
3725  021532  016666  000002  000006  67$:    MOV     2(SP),6(SP)             ;;
3726  021540  012716  021546                  MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
3727  021544  000002                          RTI                     ;;RESTORE PSW
3728  021546  012637  000034          68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3729  021552  012662  000002                  MOV     (SP)+,2(ADINT)
3730                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
3731  021556  005046                          CLR     -(SP)                   ;;
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 3732  021560  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
 3733  021564  012737  021574  000034            MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
 3734  021572  104400                            TRAP                    ;;PUSH OLD PSW AN PCON STACK
 3735  021574  016666  000002  000006  69$:     MOV     2(SP),6(SP)     ;;
 3736  021602  012716  021610                    MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
 3737  021606  000002                            RTI                     ;;RESTORE PSW
 3738  021610  012637  000034          70$:     MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
 3739  021614  012637  001214                    MOV     (SP)+,$TMP6
 3740  021620  042737  000340  001214            BIC     #340,$TMP6
 3741  021626  013746  001214                    MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
 3742  021632  012746  021640                    MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
 3743  021636  000002                            RTI                     ;; POP NEW PC AND PS
 3744  021640                          71$:
 3745  021640  012714  177701                    MOV     #-77,   @CDC    ;SET UP COLUMN COUNT
 3746  021644  012715  045442                    MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
 3747  021650  005213                            INC     @CDS            ;START READING
 3748  021652  000777                            BR      .               ;WAIT FOR AN INTERRUPT
 3749
 3750  021654  022626                  TINTFA:  CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
 3751  021656  022713  000300                    CMP     #000300,@CDS    ;CHECH THE CARD READER STATUS
 3752  021662  001401                            BEQ     1$              ;BRANCH IF OK
 3753  021664  104004                            ERROR +4                        ;CARD READER STATUS ERROR
 3754
 3755  021666                          1$:
                                    ;*****************************************************************
 3756
                                    ;*TEST 41       TEST STACK CHECK ERROR
 3757
                                    ;*****************************************************************
 3758
 3759  021666  000004                  TST41:  SCOPE
 3760                               ;A STACK CHECK ERROR SHOULD SET BIT 15, BIT 14, AND BIT 12
 3761                               ;THIS ERROR OCCURS WHEN THE FEED MECHANISM FAILS TO DELIVER A CARD TO
 3762                               ;THE READ STATION
 3763  021670  004737  025744              JSR     PC,INIT
 3764  021674  104400  036104              TYPE,   MSG38           ;TST41 STACK ERROR TEST
 3765  021700  104400  031706              TYPE,   MSG3            ;"PRESS CARD READER 'STOP'"
 3766  021704  104400  032362              TYPE,   MSG9            ;"SLIDE A CARD FROM THE OUTPUT HOPPER ABOUT
 3767                                                               ;HALF AN INCH BACK INTO THE READ HEAD
 3768                                                               ;BLOCKING THE PHOTO CELL
 3769                                                               ;NOTE: SOME CARD READER MODELS MAY HAVE
 3770                                                               ;A LARGE ROLLER BLOCKING ACCESS TO THE PHOTOCELL
 3771                                                               ;IN WHICH CASE, THE PHOTOCELL CAN BE
 3772                                                               ;BLOCKED BY TEARING OFF A PIECE OF CARD
 3773                                                               ;AND SLIPPING IT IN FRONT OF THE PHOTOCELL
 3774  021710  104400  031576              TYPE,   MSG1            ;"PRESS CARD READER 'RESET'"
 3775  021714  104400  030550              TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
 3776  021720  032713  010000  TLOPG:     BIT     #10000, @CDS    ;CHECK FOR OF LINE
 3777  021724  001775                      BEQ     TLOPG           ;WAIT FOR OFF-LINE
 3778  021726  032713  000010  TLOPGA:    BIT     #10,    @CDS    ;CHECK FOR "TRANSITION TO ON LINE"
 3779  021732  001775                      BEQ     TLOPGA          ;WAIT FOR IT
 3780  021734  022713  100210              CMP     #100210,@CDS    ;CHECK FOR CORRECT STATUS BITS
 3781  021740  001401                      BEQ     1$              ;BRANCH IF OK
 3782  021742  104004                      ERROR +4                        ;STATUS NOT EQUAL TO 100210
 3783
 3784  021744  012714  177701  1$:         MOV     #-77,   @CDC    ;SET UP COLUMN COUNT
 3785  021750  012715  045442              MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
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3786  021754  005213                          TLOPGB: INC     @CDS            ;READ
3787  021756  105713                                  TSTB    @CDS            ;CHECK CONTROLLER READY
3788  021760  100376                                  BPL     TLOPGB          ;WAIT FOR CONTROLLER READY
3789  021762  032713  010000                          BIT     #10000,@CDS     ;CHECK BIT12
3790  021766  001001                                  BNE     1$              ;BRANCH IF SET
3791  021770  104043                                  ERROR +43                       ;OFF-LINE (BIT 12) WASN'T SET
3792
3793  021772  005713                          1$:     TST     @CDS            ;CHECK SPECIAL CONDITION BIT
3794  021774  100401                                  BMI     2$              ;BRANCH IF SET
3795  021776  104026                                  ERROR +26                       ;SPECIAL CONDITION NOT SET
3796
3797  022000  032713  040000                  2$:     BIT     #40000, @CDS    ;CHECK FOR CARD READER ERROR
3798  022004  001001                                  BNE     3$              ;BRANCH IF SET
3799  022006  104035                                  ERROR +35                       ;CARD READER ERROR BIT 14 NOT SET
3800
3801  022010  005777  157224                  3$:     TST     @CDDB           ;TEST BIT15 OF STATUS REGISTER #2
3802  022014  100005                                  BPL     4$              ;BRANCH IF NOT SET INDICATING
3803                                                                           ;OLD CD11 CONTROLLER
3804  022016  032777  010000  157214                  BIT     #10000,@CDDB    ;IS STACK CHECK INDICATOR SET?
3805  022024  001001                                  BNE     4$              ;BRANCH IF SET
3806  022026  104046                                  ERROR +46               ;STACK CHECK BIT12 NOT SET
3807
3808  022030  032713  027577                  4$:     BIT     #027577,@CDS   ;CHECK FOR EXTRA BITS
3809  022034  001401                                  BEQ     5$              ;BRANCH IF OK
3810  022036  104015                                  ERROR +15                       ;STATUS WORD ERROR
3811
3812  022040  012712  022270                  5$:     MOV     #TINTG, @ADINT  ;LOAD RETURN POINTER
3813                                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
3814  022044  005046                                  CLR     -(SP)           ;;
3815  022046  013746  000034                          MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3816  022052  012737  022062  000034                  MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
3817  022060  104400                                  TRAP                    ;;PUSH OLD PSW AN PCON STACK
3818  022062  016666  000002  000006  64$:     MOV     2(SP),6(SP)     ;;
3819  022070  012716  022076                          MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
3820  022074  000002                                  RTI                     ;;RESTORE PSW
3821  022076  012637  000034                  65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3822  022102  012637  001214                          MOV     (SP)+,$TMP6
3823  022106  052737  000340  001214                  BIS     #340,$TMP6
3824  022114  013746  001214                          MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3825  022120  012746  022126                          MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
3826  022124  000002                                  RTI                     ;; POP NEW PC AND PS
3827  022126                                  66$:
3828                                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
3829  022126  005046                                  CLR     -(SP)           ;;
3830  022130  013746  000034                          MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3831  022134  012737  022144  000034                  MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
3832  022142  104400                                  TRAP                    ;;PUSH OLD PSW AN PCON STACK
3833  022144  016666  000002  000006  67$:     MOV     2(SP),6(SP)     ;;
3834  022152  012716  022160                          MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
3835  022156  000002                                  RTI                     ;;RESTORE PSW
3836  022160  012637  000034                  68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3837  022164  012662  000002                          MOV     (SP)+,2(ADINT)
3838                                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
3839  022170  005046                                  CLR     -(SP)           ;;
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3840  022172  013746  000034                        MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3841  022176  012737  022206  000034                MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
3842  022204  104400                                TRAP                    ;;PUSH OLD PSW AN PCON STACK
3843  022206  016666  000002  000006  69$:         MOV     2(SP),6(SP)     ;;
3844  022214  012716  022222                        MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
3845  022220  000002                                RTI                     ;;RESTORE PSW
3846  022222  012637  000034          70$:         MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3847  022226  012637  001214                        MOV     (SP)+,$TMP6
3848  022232  042737  000340  001214                BIC     #340,$TMP6
3849  022240  013746  001214                        MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3850  022244  012746  022252                        MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
3851  022250  000002                                RTI                     ;; POP NEW PC AND PS
3852  022252                          71$:
3853  022252  012713  000100                        MOV     #100,   @CDS    ;SET INTERRUPT ENABLE
3854  022256  104400  031576                        TYPE,   MSG1            ;"PRESS CARD READER 'RESET'"
3855  022262  104400  030550                        TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
3856  022266  000777                                BR      .               ;WAIT FOR THE INTERRUPT
3857
3858  022270  022626                  TINTG:  CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
3859  022272  012712  022520                        MOV     #TINTGA,@ADINT  ;LOAD RETURN POINTER
3860                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
3861  022276  005046                                CLR     -(SP)           ;;
3862  022300  013746  000034                        MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3863  022304  012737  022314  000034                MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
3864  022312  104400                                TRAP                    ;;PUSH OLD PSW AN PCON STACK
3865  022314  016666  000002  000006  64$:         MOV     2(SP),6(SP)     ;;
3866  022322  012716  022330                        MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
3867  022326  000002                                RTI                     ;;RESTORE PSW
3868  022330  012637  000034          65$:         MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3869  022334  012637  001214                        MOV     (SP)+,$TMP6
3870  022340  052737  000340  001214                BIS     #340,$TMP6
3871  022346  013746  001214                        MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3872  022352  012746  022360                        MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
3873  022356  000002                                RTI                     ;; POP NEW PC AND PS
3874  022360                          66$:
3875                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
3876  022360  005046                                CLR     -(SP)           ;;
3877  022362  013746  000034                        MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3878  022366  012737  022376  000034                MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
3879  022374  104400                                TRAP                    ;;PUSH OLD PSW AN PCON STACK
3880  022376  016666  000002  000006  67$:         MOV     2(SP),6(SP)     ;;
3881  022404  012716  022412                        MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
3882  022410  000002                                RTI                     ;;RESTORE PSW
3883  022412  012637  000034          68$:         MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
3884  022416  012662  000002                        MOV     (SP)+,2(ADINT)
3885                                  ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
3886  022422  005046                                CLR     -(SP)           ;;
3887  022424  013746  000034                        MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
3888  022430  012737  022440  000034                MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
3889  022436  104400                                TRAP                    ;;PUSH OLD PSW AN PCON STACK
3890  022440  016666  000002  000006  69$:         MOV     2(SP),6(SP)     ;;
3891  022446  012716  022454                        MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
3892  022452  000002                                RTI                     ;;RESTORE PSW
3893  022454  012637  000034          70$:         MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
```

```
3894  022460  012637  001214          MOV     (SP)+,$TMP6
3895  022464  042737  000340  001214  BIC     #340,$TMP6
3896  022472  013746  001214          MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
3897  022476  012746  022504          MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
3898  022502  000002                  RTI                     ;; POP NEW PC AND PS
3899  022504                  71$:
3900  022504  012714  177701          MOV     #-77,   @CDC    ;SET UP COLUMN COUNT
3901  022510  012715  045442          MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
3902  022514  005213                  INC     @CDS            ;START READING
3903  022516  000777                  BR      .               ;WAIT FOR AN INTERRUPT
3904
3905  022520  022626          TINTGA: CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
3906  022522  022713  000300          CMP     #000300,@CDS    ;CHECH THE CARD READER STATUS
3907  022526  001401                  BEQ     1$              ;BRANCH IF OK
3908  022530  104004                  ERROR +4                        ;CARD READER STATUS ERROR
3909
3910  022532                  1$:
3911                          ;ON M-1000/M-200 BIT 13 IS ALWAYS CLEARED
3912                          ;ON M-1200 IF END OF FILE BUTTON IS PRESSED WITH INPUT
3913                          ;HOPPER LOADED THEN WHEN INPUT HOPPER BECOMES EMPTY
3914                          ;HOPPER CHECK INDICATOR LIGHT COMES ON AND BITS
3915                          ;13  14 AND  15 ARE SET
3916
3917
3918  022532  005737  001266          TST     CD1000          ;IS READER M1000/M200?
3919  022536  001402                  BEQ     TSTM12          ;BRANCH IF READER IS M-1200
3920  022540  000137  023256          JMP     TSTM10          ;OUT OF THIS TEST IF M1000/M200
3921
3922  022544                  TSTM12:
3923                          ;*****************************************************************
3924                          ;*TEST 42       TEST 'END OF FILE' AND HOPPER CHECK
3925                          ;*****************************************************************
3926  022544  000004          TST42:  SCOPE
3927  022546  004737  025744          JSR     PC,     INIT
3928  022552  104400  036140          TYPE,   MSG39           ;TST42 EOF & HOPPER CHECK
3929  022556  104400  033506          TYPE,   MSG20           ;"PUT ANY TWO CARDS IN INPUT HOPPER"
3930  022562  104400  031576          TYPE,   MSG1            ;"PRESS CARD READER 'RESET'"
3931  022566  104400  031632          TYPE,   MSG2            ;"THEN HIT 'CONTINUE' ON THE CONSOLE"
3932  022572  104400  030550          TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
3933  022576  000000                  HALT
3934
3935  022600  032713  000010  1$:     BIT     #10,    @CDS    ;CHECK FOR TRANSITION TO ON LINE
3936  022604  001775                  BEQ     1$              ;WAIT FOR IT
3937  022606  104400  033552          TYPE,   MSG21           ;"PRESS END OF FILE BUTTON"
3938  022612  104400  031632          TYPE,   MSG2            ;"THEN HIT 'CONTINUE' ON THE CONSOLE"
3939  022616  104400  030550          TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
3940  022622  004737  025744          JSR     PC,     INIT
3941  022626  000000                  HALT
3942
3943
3944  022630  032713  020000          BIT     #20000, @CDS    ;CHECK BIT 13
3945  022634  001401                  BEQ     2$              ;BRANCH IF NOT SET
3946  022636  104047                  ERROR +47                       ;EOF SET FROM BEGINNING
3947
```

```
                                                ;CHECK BIT 14
022640  032713  040000          2$:   BIT   #40000, @CDS
022644  001401                  BEQ   3$          ;BRANCH IF NOT SET
022646  104050                  ERROR +50                 ;READER CHECK ERROR SET FROM BEGINNING
                                                ;CHECK BIT 2
022650  032713  000004          3$:   BIT   #4,    @CDS
022654  001401                  BEQ   4$          ;BRANCH IF NOT SET
022656  104051                  ERROR +51                 ;HOPPER CHECK SET FROM BEGINNING
                                                ;CHECK ERROR BIT
022660  005713                  4$:   TST   @CDS
022662  100001                  BPL   5$          ;BRANCH IF NOT SET
022664  104014                  ERROR +14                 ;ERROR SET FROM BEGINNING
022666  012712  023120          5$:   MOV   #TINTI, @ADINT  ;LOAD RETURN POINTER
022672                          SECN:
                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
022672  005046                  CLR   -(SP)               ;;
022674  013746  000034          MOV   34,-(SP)            ;;SAVE CURRENT TRAP VECTOR
022700  012737  022710  000034  MOV   #64$,34            ;;SETUP NEW TRAP VECTOT
022706  104400                  TRAP                      ;;PUSH OLD PSW AN PCON STACK
022710  016666  000002  000006  64$:  MOV   2(SP),6(SP)   ;;
022716  012716  022724          MOV   #65$,(SP)                 ;;REPLACE OLD PC WITH NEW
022722  000002                  RTI                       ;;RESTORE PSW
022724  012637  000034          65$:  MOV   (SP)+,34              ;;RESTORE OLD TRAP  VECTOR
022730  012637  001214          MOV   (SP)+,$TMP6
022734  052737  000340  001214  BIS   #340,$TMP6
022742  013746  001214          MOV   $TMP6,-(SP)         ;;PUT NEW PS ON STACK
022746  012746  022754          MOV   #66$,-(SP)          ;;PUT NEW PC ON  STACK
022752  000002                  RTI                       ;; POP NEW PC AND PS
022754                          66$:
                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
022754  005046                  CLR   -(SP)               ;;
022756  013746  000034          MOV   34,-(SP)            ;;SAVE CURRENT TRAP VECTOR
022762  012737  022772  000034  MOV   #67$,34            ;;SETUP NEW TRAP VECTOT
022770  104400                  TRAP                      ;;PUSH OLD PSW AN PCON STACK
022772  016666  000002  000006  67$:  MOV   2(SP),6(SP)   ;;
023000  012716  023006          MOV   #68$,(SP)                 ;;REPLACE OLD PC WITH NEW
023004  000002                  RTI                       ;;RESTORE PSW
023006  012637  000034          68$:  MOV   (SP)+,34              ;;RESTORE OLD TRAP  VECTOR
023012  012662  000002          MOV   (SP)+,2(ADINT)
                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
023016  005046                  CLR   -(SP)               ;;
023020  013746  000034          MOV   34,-(SP)            ;;SAVE CURRENT TRAP VECTOR
023024  012737  023034  000034  MOV   #69$,34            ;;SETUP NEW TRAP VECTOT
023032  104400                  TRAP                      ;;PUSH OLD PSW AN PCON STACK
023034  016666  000002  000006  69$:  MOV   2(SP),6(SP)   ;;
023042  012716  023050          MOV   #70$,(SP)                 ;;REPLACE OLD PC WITH NEW
023046  000002                  RTI                       ;;RESTORE PSW
023050  012637  000034          70$:  MOV   (SP)+,34              ;;RESTORE OLD TRAP  VECTOR
023054  012637  001214          MOV   (SP)+,$TMP6
```

```
 4002  023060  042737  000340  001214          BIC     #340,$TMP6
 4003  023066  013746  001214                  MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
 4004  023072  012746  023100                  MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
 4005  023076  000002                          RTI                     ;; POP NEW PC AND PS
 4006  023100                          71$:
 4007  023100  012713  000100                  MOV     #100,   @CDS    ;SET INTERRUPT ENABLE
 4008  023104  012714  177701                  MOV     #-77,   @CDC    ;SET UP COLUMN COUNT
 4009  023110  012715  045442                  MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
 4010  023114  005213                          INC     @CDS            ;START READER
 4011  023116  000777                          BR      .               ;WAIT FOR AN INTERRUPT
 4012
 4013
 4014  023120  022626                  TINTI:  CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
 4015
 4016  023122  032713  020000                  BIT     #20000, @CDS    ;CHECK BIT 13
 4017  023126  001401                          BEQ     1$              ;BRANCH IF NOT SET
 4018  023130  104047                          ERROR +47                       ;EOF SET AT END OF ONE CARD
 4019
 4020  023132  032713  040000          1$:     BIT     #40000, @CDS    ;CHECK BIT 14
 4021  023136  001401                          BEQ     2$              ;BRANCH IF NOT SET
 4022  023140  104050                          ERROR +50                       ;READER CHECK ERROR SET AT END OF ONE CARD
 4023
 4024  023142  005713                  2$:     TST     @CDS            ;CHECK ERROR BIT
 4025  023144  100001                          BPL     3$              ;BRANCH IF NOT SET
 4026  023146  104014                          ERROR +14                       ;ERROR SET AT END OF ONE CARD
 4027
 4028  023150  012712  023156          3$:     MOV     #TINTIA,@ADINT  ;LOAD RETURN POINTER
 4029  023154  000646                          BR      SECN            ;READ SECOND CARD
 4030  023156  022626                  TINTIA: CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
 4031
 4032  023160  032713  020000                  BIT     #20000, @CDS    ;CHECK BIT 13
 4033  023164  001001                          BNE     1$              ;BRANCH IF SET
 4034  023166  104052                          ERROR +52                       ;EOF NOT SET AT END OF FILE
 4035
 4036  023170  032713  040000          1$:     BIT     #40000, @CDS    ;CHECK BIT 14
 4037  023174  001001                          BNE     2$              ;BRANCH IF SET
 4038  023176  104053                          ERROR +53                       ;READER CHECK NOT SET AT END OF FILE
 4039
 4040  023200  032713  000004          2$:     BIT     #4,     @CDS    ;CHECK BIT 2
 4041  023204  001001                          BNE     3$              ;BRANCH IF SET
 4042  023206  104054                          ERROR +54                       ;HOPPER CHECK NOT SET WHEN HOPPER EMPTY
 4043
 4044
 4045  023210  005713                  3$:     TST     @CDS            ;CHECK ERROR BIT
 4046  023212  100401                          BMI     4$              ;BRANCH IF SET
 4047  023214  104026                          ERROR +26                       ;ERROR BIT NOT SET AT END OF FILE
 4048
 4049  023216  104400  032045          4$:     TYPE,   MSG6            ;"RESTORE CARDS TO THE INPUT HOPPER"
 4050  023222  104400  031576                  TYPE,   MSG1            ;"PRESS CARD READER 'RESET'"
 4051  023226  104400  031632                  TYPE,   MSG2            ;"THEN HIT CONTINUE ON THE CONSOLE"
 4052  023232  104400  030550                  TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
 4053  023236  000000                          HALT
 4054
 4055  023240  032713  000010          5$:     BIT     #10,    @CDS    ;CHECK TRANSITION TO ON LINE
```

```
4056  023244  001775                        BEQ     5$              ;WAIT FOR IT
4057
4058
4059  023246  032713  020000                BIT     #20000, @CDS    ;CHECK BIT 13
4060  023252  001401                        BEQ     TSTM10          ;BRANCH IF NOT SET
4061  023254  104055                        ERROR +55                       ;EOF DIDN'T CLEAR BY TRANSITION TO ON LINE
4062
4063  023256                        TSTM10:
4064                                ;*****************************************************************
4065                                ;*TEST 43       TEST READ CHECK ERROR
4066                                ;*****************************************************************
4067  023256  000004                TST43:  SCOPE
4068                                ;A READ CHECK ERROR SHOULD SET BIT 15, BIT 14, AND BIT 12
4069                                ;THIS ERROR OCCURS WHEN THE READ ELECTRONICS IN THE CARD
4070                                ;READER DISAGREES WITH THE NORMAL UNPUNCHED AREA OF THE CARD
4071  023260  004737  025744                JSR     PC,INIT
4072  023264  104400  036174                TYPE,   MSG40           ;TST43 DARK-LIGHT CHECK
4073  023270  104400  032706                TYPE,   MSG12           ;"PLACE SPECIAL DARK LIGHT CHECK CARD ONLY
4074                                                                  ;AT THE FRONT OF THE INPUT STACK"
4075  023274  104400  031576                TYPE,   MSG1            ;"PRESS CARD READER 'RESET'"
4076  023300  104400  030550                TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
4077  023304  032713  010000        TLOPH:  BIT     #10000, @CDS    ;CHECK FOR OF LINE
4078  023310  001775                        BEQ     TLOPH           ;WAIT FOR OFF-LINE
4079  023312  032713  000010        TLOPHA: BIT     #10,    @CDS    ;CHECK FOR "TRANSITION TO ON LINE"
4080  023316  001775                        BEQ     TLOPHA          ;WAIT FOR IT
4081  023320  022713  140210                CMP     #140210,@CDS    ;CHECK FOR CORRECT STATUS BITS
4082  023324  001401                        BEQ     1$              ;BRANCH IF OK
4083  023326  104004                        ERROR +4                        ;STATUS NOT EQUAL TO 140210
4084
4085  023330  012714  177701        1$:     MOV     #-77,   @CDC    ;SET UP COLUMN COUNT
4086  023334  012715  045442                MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
4087  023340  005213                        INC     @CDS            ;READ
4088  023342  105713                TLOPHB: TSTB    @CDS            ;CHECK CONTROLLER READY
4089  023344  100376                        BPL     TLOPHB          ;WAIT FOR CONTROLLER READY
4090  023346  032713  010000                BIT     #10000,@CDS     ;CHECK BIT12
4091  023352  001001                        BNE     1$              ;BRANCH IF SET
4092  023354  104043                        ERROR +43                       ;OFF-LINE (BIT 12) WASN'T SET
4093
4094  023356  005713                1$:     TST     @CDS            ;CHECK SPECIAL CONDITION BIT
4095  023360  100401                        BMI     2$              ;BRANCH IF SET
4096  023362  104026                        ERROR +26                       ;SPECIAL CONDITION NOT SET
4097
4098  023364  032713  040000        2$:     BIT     #40000, @CDS    ;CHECK FOR CARD READER ERROR
4099  023370  001001                        BNE     3$              ;BRANCH IF SET
4100  023372  104053                        ERROR +53                       ;CARD READER ERROR BIT 14 NOT SET
4101
4102  023374  005777  155640        3$:     TST     @CDDB           ;TEST BIT15 OF STATUS REGISTER #2
4103  023400  100005                        BPL     4$              ;BRANCH IF NOT SET INDICATING
4104                                                                  ;OLD CD11 CONTROLLER
4105  023402  032777  040000  155630        BIT     #40000,@CDDB    ;IS READ CHECK INDICATOR SET?
4106  023410  001001                        BNE     4$              ;BRANCH IF SET
4107  023412  104056                        ERROR +56               ;READ CHECK BIT14 NOT SET
4108
4109  023414  032713  027577        4$:     BIT     #027577,@CDS    ;CHECK FOR EXTRA BITS
```

```
4110  023420  001401                          BEQ     AGAIN           ;BRANCH IF OK
4111  023422  104015                          ERROR +15                       ;STATUS WORD ERROR
4112  023424  104400  035373          AGAIN:  TYPE,   MSG30           ;IS CARD READER RS-1200
4113  023430  105777  155506          WAITA:  TSTB    @$TKS           ;TEST TTY FOR READY
4114  023434  100375                          BPL     WAITA           ;IF NOT READY WAIT
4115  023436  117737  155502  001202          MOVB    @$TKB,$TMP1     ;MOVE CHARACTER IN
4116  023444  105777  155476          WAITB:  TSTB    @$TPS           ;TEST TTY FOR DONE
4117  023450  100375                          BPL     WAITB           ;WAIT IF NOT READY
4118  023452  113777  001202  155470          MOVB    $TMP1,@$TPB     ;ECHO CHARACTER
4119  023460  042737  177600  001202          BIC     #177600,$TMP1   ;CLEAN JUNK OFF BYTE
4120  023466  104400  030550                  TYPE,   CRLF-3
4121  023472  123727  001202  000116          CMPB    $TMP1,#116      ;TEST FOR N
4122  023500  001452                          BEQ     BYPASS          ;SKIP TEST IF NO
4123  023502  123727  001202  000131          CMPB    $TMP1,#131      ;TEST FOR Y
4124  023510  001403                          BEQ     5$              ;BRANCH IF YES
4125  023512  104400  032570                  TYPE,   MSG10           ;WRONG RESPONSE TRY AGAIN
4126  023516  000742                          BR      AGAIN           ;CHARACTER WAS NOT Y OR N
4127                                                                  ;REPEAT QUESTION AGAIN
4128
4129  023520  104400  036226          5$:     TYPE,   MSG41           ;TST43A MIS-REGISTERED CARD TEST
4130  023524  104400  034745                  TYPE,   MSG26           ;TEST FOR VISUAL VERIFICATION OF
4131                                                                  ;READ CHECK LIGHT
4132  023530  104400  030553                  TYPE,   CRLF
4133  023534  104400  035064                  TYPE,   MSG27                   ;PLACE CARD INTO HOPPER
4134  023540  104400  031576                  TYPE,   MSG1
4135  023544  104400  030550                  TYPE,   CRLF-3
4136
4137  023550  032713  010000          TLOPHC: BIT     #10000,@CDS     ;WAIT FOR OFF-LINE
4138  023554  001775                          BEQ     TLOPHC          ;WAIT FOR OFF-LINE
4139  023556  032713  000010          TLOPHD: BIT     #10,@CDS        ;CHECK FOR TRANSITION TO ON LINE
4140  023562  001775                          BEQ     TLOPHD
4141  023564  022713  140210                  CMP     #140210,@CDS    ;CHECK FOR CORRECT STATUS BITS
4142  023570  001401                          BEQ     1$              ;BRANCH IF OK
4143  023572  104004                          ERROR +4                        ;STATUS NOT EQUAL 140210
4144
4145  023574  012714  177701          1$:     MOV     #-77,@CDC       ;SET UP COLUMN COUNT
4146  023600  012715  045442                  MOV     #BUFBEG,@CDA    ;SET UP BUS ADDRESS
4147  023604  005213                          INC     @CDS
4148
4149  023606  105713          TLOPHE: TSTB    @CDS
4150  023610  100376                          BPL     TLOPHE
4151  023612  032713  010000                  BIT     #10000,@CDS
4152  023616  001001                          BNE     1$
4153  023620  104043                          ERROR +43
4154
4155  023622  104400  035236          1$:     TYPE,MSG28              ;CHECK READ CHECK LIGHT
4156  023626  012712  024064          BYPASS: MOV     #TINTH,@ADINT   ;LOAD RETURN POINTER
4157                                          ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #340,PS"
4158  023632  005046                          CLR     -(SP)           ;;
4159  023634  013746  000034                  MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
4160  023640  012737  023650  000034          MOV     #64$,34         ;;SETUP NEW TRAP VECTOT
4161  023646  104400                          TRAP                    ;;PUSH OLD PSW AN PCON STACK
4162  023650  016666  000002  000006  64$:    MOV     2(SP),6(SP)     ;;
4163  023656  012716  023664                  MOV     #65$,(SP)               ;;REPLACE OLD PC WITH NEW
```

```
                                                RTI                     ;;RESTORE PSW
                                        65$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
                                                MOV     (SP)+,$TMP6
                                                BIS     #340,$TMP6
                                                MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
                                                MOV     #66$,-(SP)      ;;PUT NEW PC ON  STACK
                                                RTI                     ;; POP NEW PC AND PS
                                        66$:
                                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "MOV PS,2(ADINT)"
                                                CLR     -(SP)           ;;
                                                MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
                                                MOV     #67$,34         ;;SETUP NEW TRAP VECTOT
                                                TRAP                    ;;PUSH OLD PSW AN PCON STACK
                                        67$:    MOV     2(SP),6(SP)     ;;
                                                MOV     #68$,(SP)               ;;REPLACE OLD PC WITH NEW
                                                RTI                     ;;RESTORE PSW
                                        68$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
                                                MOV     (SP)+,2(ADINT)
                                                ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #340,PS"
                                                CLR     -(SP)           ;;
                                                MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
                                                MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
                                                TRAP                    ;;PUSH OLD PSW AN PCON STACK
                                        69$:    MOV     2(SP),6(SP)     ;;
                                                MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
                                                RTI                     ;;RESTORE PSW
                                        70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
                                                MOV     (SP)+,$TMP6
                                                BIC     #340,$TMP6
                                                MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
                                                MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
                                                RTI                     ;; POP NEW PC AND PS
                                        71$:
                                                MOV     #100,   @CDS    ;SET INTERRUPT ENABLE
                                                TYPE,   MSG6            ;"RESTORE CARDS TO THE INPUT HOPPER"
                                                TYPE,   MSG29           ;"PRESS CARD READER 'RESET'"
                                                TYPE,   CRLF-3          ;MOVE MESSAGE UP ON TTY
                                                BR      .               ;WAIT FOR AN INTERRUPT
                                                HALT
                                        TINTH:  CMP     (SP)+,  (SP)+   ;RESTORE THE STACK
                                                SCOPE
                                                TYPE,   $BELL           ;RING-A-DING
                                                JMP     ER12CD          ;LOOP BACK TO THE BEGINNING


                                        ;*************************************************************************
                                        ;ROUTINE TO LOOP THRU A SINGLE INSTRUCTION TEST OR ERROR FUNCTION TEST
                                        ;NOTE THAT SW11 MUST BE DOWN AFTER 2ND HALT
                                        ;NOTE THAT SW(14) MUST BE SET.....MUST BE SET.....MUST BE SET.....
                                        ;*************************************************************************
                                        TESTX:
                                                MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
                                                CLR     (R6)+           ;;CLEAR MEMORY LOCATION
```

```
4218  024106  022706  001126              CMP     #$BDDAT,R6      ;;DONE?
4219  024112  001374                      BNE     .-6             ;;LOOP BACK IF NO
4220  024114  012706  001100              MOV     #STACK,SP       ;;SETUP THE STACK POINTER
4221  024120  012737  026326  000020      MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
4222  024126  012737  000340  000022      MOV     #340,@#IOTVEC+2 ;;LEVEL 7
4223  024134  012737  026152  000030      MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
4224  024142  012737  000340  000032      MOV     #340,@#EMTVEC+2 ;;LEVEL 7
4225  024150  012737  027374  000034      MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
4226  024156  012737  000340  000036      MOV     #340,@#TRAPVEC+2;LEVEL 7
4227  024164  012737  027430  000024      MOV     #$PWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
4228  024172  012737  000340  000026      MOV     #340,@#PWRVEC+2 ;;LEVEL 7
4229  024200  013737  014774  014766      MOV     $ENDCT,$EOPCT   ;;SETUP END-OF-PROGRAM COUNTER
4230  024206  005037  001220              CLR     $TIMES          ;;INITIALIZE NUMBER OF ITERATIONS
4231  024212  012737  015140  000014      MOV     #$RTRN,@#TBITVEC ;;SET "T" BIT VECTOR TO $RTRN
4232  024220  012737  000340  000016      MOV     #340,@#TBITVEC+2 ;;LEVEL 7
4233  024226  012737  000002  015140      MOV     #RTI,$RTRN      ;;SET $RTRN TO A RTI
4234  024234  012737  024262  000010      MOV     #65$,@#RESVEC   ;;TRY TO DO A RTT
4235  024242  005046                      CLR     -(SP)           ;;DUMMY PS
4236  024244  012746  024252              MOV     #64$,-(SP)      ;;AND PC
4237  024250  000006                      RTT                     ;;TRY THE RTT
4238  024252  012737  000006  015140  64$: MOV    #RTT,$RTRN      ;;RTT IS LEGAL--SET $RTRN TO A RTT
4239  024260  000402                      BR      66$
4240  024262  062706  000010          65$: ADD    #10,SP          ;;RTT ILLEGAL--CLEAN OFF THE STACK
4241  024266  012737  000012  000010  66$: MOV    #RESVEC+2,@#RESVEC ;;RESTORE TRAP CATCHER
4242  024274  005037  015146              CLR     $TBIT           ;;CLEAR "T" BIT SWITCH
4243  024300  012737  024300  001106      MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
4244  024306  013746  000004              MOV     @#4,-(SP)       ;;SAVE ERROR VECTOR
4245  024312  013746  000006              MOV     @#6,-(SP)
4246  024316  012737  024332  000004      MOV     #67$,4          ;;SET UP TIME OUT VECTOR
4247  024324  005777  154606              TST     @SWR            ;;TRY TO REFERENCE HARDWARE SWR
4248  024330  000407                      BR      68$             ;;BRANCH IF NO TIMEOUT TRAP OCCURS
4249  024332  012737  000176  001136  67$: MOV    #SWREG,SWR      ;;POINT TO SOFTWARE SWR
4250  024340  012737  000174  001140      MOV     #DISPREG,DISPLAY ;;POINT TO SOFTWARE DISPLAY REG
4251  024346  022626                      CMP     (SP)+,(SP)+     ;;RESTORE STACK
4252  024350  012637  000006          68$: MOV    (SP)+,@#6       ;;RESTORE ERROR VECTOR
4253  024354  012637  000004              MOV     (SP)+,@#4
4254  024360  004737  045366              JSR     PC,SETUP                ;SETUP POINTERS AND FLAGS
4255  024364  104400  034223              TYPE,   MSG23                   ;ASK USER TO LOAD ADDRESS OF DESIRED
4256                                                                      ;TEST INTO SWITCH REGISTER, THEN
4257                                                                      ;PRESS CONTINUE
4258  024370  000000                      HALT                            ;WAIT FOR STARTING ADDRESS
4259  024372  017737  154540  024622      MOV     @SWR,RETRNX             ;STORE STARTING ADDRESS
4260  024400  062737  000002  024622      ADD     #2,RETRNX               ;CHANGE TO FIRST ADDRESS AFTER SCOPE INSTRUCTION
4261  024406  104400  034472              TYPE,   MSG24                   ;ASK USER TO SET SWITCH REGISTER
4262                                                                      ;OPTIONS, THEN PRESS CONTINUE
4263  024412  000000                      HALT                            ;SET SWR OPTIONS (BIT 11 MUST = 0)
4264  024414  032777  010000  154514      BIT     #10000,@SWR             ;CHECK SW12
4265  024422  001432                      BEQ     1$                      ;BRANCH IF NOT SET
4266                                      ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIC #20,PS"
4267  024424  005046                      CLR     -(SP)           ;;
4268  024426  013746  000034              MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
4269  024432  012737  024442  000034      MOV     #69$,34         ;;SETUP NEW TRAP VECTOT
4270  024440  104400                      TRAP                    ;;PUSH OLD PSW AN PCON STACK
4271  024442  016666  000002  000006  69$: MOV    2(SP),6(SP)     ;;
```

```
4272  024450  012716  024456                    MOV     #70$,(SP)               ;;REPLACE OLD PC WITH NEW
4273  024454  000002                            RTI                     ;;RESTORE PSW
4274  024456  012637  000034            70$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
4275  024462  012637  001214                    MOV     (SP)+,$TMP6
4276  024466  042737  000020  001214            BIC     #20,$TMP6
4277  024474  013746  001214                    MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
4278  024500  012746  024506                    MOV     #71$,-(SP)      ;;PUT NEW PC ON  STACK
4279  024504  000002                            RTI                     ;; POP NEW PC AND PS
4280  024506                            71$:
4281  024506  000431                            BR      2$                      ;SKIP NEXT INSTRUCTION
4282  024510                            1$:
4283                                    ;THE FOLLOWING REPRESENTS THE EQUIVALENT OF "BIS #20,PS"
4284  024510  005046                            CLR     -(SP)           ;;
4285  024512  013746  000034                    MOV     34,-(SP)        ;;SAVE CURRENT TRAP VECTOR
4286  024516  012737  024526  000034            MOV     #72$,34         ;;SETUP NEW TRAP VECTOT
4287  024524  104400                            TRAP                    ;;PUSH OLD PSW AN PCON STACK
4288  024526  016666  000002  000006    72$:    MOV     2(SP),6(SP)     ;;
4289  024534  012716  024542                    MOV     #73$,(SP)               ;;REPLACE OLD PC WITH NEW
4290  024540  000002                            RTI                     ;;RESTORE PSW
4291  024542  012637  000034            73$:    MOV     (SP)+,34                ;;RESTORE OLD TRAP  VECTOR
4292  024546  012637  001214                    MOV     (SP)+,$TMP6
4293  024552  052737  000020  001214            BIS     #20,$TMP6
4294  024560  013746  001214                    MOV     $TMP6,-(SP)     ;;PUT NEW PS ON STACK
4295  024564  012746  024572                    MOV     #74$,-(SP)      ;;PUT NEW PC ON  STACK
4296  024570  000002                            RTI                     ;; POP NEW PC AND PS
4297  024572                            74$:
4298  024572  012737  024600  027576    2$:     MOV     #XLOOP,RETURN           ;SAVE RETURN POINT FOR THIS SECTION
4299                                                                    ;FOR POWER FAILURE RETURN
4300  024600  104400  030556            XLOOP:  TYPE,   STMES           ;TYPE MAINDEC TITLE & REV. LEVEL
4301  024604  104400  031454                    TYPE,   MLOOP           ;INDICATE "ENTERING A LOOP ON TEST
4302                                                                    ;SELECTED BY THE USER"
4303  024610  013737  024622  001106            MOV     RETRNX,$LPADR           ;STORE 1ST ADDRESS OF TEST FOR LOOPING
4304                                                                    ;$LPADR WILL BE PICKED UP BY 'SCOPE'
4305  024616  000177  000000                    JMP     @RETRNX         ;JUMP TO TEST SELECTED
4306  024622  000000            RETRNX: 0
4307
4308
4309                                    ;*************************************************************************
4310                                    ;ROUTINE TO CHECK CARDS WHICH HAVE ALL COLUMNS IDENTICALLY PUNCHED.
4311                                    ;THIS ROUTINE ALLOWS SPECIFIC TYPES OF DATA FAILURES TO BE STUDIED
4312                                    ;EASILY.  THE ROUTINE HALTS ONCE AT THE START.  SET THE CORRECT CARD
4313                                    ;IMAGE PATTERN IN SW11-SW00, THEN HIT CONTINUE (AFTER THE DECK IS
4314                                    ;LOADED AND CARD READER IS ON-LINE).  THE PATTERN IS STORED, AND THEN
4315                                    ;EACH COLUMN OF EACH CARD IS READ TWICE AND COMPARED WITH IT.  IF A
4316                                    ;DISCREPANCY OCCURS, THE ERROR IS PRINTED OUT ALONG WITH THE TOTAL
4317                                    ;NUMBER OF CARDS READ AND THE TOTAL NUMBER OF DATA ERRORS DISCOVERED
4318                                    ;UP TO THAT POINT (ALL PRINTOUTS ARE IN OCTAL).  WHEN THE INPUT HOPPER
4319                                    ;IS EMPTY, THE ROUTINE RINGS THE BELL AND WAITS FOR MORE CARDS TO BE
4320                                    ;LOADED AND THE CARD READER TO BE PUT BACK ON-LINE.
4321                                    ;SW15=1 CAUSES A HALT AFTER AN ERROR, AND SW13=1 INHIBITS ERROR PRINTOUTS.
4322                                    ;*************************************************************************
4323
4324
4325  024624                            CKSAME:
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4326  024624  012706  001100                MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
4327  024630  005026                        CLR     (R6)+           ;;CLEAR MEMORY LOCATION
4328  024632  022706  001126                CMP     #$BDDAT,R6      ;;DONE?
4329  024636  001374                        BNE     .-6             ;;LOOP BACK IF NO
4330  024640  012706  001100                MOV     #STACK,SP       ;;SETUP THE STACK POINTER
4331  024644  012737  026326  000020        MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
4332  024652  012737  000340  000022        MOV     #340,@#IOTVEC+2 ;;LEVEL 7
4333  024660  012737  026152  000030        MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
4334  024666  012737  000340  000032        MOV     #340,@#EMTVEC+2 ;;LEVEL 7
4335  024674  012737  027374  000034        MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
4336  024702  012737  000340  000036        MOV     #340,@#TRAPVEC+2;LEVEL 7
4337  024710  012737  027430  000024        MOV     #$PWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
4338  024716  012737  000340  000026        MOV     #340,@#PWRVEC+2 ;;LEVEL 7
4339  024724  013737  014774  014766        MOV     $ENDCT,$EOPCT   ;;SETUP END-OF-PROGRAM COUNTER
4340  024732  005037  001220                CLR     $TIMES          ;;INITIALIZE NUMBER OF ITERATIONS
4341  024736  012737  015140  000014        MOV     #$RTRN,@#TBITVEC ;;SET "T" BIT VECTOR TO $RTRN
4342  024744  012737  000340  000016        MOV     #340,@#TBITVEC+2 ;;LEVEL 7
4343  024752  012737  000002  015140        MOV     #RTI,$RTRN      ;;SET $RTRN TO A RTI
4344  024760  012737  025006  000010        MOV     #65$,@#RESVEC   ;;TRY TO DO A RTT
4345  024766  005046                        CLR     -(SP)           ;;DUMMY PS
4346  024770  012746  024776                MOV     #64$,-(SP)      ;;AND PC
4347  024774  000006                        RTT                     ;;TRY THE RTT
4348  024776  012737  000006  015140  64$:  MOV     #RTT,$RTRN      ;;RTT IS LEGAL--SET $RTRN TO A RTT
4349  025004  000402                        BR      66$
4350  025006  062706  000010          65$:  ADD     #10,SP          ;;RTT ILLEGAL--CLEAN OFF THE STACK
4351  025012  012737  000012  000010  66$:  MOV     #$RESVEC+2,@#$RESVEC ;;RESTORE TRAP CATCHER
4352  025020  005037  015146                CLR     $TBIT           ;;CLEAR "T" BIT SWITCH
4353  025024  012737  025024  001106        MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
4354  025032  013746  000004                MOV     @#4,-(SP)       ;;SAVE ERROR VECTOR
4355  025036  013746  000006                MOV     @#6,-(SP)
4356  025042  012737  025056  000004        MOV     #67$,4          ;;SET UP TIME OUT VECTOR
4357  025050  005777  154062                TST     @SWR            ;;TRY TO REFERENCE HARDWARE SWR
4358  025054  000407                        BR      68$             ;;BRANCH IF NO TIMEOUT TRAP OCCURS
4359  025056  012737  000176  001136  67$:  MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
4360  025064  012737  000174  001140        MOV     #DISPREG,DISPLAY ;;POINT TO SOFTWARE DISPLAY REG
4361  025072  022626                        CMP     (SP)+,(SP)+     ;;RESTORE STACK
4362  025074  012637  000006          68$:  MOV     (SP)+,@#6       ;;RESTORE ERROR VECTOR
4363  025100  012637  000004                MOV     (SP)+,@#4
4364  025104  012737  024624  027576        MOV     #CKSAME,RETURN          ;SAVE RETURN POINT FOR THIS SECTION
4365                                                                  ;FOR POWER FAILURE ROUTINE
4366  025112  104400  030556                TYPE,   STMES           ;TYPE MAINDEC TITLE & REV. LEVEL
4367  025116  104400  031527                TYPE,   MPATS           ;INDICATE "ENTERING SINGLE DATA
4368                                                                  ;PATTERN TESTING"
4369  025122  004737  045366                JSR     PC,SETUP        ;INITIALIZE POINTERS
4370  025126  104400  034574                TYPE,   MSG25           ;ASK USER TO LOAD PATTERN VALUE INTO
4371                                                                  ;SWITCH REGISTER SWS<11:0>, THEN
4372                                                                  ;PRESS CONTINUE
4373  025132  000000                        HALT                    ;WAIT FOR CARD IMAGE PATTERN
4374  025134  017737  153776  025736        MOV     @SWR,CARDIM     ;STORE PATTERN
4375  025142  042737  170000  025736        BIC     #170000,CARDIM  ;CLEAR UPPER BITS OF PATTERN
4376  025150  013737  025736  025740        MOV     CARDIM, CDPK0
4377  025156  005037  025742                CLR     DERFLG
4378  025162  006037  025740                ROR     CDPK0
4379  025166  106137  025741                ROLB    CDPK1
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 4380  025172  106037  025740                 RORB    CDPKO
 4381  025176  106137  025741                 ROLB    CDPK1
 4382  025202  106137  025741                 ROLB    CDPK1
 4383  025206  106137  025741                 ROLB    CDPK1
 4384  025212  106137  025741                 ROLB    CDPK1
 4385  025216  012701  000007                 MOV     #7,     R1
 4386  025222  006037  025740       CKLOP1:   ROR     CDPKO
 4387  025226  103004                 BCC     CKOVR
 4388  025230  005237  025742                 INC     DERFLG
 4389  025234  150137  025741                 BISB    R1,CDPK1
 4390  025240  005301             CKOVR:      DEC     R1
 4391  025242  001367                 BNE     CKLOP1
 4392  025244  104400  034472                 TYPE,   MSG24                   ;ASK USER TO SET SWITCH REGISTER
                                                                               ;OPTIONS, THEN PRESS CONTINUE
 4393
 4394  025250  000000                 HALT                            ;WAIT FOR SWITCH SETTINGS
 4395  025252  004737  025744       CKSTRT:   JSR     PC,INIT
 4396  025256  005037  025734                 CLR     TOTCRD          ;INITIALIZE CARD COUNT
 4397  025262  005037  025732                 CLR     TOTERR          ;INITIALIZE ERROR COUNT
 4398  025266  005037  001260                 CLR     ERFLG           ;CLEAR FLAG FOR PRINTING ERROR HEADING
 4399  025272  105037  025743       CKLOOP:   CLRB    DERFLG+1
 4400  025276  032777  000010  153632         BIT     #10,    @SWR    ;CHECK FOR PACK MODE ONLY
 4401  025304  001410                 BEQ     CKREAD          ;BRANCH IF NOT SET
 4402  025306  032777  000004  153622         BIT     #4,@SWR         ;CHECK FOR IMAGE MODE ONLY
 4403  025314  001004                 BNE     CKREAD          ;BRANCH IF SET
 4404  025316  052713  000002                 BIS     #2,     @CDS    ;SET PACKING MODE
 4405  025322  105137  025743                 COMB    DERFLG+1
 4406  025326  005037  015334       CKREAD:   CLR     CLCNT           ;INITIALIZE COLUMN COUNT
 4407  025332  012700  045442                 MOV     #BUFBEG,R0      ;SET UP BUFFER POINTER
 4408  025336  012714  177660                 MOV     #-120,  @CDC    ;SET UP COLUMN COUNTER
 4409  025342  010015                 MOV     R0,     @CDA    ;SET UP BUS ADDRESS
 4410  025344  005213                 INC     @CDS            ;START READING CARD
 4411  025346  005237  025734                 INC     TOTCRD          ;INCREMENT CARD COUNT
 4412  025352  105713             CKLP1:      TSTB    @CDS            ;CHECK CONTROLLER READY
 4413  025354  100376                 BPL     CKLP1           ;LOOP IF NOT SET
 4414  025356  005713                 TST     @CDS            ;CHECK FOR ERROR
 4415  025360  100435                 BMI     CKERR           ;BRANCH IF ERROR SET
 4416  025362  005737  025742                 TST     DERFLG
 4417  025366  100012                 BPL     CKLOP2
 4418  025370  122037  025741       CKLOP3:   CMPB    (R0)+,CDPK1     ;CHECK DATA (PACKED MODE)
 4419  025374  001054                 BNE     CKFAIL
 4420  025376  005237  015334                 INC     CLCNT
 4421  025402  023727  015334  000120         CMP     CLCNT,#120
 4422  025410  001367                 BNE     CKLOP3
 4423  025412  000727                 BR      CKLOOP
 4424  025414  012037  001200       CKLOP2:   MOV     (R0)+,$TMP0             ;GET VALUE READ FROM CARD
 4425  025420  042737  170000  001200         BIC     #170000,$TMP0           ;STRIP OFF BITS 15 THRU 12
                                                                               ;IN THE EVENT WE ARE TESTING A CD20
 4426
 4427  025426  023737  001200  025736         CMP     $TMP0,  CARDIM          ;CHECK THE DATA (IMAGE MODE)
 4428  025434  001034                 BNE     CKFAIL                  ;BRANCH IF DATA ERROR
 4429  025436  005237  015334                 INC     CLCNT           ;COUNT THE COLUMNS
 4430  025442  023727  015334  000120         CMP     CLCNT,  #120    ;CHECK FOR LAST COLUMN
 4431  025450  001361                 BNE     CKLOP2
 4432  025452  000707                 BR      CKLOOP
 4433
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4434  025454  032713  010000          CKERR:  BIT     #10000,@CDS     ;CHECK FOR OFFLINE
4435  025460  001406                          BEQ     CKERR1          ;BRANCH IF NOT
4436  025462  104400  001222                  TYPE,   $BELL           ;RING-A-DING
4437  025466  032713  000010          CKERR3: BIT     #10,    @CDS    ;CHECK TRANSITION TO ON-LINE
4438  025472  001775                          BEQ     CKERR3          ;BRANCH IF OFF-LINE
4439  025474  000666                          BR      CKSTRT          ;START OVER
4440
4441  025476  032713  004000          CKERR1: BIT     #4000,@CDS      ;CHECK FOR DATA ERROR
4442  025502  001407                          BEQ     CKERR2
4443  025504  005737  025742                  TST     DERFLG
4444  025510  100004                          BPL     CKERR2
4445  025512  122737  000001  025742          CMPB    #1,DERFLG
4446  025520  003323                          BGT     CKLOP3          ;BRANCH IF LEGIT
4447  025522  104062                  CKERR2: ERROR +62               ;REAL, LIVE ERROR.
4448  025524  000662                          BR      CKLOOP
4449
4450  025526  005237  025732          CKFAIL: INC     TOTERR          ;COUNT ERRORS
4451  025532  032777  020000  153376          BIT     #20000,@SWR     ;CHECK FOR INHIBITING PRINTOUT
4452  025540  001052                          BNE     CKERROR         ;BRANCH AROUND PRINTOUT IF SET
4453  025542  005737  001260                  TST     ERFLG           ;TEST FLAG TO PRINT HEADING
4454  025546  001004                          BNE     CKNOHD          ;BRANCH IF ALREADY DONE
4455  025550  005237  001260                  INC     ERFLG           ;PRINT HEADING ONCE ONLY
4456  025554  104400  033442                  TYPE,   MSG19           ;OUTPUT HEADING
4457  025560  104400  030553          CKNOHD: TYPE,   CRLF            ;OUTPUT CARRIAGE RETURN, LINEFEED
4458  025564  005237  015334                  INC     CLCNT           ;STEP UP COLUMN COUNT FOR ERROR REPORT
4459  025570  013746  015334                  MOV     CLCNT,-(SP)     ;PRINT THE COLUMN OF THE CARD
4460  025574  104404                          TYPDS                   ;ON WHICH AN ERROR WAS DETECTED
4461  025576  104400  030545                  TYPE,   SPACE
4462  025602  005337  015334                  DEC     CLCNT           ;DROP COLUMN COUNT BACK AFTER REPORTING
4463  025606  005737  025742                  TST     DERFLG
4464  025612  100007                          BPL     CKNOPK
4465  025614  104400  030545                  TYPE,   SPACE
4466  025620  114046                          MOVB    -(R0),-(SP)     ;PRINT THE INCORRECT VALUE
4467  025622  104402                          TYPOS                   ;THAT WAS READ FROM THE
4468  025624     003                          .BYTE   3               ;COLUMN INDICATED ABOVE
4469  025625     000                          .BYTE   0               ;(PACKED MODE)
4470  025626  105720                          TSTB    (R0)+           ;CORRECT MEMORY LOCATION AFTER PRINTOUT
4471  025630  000404                          BR      CKOVR1
4472  025632  014046          CKNOPK: MOV     -(R0),-(SP)     ;PRINT THE INCORRECT VALUE THAT
4473  025634  104402                          TYPOS                   ;WAS READ FROM THE COLUMN
4474  025636     006                          .BYTE   6               ;INDICATED ABOVE
4475  025637     001                          .BYTE   1               ;(IMAGE MODE)
4476  025640  005720                          TST     (R0)+           ;CORRECT THE MEMORY LOCATION AFTER PRINTOUT
4477  025642  104400  030545          CKOVR1: TYPE,   SPACE
4478  025646  013746  025734                  MOV     TOTCRD,-(SP)    ;PRINT THE CARD NUMBER ON WHICH
4479  025652  104404                          TYPDS                   ;THE ERROR WAS FOUND
4480  025654  104400  030545                  TYPE,   SPACE
4481  025660  013746  025732                  MOV     TOTERR,-(SP)    ;PRINT THE TOTAL NUMBER OF ERRORS
4482  025664  104404                          TYPDS                   ;ACCUMULATED TO NOW
4483  025666  005777  153244          CKERROR:        TST     @SWR            ;CHECK SW15 TO HALT ON ERROR
4484  025672  100001                          BPL     1$              ;BRANCH IF NOT SET
4485  025674  000000                          HALT                    ;HALT ON ERROR
4486  025676  005237  015334          1$:     INC     CLCNT           ;STEP UP COLUMN COUNT TO BE CORRECT FOR
4487                                                                  ;NEXT POSSIBLE COLUMN TO BE CHECKED
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4488  025702  023727  015334  000120          CMP     CLCNT,#120      ;HAVE WE FINISHED A CARD?
4489  025710  001002                          BNE     2$              ;BRANCH IF NO
4490  025712  000137  025272                  JMP     CKLOOP          ;OTHERWISE, GO TO SET UP FOR NEXT CARD
4491  025716  032777  000004  153212  2$:     BIT     #4,@SWR         ;ARE WE DOING PACKED MODE?
4492  025724  001233                          BNE     CKLOP2          ;BRANCH IF NOT
4493  025726  000137  025370                  JMP     CKLOP3          ;OTHERWISE, CONTINUE CHECKING COLUMNS
4494                                                                  ;IN PACKED MODE
4495
4496  025732  000000                  TOTERR: 0
4497  025734  000000                  TOTCRD: 0
4498  025736  000000                  CARDIM: 0
4499  025740     000                  CDPK0:  .BYTE   0
4500  025741     000                  CDPK1:  .BYTE   0
4501  025742  000000                  DERFLG: 0
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                                ;ISSUE MESSAGE IF CARD READER IS OFF-LINE
                                ;WAIT FOR BUSY TO CLEAR IN CASE CARD READER IS STILL READING A CARD
                                ;INITIALIZE STATUS REGISTER AND USE ERROR HALT IF IT DOESN'T CLEAR PROPERLY
                                ;NOTE THAT PROGRAM WILL HANG HERE IF BUSY REMAINS SET
4507  025744  004737  025772   INIT:   JSR     PC,     CKOFFL  ;SEE IF OFF-LINE BIT IS SET
4508  025750  105713           1$:     TSTB    @CDS            ;WAIT FOR CONTROLLER READY, IN CASE
4509  025752  100376                   BPL     1$              ;A CARD IS STILL BEING READ
4510  025754  012713  000400           MOV     #400,   @CDS    ;INITIALIZE THE CARD READER
4511  025760  022713  000200           CMP     #200,   @CDS    ;MAKE SURE INITIALIZATION OK
4512  025764  001401                   BEQ     2$              ;BRANCH IF ALL BITS ZERO
4513  025766  104067                   ERROR +67               ;NOT ALL BITS OF STATUS REGISTER ARE ZERO
4514  025770  000207           2$:     RTS     PC              ;RETURN
4515
4516                                ;SUBROUTINE TO CHECK FOR BIT 12 (OFF-LINE) BEING SET IN CARD
4517                                ;READER CSR, AND PRINT OUT A MESSAGE IF IT IS
4518  025772  032713  010000   CKOFFL: BIT     #10000, @CDS    ;CHECK BIT 12
4519  025776  001001                   BNE     1$              ;BRANCH IF SET
4520  026000  000207                   RTS     PC              ;RETURN IF NOT SET
4521  026002  104400  033410   1$:     TYPE,   MSG18           ;"CARD READER OFF-LINE"
4522  026006  104400  033175           TYPE,   MSG17           ;"REMEDY THE CONDITION ... ETC."
4523  026012  000000                   HALT                    ;WAIT FOR CONTINUE
4524  026014  000766                   BR      CKOFFL          ;CHECK AGAIN
4525
4526
4527                                ;*****************************************************************
4528
4529                                .SBTTL  ERROR MESSAGE TYPEOUT ROUTINE
4530
4531                                ;*THIS ROUTINE USES THE "ITEM CONTROL BYTE" ($ITEMB) TO DETERMINE WHICH
4532                                ;*ERROR IS TO BE REPORTED. IT THEN OBTAINS, FROM THE "ERROR TABLE" ($ERRTB),
4533                                ;*AND REPORTS THE APPROPRIATE INFORMATION CONCERNING THE ERROR.
4534
4535  026016                        $ERRTYP:
4536  026016  104400  001227           TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
4537  026022  010046                   MOV     R0,-(SP)        ;;SAVE R0
4538  026024  005000                   CLR     R0              ;;PICKUP THE ITEM INDEX
4539  026026  153700  001114           BISB    @#$ITEMB,R0
4540  026032  001004                   BNE     1$              ;;IF ITEM NUMBER IS ZERO, JUST
4541                                                            ;;TYPE THE PC OF THE ERROR
4542  026034  013746  001116           MOV     $ERRPC,-(SP)    ;;SAVE $ERRPC FOR TYPEOUT
4543                                                            ;;ERROR ADDRESS
4544  026040  104401                   TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
4545  026042  000426                   BR      6$              ;;GET OUT
4546  026044  005300           1$:     DEC     R0              ;;ADJUST THE INDEX SO THAT IT WILL
4547  026046  006300                   ASL     R0              ;;      WORK FOR THE ERROR TABLE
4548  026050  006300                   ASL     R0
4549  026052  006300                   ASL     R0
4550  026054  062700  001270           ADD     #$ERRTB,R0      ;;FORM TABLE POINTER
4551  026060  012037  026070           MOV     (R0)+,2$        ;;PICKUP "ERROR MESSAGE" POINTER
4552  026064  001404                   BEQ     3$              ;;SKIP TYPEOUT IF NO POINTER
4553  026066  104400                   TYPE                    ;;TYPE THE "ERROR MESSAGE"
4554  026070  000000           2$:     .WORD   0               ;;"ERROR MESSAGE" POINTER GOES HERE
4555  026072  104400  001227           TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
```

```
                                3$:     MOV     (R0)+,4$        ;;PICKUP "DATA HEADER" POINTER
                                        BEQ     5$              ;;SKIP TYPEOUT IF 0
                                        TYPE                    ;;TYPE THE "DATA HEADER"
                                4$:     .WORD   0               ;;"DATA HEADER" POINTER GOES HERE
                                        TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
                                5$:     MOV     @(R0),R0        ;;PICKUP "DATA TABLE" POINTER
                                        BNE     7$              ;;GO TYPE THE DATA
                                6$:     MOV     (SP)+,R0        ;;RESTORE R0
                                        TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
                                        RTS     PC              ;;RETURN
                                7$:
                                        MOV     @(R0)+,-(SP)    ;;SAVE @(R0)+ FOR TYPEOUT
                                        TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
                                        TST     (R0)            ;;IS THERE ANOTHER NUMBER?
                                        BEQ     6$              ;;BR IF NO
                                        TYPE    ,8$             ;;TYPE TWO(2) SPACES
                                        BR      7$              ;;LOOP
                                8$:     .ASCIZ  /  /            ;;TWO(2) SPACES
                                        .EVEN

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

                                .SBTTL  ERROR HANDLER ROUTINE

                                ;*THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
                                ;*SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
                                ;*AND GO TO $ERRTYP ON ERROR
                                ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
                                ;*SW15=1         HALT ON ERROR
                                ;*SW13=1         INHIBIT ERROR TYPEOUTS
                                ;*SW10=1         BELL ON ERROR
                                ;*CALL
                                ;*      ERROR   N       ;;ERROR=EMT AND N=ERROR ITEM NUMBER

                                $ERROR:
                                        MOV     SP,$REG6        ;STACK POINTER POSITION
                                        MOV     2(SP),$REG7     ;CONTENTS OF 'PSW'
                                        MOV     @CDS,$TMP0      ;CONTENTS OF DEVICE 'CDS'
                                        MOV     @CDDB,$TMP1     ;CONTENTS OF DEVICE 'CDD'
                                        MOV     @CDC,$TMP2      ;CONTENTS OF DEVICE 'CDC'
                                        MOV     @CDA,$TMP3      ;CONTENTS OF DEVICE 'CDA'
                                7$:     INCB    $ERFLG          ;;SET THE ERROR FLAG
                                        BEQ     7$              ;;DON'T LET THE FLAG GO TO ZERO
                                        MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER AND ERROR FLAG
                                        BIT     #BIT10,@SWR     ;;BELL ON ERROR?
                                        BEQ     1$              ;;NO - SKIP
                                        TYPE    ,$BELL          ;;RING BELL
                                1$:     INC     $ERTTL          ;;COUNT THE NUMBER OF ERRORS
                                        MOV     (SP),$ERRPC     ;;GET ADDRESS OF ERROR INSTRUCTION
                                        SUB     #2,$ERRPC
                                        MOVB    @$ERRPC,$ITEMB  ;;STRIP AND SAVE THE ERROR ITEM CODE
                                        BIT     #BIT13,@SWR     ;;SKIP TYPEOUT IF SET
                                        BNE     20$             ;;SKIP TYPEOUTS
                                        JSR     PC,$ERRTYP      ;;GO TO USER ERROR ROUTINE
```

```
                                        TYPE    ,$CRLF
                                20$:
                                2$:     TST     @SWR            ;;HALT ON ERROR
                                        BPL     3$              ;;SKIP IF CONTINUE
                                        HALT                    ;;HALT ON ERROR!
                                        CMP     #$ENDAD,@#42    ;;ACT-11 AUTO-ACCEPT?
                                        BNE     3$              ;;BRANCH IF NO
                                        HALT                    ;;YES
                                3$:
                                        RTI                     ;;RETURN

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

                                .SBTTL  SCOPE HANDLER ROUTINE

                                ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
                                ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
                                ;*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
                                ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
                                ;*SW14=1         LOOP ON TEST
                                ;*SW11=1         INHIBIT ITERATIONS
                                ;*CALL
                                ;*      SCOPE           ;;SCOPE=IOT

                                $SCOPE:
                                1$:     BIT     #BIT14,@SWR     ;;LOOP ON PRESENT TEST?
                                        BNE     $OVER           ;;YES IF SW14=1
                                ;#####START OF CODE FOR THE XOR TESTER######
                                $XTSTR: BR      6$              ;;IF RUNNING ON THE "XOR" TESTER CHANGE
                                                                ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
                                        MOV     @#ERRVEC,-(SP)  ;;SAVE THE CONTENTS OF THE ERROR VECTOR
                                        MOV     #5$,@#ERRVEC    ;;SET FOR TIMEOUT
                                        TST     @#177060        ;;TIME OUT ON XOR?
                                        MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
                                        BR      $SVLAD          ;;GO TO THE NEXT TEST
                                5$:     CMP     (SP)+,(SP)+     ;;CLEAR THE STACK AFTER A TIME OUT
                                        MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
                                        BR      $OVER           ;;LOOP ON THE PRESENT TEST
                                6$:;#####END OF CODE FOR THE XOR TESTER#####
                                2$:     TSTB    $ERFLG          ;;HAS AN ERROR OCCURRED?
                                        BEQ     3$              ;;BR IF NO
                                4$:     CLRB    $ERFLG          ;;ZERO THE ERROR FLAG
                                        CLR     $TIMES          ;;CLEAR THE NUMBER OF ITERATIONS TO MAKE
                                3$:     BIT     #BIT11,@SWR     ;;INHIBIT ITERATIONS?
                                        BNE     1$              ;;BR IF YES
                                        TST     $PASS           ;;IF FIRST PASS OF PROGRAM
                                        BEQ     1$              ;;      INHIBIT ITERATIONS
                                        INC     $ICNT           ;;INCREMENT ITERATION COUNT
                                        CMP     $TIMES,$ICNT    ;;CHECK THE NUMBER OF ITERATIONS MADE
                                        BGE     $OVER           ;;BR IF MORE ITERATION REQUIRED
                                1$:     MOV     #1,$ICNT        ;;REINITIALIZE THE ITERATION COUNTER
                                        MOV     $MXCNT,$TIMES   ;;SET NUMBER OF ITERATIONS TO DO
                                $SVLAD: INCB    $TSTNM          ;;COUNT TEST NUMBERS
                                        MOV     (SP),$LPADR     ;;SAVE SCOPE LOOP ADDRESS
```

```
4664  026470  013777  001102  152442  $OVER:  MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER
4665  026476  013716  001106                  MOV     $LPADR,(SP)     ;;FUDGE RETURN ADDRESS
4666  026502  000002                          RTI                     ;;FIXES PS
4667  026504  000001                  $MXCNT: 1                       ;;MAX. NUMBER OF ITERATIONS
4668
4669                                  ;*****************************************************************
4670
4671                                  .SBTTL  TYPE ROUTINE
4672
4673                                  ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
4674                                  ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
4675                                  ;*NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
4676                                  ;*NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
4677                                  ;*NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
4678                                  ;*
4679                                  ;*CALL:
4680                                  ;*1) USING A TRAP INSTRUCTION
4681                                  ;*      TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
4682                                  ;*OR
4683                                  ;*      TYPE
4684                                  ;*      MESADR
4685                                  ;*
4686
4687  026506  105737  001155  $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
4688  026512  100002                  BPL     1$              ;;BR IF YES
4689  026514  000000                  HALT                    ;;HALT HERE IF NO TERMINAL
4690  026516  000407                  BR      3$              ;;LEAVE
4691  026520  010046          1$:     MOV     R0,-(SP)        ;;SAVE R0
4692  026522  017600  000002          MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
4693  026526  112046          2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
4694  026530  001005                  BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
4695  026532  005726                  TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
4696  026534  012600          60$:    MOV     (SP)+,R0        ;;RESTORE R0
4697  026536  062716  000002  3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
4698  026542  000002                  RTI                     ;;RETURN
4699  026544  122716  000011  4$:     CMPB    #THT,(SP)       ;;BRANCH IF <HT>
4700  026550  001426                  BEQ     8$
4701  026552  122716  000200          CMPB    #TCRLF,(SP)     ;;BRANCH IF NOT <CRLF>
4702  026556  001004                  BNE     5$
4703  026560  005726                  TST     (SP)+           ;;POP  <CR><LF> EQUIV
4704  026562  104400                  TYPE                    ;;TYPE A CR AND LF
4705  026564  001227                  $CRLF
4706  026566  000757                  BR      2$              ;;GET NEXT CHARACTER
4707  026570  004737  026652  5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
4708  026574  123726  001154  6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
4709  026600  001352                  BNE     2$              ;;IF NO GO GET NEXT CHAR.
4710  026602  013746  001152          MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
4711                                                          ;;AND THE NULL CHAR.
4712  026606  105366  000001  7$:     DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
4713  026612  002770                  BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
4714  026614  004737  026652          JSR     PC,$TYPEC       ;;GO TYPE A NULL
4715  026620  105337  026716          DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
4716  026624  000770                  BR      7$              ;;LOOP
4717
```

```
                                        ;HORIZONTAL TAB PROCESSOR
                                        
026626  112716  000040          8$:     MOVB    #40,(SP)        ;;REPLACE TAB WITH SPACE
026632  004737  026652          9$:     JSR     PC,$TYPEC       ;;TYPE A SPACE
026636  132737  000007  026715          BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
026644  001372                          BNE     9$              ;;TAB STOP
026646  005726                          TST     (SP)+           ;;POP SPACE OFF STACK
026650  000726                          BR      2$              ;;GET NEXT CHARACTER
026652  105777  152270          $TYPEC: TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
026656  100375                          BPL     $TYPEC
026660  116677  000002  152262          MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
026666  122766  000015  000002          CMPB    #15,2(SP)       ;;BRANCH IF
026674  001003                          BNE     1$              ;;NOT <CR>
026676  105037  026716                  CLRB    $CHARCNT        ;;
026702  000406                          BR      $TYPEX          ;;EXIT
026704  122766  000012  000002  1$:     CMPB    #12,2(SP)       ;;BRANCH IF
026712  002002                          BGE     $TYPEX          ;;<LF>
026714  105227                          INCB    (PC)+           ;;INC SPACE
026716  000000                  $CHARCNT:.WORD  0               ;;COUNT
026720  000207                  $TYPEX: RTS     PC
                                ;;      EQUATES
000011                          THT=11
000200                          TCRLF=200


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

                                .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE

                                ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
                                ;*OCTAL (ASCII) NUMBER AND TYPE IT.
                                ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
                                ;*CALL:
                                ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
                                ;*      TYPOS                   ;;CALL FOR TYPEOUT
                                ;*      .BYTE   N               ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
                                ;*      .BYTE   M               ;;M=1 OR 0
                                ;*                                      ;;1=TYPE LEADING ZEROS
                                ;*                                      ;;0=SUPPRESS LEADING ZEROS
                                ;*
                                ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
                                ;*$TYPOS OR $TYPOC
                                ;*CALL:
                                ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
                                ;*      TYPON                   ;;CALL FOR TYPEOUT
                                ;*
                                ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
                                ;*CALL:
                                ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
                                ;*      TYPOC                   ;;CALL FOR TYPEOUT
                                
026722  017646  000000          $TYPOS: MOV     @(SP),-(SP)     ;;PICKUP THE MODE
026726  116637  000001  027145          MOVB    1(SP),$OFILL    ;;LOAD ZERO FILL SWITCH
026734  112637  027147                  MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE
```

```
4772  026740  062716  000002                    ADD     #2,(SP)          ;;ADJUST RETURN ADDRESS
4773  026744  000406                            BR      $TYPON
4774  026746  112737  000001  027145  $TYPOC:   MOVB    #1,$OFILL        ;;SET THE ZERO FILL SWITCH
4775  026754  112737  000006  027147            MOVB    #6,$OMODE+1      ;;SET FOR SIX(6) DIGITS
4776  026762  112737  000005  027144  $TYPON:   MOVB    #5,$OCNT         ;;SET THE ITERATION COUNT
4777  026770  010346                            MOV     R3,-(SP)         ;;SAVE R3
4778  026772  010446                            MOV     R4,-(SP)         ;;SAVE R4
4779  026774  010546                            MOV     R5,-(SP)         ;;SAVE R5
4780  026776  113704  027147                    MOVB    $OMODE+1,R4      ;;GET THE NUMBER OF DIGITS TO TYPE
4781  027002  005404                            NEG     R4
4782  027004  062704  000006                    ADD     #6,R4            ;;SUBTRACT IT FOR MAX. ALLOWED
4783  027010  110437  027146                    MOVB    R4,$OMODE        ;;SAVE IT FOR USE
4784  027014  113704  027145                    MOVB    $OFILL,R4        ;;GET THE ZERO FILL SWITCH
4785  027020  016605  000012                    MOV     12(SP),R5        ;;PICKUP THE INPUT NUMBER
4786  027024  005003                            CLR     R3               ;;CLEAR THE OUTPUT WORD
4787  027026  006105                  1$:       ROL     R5               ;;ROTATE MSB INTO "C"
4788  027030  000404                            BR      3$               ;;GO DO MSB
4789  027032  006105                  2$:       ROL     R5               ;;FORM THIS DIGIT
4790  027034  006105                            ROL     R5
4791  027036  006105                            ROL     R5
4792  027040  010503                            MOV     R5,R3
4793  027042  006103                  3$:       ROL     R3               ;;GET LSB OF THIS DIGIT
4794  027044  053337  027146                    DECB    $OMODE           ;;TYPE THIS DIGIT?
4795  027050  100016                            BPL     7$               ;;BR IF NO
4796  027052  042703  177770                    BIC     #177770,R3       ;;GET RID OF JUNK
4797  027056  001002                            BNE     4$               ;;TEST FOR 0
4798  027060  005704                            TST     R4               ;;SUPPRESS THIS 0?
4799  027062  001403                            BEQ     5$               ;;BR IF YES
4800  027064  005204                  4$:       INC     R4               ;;DON'T SUPPRESS ANYMORE 0'S
4801  027066  052703  000060                    BIS     #'0,R3           ;;MAKE THIS DIGIT ASCII
4802  027072  052703  000040          5$:       BIS     #' ,R3           ;;MAKE ASCII IF NOT ALREADY
4803  027076  110337  027142                    MOVB    R3,8$            ;;SAVE FOR TYPING
4804  027102  104400  027142                    TYPE    ,8$              ;;GO TYPE THIS DIGIT
4805  027106  105337  027144          7$:       DECB    $OCNT            ;;COUNT BY 1
4806  027112  003347                            BGT     2$               ;;BR IF MORE TO DO
4807  027114  002402                            BLT     6$               ;;BR IF DONE
4808  027116  005204                            INC     R4               ;;INSURE LAST DIGIT ISN'T A BLANK
4809  027120  000744                            BR      2$               ;;GO DO THE LAST DIGIT
4810  027122  012605                  6$:       MOV     (SP)+,R5         ;;RESTORE R5
4811  027124  012604                            MOV     (SP)+,R4         ;;RESTORE R4
4812  027126  012603                            MOV     (SP)+,R3         ;;RESTORE R3
4813  027130  016665  000002  000004            MOV     2(SP),4(SP)      ;;SET THE STACK FOR RETURNING
4814  027136  012616                            MOV     (SP)+,(SP)
4015  027140  000002                            RTI                      ;;RETURN
4816  027142     000          8$:       .BYTE   0                        ;;STORAGE FOR ASCII DIGIT
4817  027143     000                    .BYTE   0                        ;;TERMINATOR FOR TYPE ROUTINE
4818  027144     000          $OCNT:    .BYTE   0                        ;;OCTAL DIGIT COUNTER
4819  027145     000          $OFILL:   .BYTE   0                        ;;ZERO FILL SWITCH
4820  027146  000000          $OMODE:   .WORD   0                        ;;NUMBER OF DIGITS TO TYPE
4821
4822                          ;******************************************************************
4823
4824                          .SBTTL  CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
4825
```

```
                                ;*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

027150                          $TYPDS:
027150  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
027152  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
027154  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
027156  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
027160  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
027162  012746  020200                  MOV     #20200,-(SP)    ;;SET BLANK SWITCH AND SIGN
027166  016605  000020                  MOV     20(SP),R5       ;;GET THE INPUT NUMBER
027172  100004                          BPL     1$              ;;BR IF INPUT IS POS.
027174  005405                          NEG     R5              ;;MAKE THE BINARY NUMBER POS.
027176  112766  000055  000001          MOVB    #'-,1(SP)       ;;MAKE THE ASCII NUMBER NEG.
027204  005000                  1$:     CLR     R0              ;;ZERO THE CONSTANTS INDEX
027206  012703  027364                  MOV     #$DBLK,R3       ;;SETUP THE OUTPUT POINTER
027212  112723  000040                  MOVB    #' ,(R3)+       ;;SET THE FIRST CHARACTER TO A BLANK
027216  005002                  2$:     CLR     R2              ;;CLEAR THE BCD NUMBER
027220  016001  027354                  MOV     $DTBL(R0),R1    ;;GET THE CONSTANT
027224  160105                  3$:     SUB     R1,R5           ;;FORM THIS BCD DIGIT
027226  002402                          BLT     4$              ;;BR IF DONE
027230  005202                          INC     R2              ;;INCREASE THE BCD DIGIT BY 1
027232  000774                          BR      3$
027234  060105                  4$:     ADD     R1,R5           ;;ADD BACK THE CONSTANT
027236  005702                          TST     R2              ;;CHECK IF BCD DIGIT=0
027240  001002                          BNE     5$              ;;FALL THROUGH IF 0
027242  105716                          TSTB    (SP)            ;;STILL DOING LEADING 0'S?
027244  100407                          BMI     7$              ;;BR IF YES
027246  106316                  5$:     ASLB    (SP)            ;;MSD?
027250  103003                          BCC     6$              ;;BR IF NO
027252  116663  000001  177777          MOVB    1(SP),-1(R3)    ;;YES--SET THE SIGN
027260  052702  000060          6$:     BIS     #'0,R2          ;;MAKE THE BCD DIGIT ASCII
027264  052702  000040          7$:     BIS     #' ,R2          ;;MAKE IT A SPACE IF NOT ALREADY A DIGIT
027270  110223                          MOVB    R2,(R3)+        ;;PUT THIS CHARACTER IN THE OUTPUT BUFFER
027272  005720                          TST     (R0)+           ;;JUST INCREMENTING
027274  020027  000010                  CMP     R0,#10          ;;CHECK THE TABLE INDEX
027300  002746                          BLT     2$              ;;GO DO THE NEXT DIGIT
027302  003002                          BGT     8$              ;;GO TO EXIT
027304  010502                          MOV     R5,R2           ;;GET THE LSD
027306  000764                          BR      6$              ;;GO CHANGE TO ASCII
027310  105726                  8$:     TSTB    (SP)+           ;;WAS THE LSD THE FIRST NON-ZERO?
027312  100003                          BPL     9$              ;;BR IF NO
027314  116663  177777  177776          MOVB    -1(SP),-2(R3)   ;;YES--SET THE SIGN FOR TYPING
027322  105013                  9$:     CLRB    (R3)            ;;SET THE TERMINATOR
027324  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
027326  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
027330  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
027332  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
```

```
                        MOV     (SP)+,R0        ;;POP STACK INTO R0
                        TYPE    ,$DBLK          ;;NOW TYPE THE NUMBER
                        MOV     2(SP),4(SP)     ;;ADJUST THE STACK
                        MOV     (SP)+,(SP)
                        RTI                     ;;RETURN TO USER
$DTBL:                  10000.
                        1000.
                        100.
                        10.
$DBLK:                  .BLKW   4

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

                        .SBTTL  TRAP DECODER

;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
;*GO TO THAT ROUTINE.

$TRAP:  MOV     R0,-(SP)        ;;SAVE R0
        MOV     2(SP),R0        ;;GET TRAP ADDRESS
        TST     -(R0)           ;;BACKUP BY 2
        MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
        ASL     R0              ;;POSITION FOR INDEXING
        MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
        RTS     R0              ;;GO TO ROUTINE

                        .SBTTL  TRAP TABLE

;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
;*BY THE "TRAP" INSTRUCTION.

;       ROUTINE
;       -------
$TRPAD:
        $TYPE   ;;CALL=TYPE     TRAP+0(104400)  TTY TYPEOUT ROUTINE
        $TYPOC  ;;CALL=TYPOC    TRAP+1(104401)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
        $TYPOS  ;;CALL=TYPOS    TRAP+2(104402)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
        $TYPON  ;;CALL=TYPON    TRAP+3(104403)  TYPE OCTAL NUMBER (AS PER LAST CALL)
        $TYPDS  ;;CALL=TYPDS    TRAP+4(104404)  TYPE DECIMAL NUMBER (WITH SIGN)

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

                        .SBTTL  POWER DOWN AND UP ROUTINES

;POWER DOWN ROUTINE
$PWRDN: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST UP
        MOV     #340,@#PWRVEC+2 ;;PRIO:7
        MOV     R0,-(SP)        ;;PUSH R0 ON STACK
        MOV     R1,-(SP)        ;;PUSH R1 ON STACK
        MOV     R2,-(SP)        ;;PUSH R2 ON STACK
        MOV     R3,-(SP)        ;;PUSH R3 ON STACK
```

```
 4934  027454  010446                          MOV     R4,-(SP)        ;;PUSH R4 ON STACK
 4935  027456  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
 4936  027460  010637  027570                  MOV     SP,$SAVR6       ;;SAVE SP
 4937  027464  012737  027476  000024          MOV     #$PWRUP,@#PWRVEC ;;SET UP VECTOR
 4938  027472  000000                          HALT
 4939  027474  000776                          BR      .-2             ;;HANG UP
 4940
 4941                                  ;POWER UP ROUTINE
 4942  027476  013706  027570          $PWRUP: MOV     $SAVR6,SP       ;;GET SP
 4943  027502  005037  027570                  CLR     $SAVR6          ;;WAIT LOOP FOR THE TTY
 4944  027506  005237  027570          1$:     INC     $SAVR6          ;;WAIT FOR THE INC
 4945  027512  001375                          BNE     1$              ;;OF  WORD
 4946  027514  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
 4947  027516  012604                          MOV     (SP)+,R4        ;;POP STACK INTO R4
 4948  027520  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
 4949  027522  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
 4950  027524  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
 4951  027526  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
 4952  027530  012737  027430  000024          MOV     #$PWRDN,@#PWRVEC ;;SET UP THE POWER DOWN VECTOR
 4953  027536  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;PRIO:7
 4954  027544  104400                          TYPE                    ;;REPORT THE POWER FAILURE
 4955  027546  031124          $PWRMG: .WORD   POWMES                  ;;POWER FAIL MESSAGE POINTER
 4956  027550  012716                          MOV     (PC)+,(SP)      ;;RESTART AT DISPATCH
 4957  027552  027572          $PWRAD: .WORD   DISPATCH                ;;RESTART ADDRESS
 4958  027554  042766  000020  000002  BIC     #20,2(SP)               ;;CLEAR "T" BIT
 4959  027562  000002                          RTI
 4960  027564  000000          $ILLUP: HALT                            ;;THE POWER UP SEQUENCE WAS STARTED
 4961  027566  000776                          BR      .-2             ;;  BEFORE THE POWER DOWN WAS COMPLETE
 4962  027570  000000          $SAVR6: 0                               ;;PUT THE SP HERE
 4963
 4964  027572  000177  000000  DISPATCH:       JMP     @RETURN         ;ATTEMPT TO RESTART LAST SECTION
 4965                                          ;BEING RUN BEFORE POWER FAILURE
 4966                                          ;OCCURRED
 4967  027576  000000  RETURN:         .WORD   0                       ;THIS LOCATION HOLDS THE STARTING
 4968                                          ;ADDRESS OF THE SECTION BEING RUN
 4969                                          ;BEFORE THE POWER FAILURE OCCURRED
 4970                                          ;EITHER:        BEGIN:
 4971                                          ;               ERCD12:
 4972                                          ;               XLOOP:
 4973                                          ;               CKSAME:
 4974
```

```
4975
4976
4977
4978
4979
4980
4981  027600  004000
4982  027602  014400
4983  027604  024200
4984  027606  034100
4985  027610  044040
4986  027612  054020
4987  027614  064010
4988  027616  074004
4989  027620  004002
4990  027622  004001
4991  027624  024202
4992  027626  034102
4993  027630  044042
4994  027632  054022
4995  027634  064012
4996  027636  074006
4997  027640  002000
4998  027642  012400
4999  027644  022200
5000  027646  032100
5001  027650  042040
5002  027652  052020
5003  027654  062010
5004  027656  072004
5005  027660  002002
5006  027662  002001
5007  027664  022202
5008  027666  032102
5009  027670  042042
5010  027672  052022
5011  027674  062012
5012  027676  072006
5013  027700  001000
5014  027702  011400
5015  027704  021200
5016  027706  031100
5017  027710  041040
5018  027712  051020
5019  027714  061010
5020  027716  071004
5021  027720  001002
5022  027722  001001
5023  027724  021202
5024  027726  031102
5025  027730  041042
5026  027732  051022
5027  027734  061012
5028  027736  071006
```

```
;DATA TABLES FOR DATA RELIABILITY TESTS

;ALPHANUMERIC DECK DATA TABLE
;CARD IMAGE FORM
;
ALPCD:  4000
        14400
        24200
        34100
        44040
        54020
        64010
        74004
        4002
        4001
        24202
        34102
        44042
        54022
        64012
        74006
        2000
        12400
        22200
        32100
        42040
        52020
        62010
        72004
        2002
        2001
        22202
        32102
        42042
        52022
        62012
        72006
        1000
        11400
        21200
        31100
        41040
        51020
        61010
        71004
        1002
        1001
        21202
        31102
        41042
        51022
        61012
        71006
```

```
;COLUMN  ASCII   PUNCH
;1       &       12
;2       A       12 1
;3       B       12 2
;4       C       12 3
;5       D       12 4
;6       E       12 5
;7       F       12 6
;8       G       12 7
;9       H       12 8
;10      I       12 9
;11      [       12 8 2
;12      .       12 8 3
;13      <       12 8 4
;14      (       12 8 5
;15      +       12 8 6
;16      !       12 8 7
;17      -       11
;18      J       11 1
;19      K       11 2
;20      L       11 3
;21      M       11 4
;22      N       11 5
;23      O       11 6
;24      P       11 7
;25      Q       11 8
;26      R       11 9
;27      ]       11 8 2
;28      $       11 8 3
;29      *       11 8 4
;30      )       11 8 5
;31      ;       11 8 6
;32      ^       11 8 7
;33      0       0
;34      /       0 1
;35      S       0 2
;36      T       0 3
;37      U       0 4
;38      V       0 5
;39      W       0 6
;40      X       0 7
;41      Y       0 8
;42      Z       0 9
;43      \       0 8 2
;44      ,       0 8 3
;45      %       0 8 4
;46      +       0 8 5
;47      >       0 8 6
;48      ?       0 8 7
```

```
5029  027740  000000                    0000          ;49     SPACE   BLANK
5030  027742  010400                    10400         ;50     1       1
5031  027744  020200                    20200         ;51     2       2
5032  027746  030100                    30100         ;52     3       3
5033  027750  040040                    40040         ;53     4       4
5034  027752  050020                    50020         ;54     5       5
5035  027754  060010                    60010         ;55     6       6
5036  027756  070004                    70004         ;56     7       7
5037  027760  000002                    0002          ;57     8       8
5038  027762  000001                    0001          ;58     9       9
5039  027764  020202                    20202         ;59     :       8 2
5040  027766  030102                    30102         ;60     ;       8 3
5041  027770  040042                    40042         ;61     @       8 4
5042  027772  050022                    50022         ;62     '       8 5
5043  027774  060012                    60012         ;63     =       8 6
5044  027776  070006                    70006         ;64     "       8 7
5045  030000  004000                    4000          ;65     &       12
5046  030002  014400                    14400         ;66     A       12 1
5047  030004  024200                    24200         ;67     B       12 2
5048  030006  034100                    34100         ;68     C       12 3
5049  030010  044040                    44040         ;69     D       12 4
5050  030012  054020                    54020         ;70     E       12 5
5051  030014  064010                    64010         ;71     F       12 6
5052  030016  074004                    74004         ;72     G       12 7
5053  030020  004002                    4002          ;73     H       12 8
5054  030022  004001                    4001          ;74     I       12 9
5055  030024  024202                    24202         ;75     [       12 8 2
5056  030026  034102                    34102         ;76     .       12 8 3
5057  030030  044042                    44042         ;77     <       12 8 4
5058  030032  054022                    54022         ;78     (       12 8 5
5059  030034  064012                    64012         ;79     +       12 8 6
5060  030036  074006              ALPEND: 74006         ;80     !       12 8 7
5061
5062
5063
5064
                                ;ALPHANUMERIC DECK DATA TABLE
                                ;THE VALUE IS THE ENCODED FORM OF THE DATA
                                ;                                COLUMN  ASCII   PUNCH
5065  030040        200         ALPCDP: .BYTE   200           ;1      &       12
5066  030041        201                 .BYTE   201           ;2      A       12 1
5067  030042        202                 .BYTE   202           ;3      B       12 2
5068  030043        203                 .BYTE   203           ;4      C       12 3
5069  030044        204                 .BYTE   204           ;5      D       12 4
5070  030045        205                 .BYTE   205           ;6      E       12 5
5071  030046        206                 .BYTE   206           ;7      F       12 6
5072  030047        207                 .BYTE   207           ;8      G       12 7
5073  030050        210                 .BYTE   210           ;9      H       12 8
5074  030051        220                 .BYTE   220           ;10     I       12 9
5075  030052        212                 .BYTE   212           ;11     [       12 8 2
5076  030053        213                 .BYTE   213           ;12     .       12 8 3
5077  030054        214                 .BYTE   214           ;13     <       12 8 4
5078  030055        215                 .BYTE   215           ;14     (       12 8 5
5079  030056        216                 .BYTE   216           ;15     +       12 8 6
5080  030057        217                 .BYTE   217           ;16     !       12 8 7
5081  030060        100                 .BYTE   100           ;17     -       11
5082  030061        101                 .BYTE   101           ;18     J       11 1
```

```
5083  030062  102                     .BYTE   102             ;19     K       11 2
5084  030063  103                     .BYTE   103             ;20     L       11 3
5085  030064  104                     .BYTE   104             ;21     M       11 4
5086  030065  105                     .BYTE   105             ;22     N       11 5
5087  030066  106                     .BYTE   106             ;23     O       11 6
5088  030067  107                     .BYTE   107             ;24     P       11 7
5089  030070  110                     .BYTE   110             ;25     Q       11 8
5090  030071  120                     .BYTE   120             ;26     R       11 9
5091  030072  112                     .BYTE   112             ;27     S       11 8 2
5092  030073  113                     .BYTE   113             ;28     T       11 8 3
5093  030074  114                     .BYTE   114             ;29     U       11 8 4
5094  030075  115                     .BYTE   115             ;30     V       11 8 5
5095  030076  116                     .BYTE   116             ;31     W       11 8 6
5096  030077  117                     .BYTE   117             ;32     X       11 8 7
5097  030100  040                     .BYTE   40              ;33     Y       0
5098  030101  041                     .BYTE   41              ;34     Z       0 1
5099  030102  042                     .BYTE   42              ;35     [       0 2
5100  030103  043                     .BYTE   43              ;36     \       0 3
5101  030104  044                     .BYTE   44              ;37     ]       0 4
5102  030105  045                     .BYTE   45              ;38     ^       0 5
5103  030106  046                     .BYTE   46              ;39     _       0 6
5104  030107  047                     .BYTE   47              ;40     `       0 7
5105  030110  050                     .BYTE   50              ;41     a       0 8
5106  030111  060                     .BYTE   60              ;42     b       0 9
5107  030112  052                     .BYTE   52              ;43     c       0 8 2
5108  030113  053                     .BYTE   53              ;44     d       0 8 3
5109  030114  054                     .BYTE   54              ;45     e       0 8 4
5110  030115  055                     .BYTE   55              ;46     f       0 8 5
5111  030116  056                     .BYTE   56              ;47     g       0 8 6
5112  030117  057                     .BYTE   57              ;48     h       0 8 7
5113  030120  000                     .BYTE   0               ;49     SPACE   BLANK
5114  030121  001                     .BYTE   1               ;50     1       1
5115  030122  002                     .BYTE   2               ;51     2       2
5116  030123  003                     .BYTE   3               ;52     3       3
5117  030124  004                     .BYTE   4               ;53     4       4
5118  030125  005                     .BYTE   5               ;54     5       5
5119  030126  006                     .BYTE   6               ;55     6       6
5120  030127  007                     .BYTE   7               ;56     7       7
5121  030130  010                     .BYTE   10              ;57     8       8
5122  030131  020                     .BYTE   20              ;58     9       9
5123  030132  012                     .BYTE   12              ;59     :       8 2
5124  030133  013                     .BYTE   13              ;60     ;       8 3
5125  030134  014                     .BYTE   14              ;61     <       8 4
5126  030135  015                     .BYTE   15              ;62     =       8 5
5127  030136  016                     .BYTE   16              ;63     >       8 6
5128  030137  017                     .BYTE   17              ;64     ?       8 7
5129  030140  200                     .BYTE   200             ;65     @       12
5130  030141  201                     .BYTE   201             ;66     A       12 1
5131  030142  202                     .BYTE   202             ;67     B       12 2
5132  030143  203                     .BYTE   203             ;68     C       12 3
5133  030144  204                     .BYTE   204             ;69     D       12 4
5134  030145  205                     .BYTE   205             ;70     E       12 5
5135  030146  206                     .BYTE   206             ;71     F       12 6
5136  030147  207                     .BYTE   207             ;72     G       12 7
```

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5137  030150      210                       .BYTE   210          ;73     H       12 8
5138  030151      220                       .BYTE   220          ;74     I       12 9
5139  030152      212                       .BYTE   212          ;75     [       12 8 2
5140  030153      213                       .BYTE   213          ;76     .       12 8 3
5141  030154      214                       .BYTE   214          ;77     <       12 8 4
5142  030155      215                       .BYTE   215          ;78     (       12 8 5
5143  030156      216                       .BYTE   216          ;79     +       12 8 6
5144  030157      217             ALPENP:   .BYTE   217          ;80     !       12 8 7
5145
5146                                ;BINARY DECK DATA TABLE
5147                                ;                            COLUMN  PUNCH
5148  030160  000000                BINCD:    0                  ;1      BLANK
5149  030162  000001                          1                  ;2
5150  030164  000002                          2                  ;3
5151  030166  070004                          70004              ;4
5152  030170  060010                          60010              ;5
5153  030172  050020                          50020              ;6
5154  030174  040040                          40040              ;7
5155  030176  030100                          30100              ;8
5156  030200  020200                          20200              ;9
5157  030202  010400                          10400              ;10
5158  030204  001000                          1000               ;11
5159  030206  002000                          2000               ;12
5160  030210  004000                          4000               ;13
5161  030212  171111                          171111             ;14
5162  030214  172222                          172222             ;15
5163  030216  173333                          173333             ;16
5164  030220  174444                          174444             ;17
5165  030222  175555                          175555             ;18
5166  030224  176666                          176666             ;19
5167  030226  177777                          177777             ;20
5168  030230  061010                          61010              ;21
5169  030232  161212                          161212             ;22
5170  030234  171313                          171313             ;23
5171  030236  171414                          171414             ;24
5172  030240  171515                          171515             ;25
5173  030242  171616                          171616             ;26
5174  030244  171717                          171717             ;27
5175  030246  052020                          52020              ;28
5176  030250  172121                          172121             ;29
5177  030252  172323                          172323             ;30
5178  030254  172424                          172424             ;31
5179  030256  172525                          172525             ;32
5180  030260  172626                          172626             ;33
5181  030262  172727                          172727             ;34
5182  030264  173030                          173030             ;35
5183  030266  173131                          173131             ;36
5184  030270  173232                          173232             ;37
5185  030272  173434                          173434             ;38
5186  030274  173535                          173535             ;39
5187  030276  173636                          173636             ;40
5188  030300  173737                          173737             ;41
5189  030302  044040                          44040              ;42
5190  030304  174141                          174141             ;43
```

```
 5191  030306  164242                          164242          ;44
 5192  030310  174343                          174343          ;45
 5193  030312  174545                          174545          ;46
 5194  030314  174646                          174646          ;47
 5195  030316  174747                          174747          ;48
 5196  030320  165050                          165050          ;49
 5197  030322  175151                          175151          ;50
 5198  030324  165252                          165252          ;51
 5199  030326  175353                          175353          ;52
 5200  030330  175454                          175454          ;53
 5201  030332  175656                          175656          ;54
 5202  030334  175757                          175757          ;55
 5203  030336  156060                          156060          ;56
 5204  030340  176161                          176161          ;57
 5205  030342  176262                          176262          ;58
 5206  030344  176363                          176363          ;59
 5207  030346  176464                          176464          ;60
 5208  030350  176565                          176565          ;61
 5209  030352  176767                          176767          ;62
 5210  030354  177070                          177070          ;63
 5211  030356  177171                          177171          ;64
 5212  030360  177272                          177272          ;65
 5213  030362  177373                          177373          ;66
 5214  030364  177474                          177474          ;67
 5215  030366  177575                          177575          ;68
 5216  030370  177676                          177676          ;69
 5217  030372  030101                          30101           ;70
 5218  030374  020202                          20202           ;71
 5219  030376  130303                          130303          ;72
 5220  030400  170404                          170404          ;73
 5221  030402  170505                          170505          ;74
 5222  030404  170606                          170606          ;75
 5223  030406  170707                          170707          ;76
 5224  030410  163210                          163210          ;77
 5225  030412  170123                          170123          ;78
 5226  030414  177654                          177654          ;79
 5227  030416  174567                  BINEND: 174567          ;80
 5228
 5229                          ;BINARY DECK DATA TABLE
 5230                          ;THE VALUE IS THE ENCODED VALUE, WHICH ORS THE OCTAL REPRESENTATION OF
 5231                          ;ROWS ONE THRU SEVEN
 5232                          ;                                COLUMN  ASCII   PUNCH
 5233  030420       000       BINCDP: .BYTE   0               ;1      SPACE   BLANK
 5234  030421       020               .BYTE   20              ;2      9       9
 5235  030422       010               .BYTE   10              ;3      8       8
 5236  030423       007               .BYTE   7               ;4      7       7
 5237  030424       006               .BYTE   6               ;5      6       6
 5238  030425       005               .BYTE   5               ;6      5       5
 5239  030426       004               .BYTE   4               ;7      4       4
 5240  030427       003               .BYTE   3               ;8      3       3
 5241  030430       002               .BYTE   2               ;9      2       2
 5242  030431       001               .BYTE   1               ;10     1       1
 5243  030432       040               .BYTE   40              ;11     0       0
 5244  030433       100               .BYTE   100             ;12     -       11
```

F14


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5245  030434  200                     .BYTE   200             ;13     &       12
5246  030435  067                     .BYTE   67              ;14
5247  030436  117                     .BYTE   117             ;15
5248  030437  177                     .BYTE   177             ;16
5249  030440  207                     .BYTE   207             ;17
5250  030441  267                     .BYTE   267             ;18
5251  030442  317                     .BYTE   317             ;19
5252  030443  377                     .BYTE   377             ;20
5253  030444  046                     .BYTE   46              ;21
5254  030445  056                     .BYTE   56              ;22
5255  030446  077                     .BYTE   77              ;23
5256  030447  047                     .BYTE   47              ;24
5257  030450  067                     .BYTE   67              ;25
5258  030451  057                     .BYTE   57              ;26
5259  030452  077                     .BYTE   77              ;27
5260  030453  105                     .BYTE   105             ;28
5261  030454  127                     .BYTE   127             ;29
5262  030455  137                     .BYTE   137             ;30
5263  030456  107                     .BYTE   107             ;31
5264  030457  127                     .BYTE   127             ;32
5265  030460  117                     .BYTE   117             ;33
5266  030461  137                     .BYTE   137             ;34
5267  030462  147                     .BYTE   147             ;35
5268  030463  167                     .BYTE   167             ;36
5269  030464  157                     .BYTE   157             ;37
5270  030465  147                     .BYTE   147             ;38
5271  030466  167                     .BYTE   167             ;39
5272  030467  157                     .BYTE   157             ;40
5273  030470  177                     .BYTE   177             ;41
5274  030471  204                     .BYTE   204             ;42
5275  030472  227                     .BYTE   227             ;43
5276  030473  216                     .BYTE   216             ;44
5277  030474  237                     .BYTE   237             ;45
5278  030475  227                     .BYTE   227             ;46
5279  030476  217                     .BYTE   217             ;47
5280  030477  237                     .BYTE   237             ;48
5281  030500  246                     .BYTE   246             ;49
5282  030501  267                     .BYTE   267             ;50
5283  030502  256                     .BYTE   256             ;51
5284  030503  277                     .BYTE   277             ;52
5285  030504  247                     .BYTE   247             ;53
5286  030505  257                     .BYTE   257             ;54
5287  030506  277                     .BYTE   277             ;55
5288  030507  305                     .BYTE   305             ;56
5289  030510  327                     .BYTE   327             ;57
5290  030511  317                     .BYTE   317             ;58
5291  030512  337                     .BYTE   337             ;59
5292  030513  307                     .BYTE   307             ;60
5293  030514  327                     .BYTE   327             ;61
5294  030515  337                     .BYTE   337             ;62
5295  030516  347                     .BYTE   347             ;63
5296  030517  367                     .BYTE   367             ;64
5297  030520  357                     .BYTE   357             ;65
5298  030521  377                     .BYTE   377             ;66
```

```
5299  030522      347                                 .BYTE   347             ;67
5300  030523      367                                 .BYTE   367             ;68
5301  030524      357                                 .BYTE   357             ;69
5302  030525      023                                 .BYTE   23              ;70
5303  030526      012                                 .BYTE   12              ;71
5304  030527      033                                 .BYTE   33              ;72
5305  030530      007                                 .BYTE   7               ;73
5306  030531      027                                 .BYTE   27              ;74
5307  030532      017                                 .BYTE   17              ;75
5308  030533      037                                 .BYTE   37              ;76
5309  030534      146                                 .BYTE   146             ;77
5310  030535      037                                 .BYTE   37              ;78
5311  030536      347                                 .BYTE   347             ;79
5312  030537      237                         BINENP: .BYTE   237             ;80
5313
5314  030540   020040   020040      040              .ASCII  /     /
5315  030545      040   000040                       .ASCIZ  /  /
5316  030550   005012      012                       .ASCII  <12><12><12>
5317  030553      015   000012                 CRLF:  .ASCIZ  <15><12>
5318
5319  030556   005015   046412   044501      STMES:  .ASCIZ  <15><12><12>"MAINDEC-11-DZCDB    REV. B"<15><12>
5320  030564   042116   041505   030455
5321  030572   026461   055104   042103
5322  030600   020102   020040   051040
5323  030606   053105   020056   006502
5324  030614   000012
5325
5326  030616   005015   052123   051101      STADDR: .ASCII  <15><12>"STARTING ADDRESSES ARE:"
5327  030624   044524   043516   040440
5328  030632   042104   042522   051523
5329  030640   051505   040440   042522
5330  030646      072
5331  030647      015   031012   030060              .ASCII  <15><12>"200 = INSTRUCTION AND DATA TEST"
5332  030654   036440   044440   051516
5333  030662   051124   041525   044524
5334  030670   047117   040440   042116
5335  030676   042040   052101   020101
5336  030704   042524   052123
5337  030710   005015   030462   020060              .ASCII  <15><12>"210 = ERROR FUNCTION TEST (M-1000/M-200)"
5338  030716   020075   051105   047522
5339  030724   020122   052506   041516
5340  030732   044524   047117   052040
5341  030740   051505   020124   046450
5342  030746   030455   030060   027460
5343  030754   026515   030062   024460
5344  030762   005015   031062   020060              .ASCII  <15><12>"220 = SINGLE TEST LOOP"
5345  030770   020075   044523   043516
5346  030776   042514   052040   051505
5347  031004   020124   047514   050117
5348  031012   005015   032062   020060              .ASCII  <15><12>"240 = READ SINGLE DATA PATTERN TEST"
5349  031020   020075   042522   042101
5350  031026   051440   047111   046107
5351  031034   020105   040504   040524
5352  031042   050040   052101   042524
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 5353  031050  047122  052040  051505
 5354  031056     124
 5355  031057     015  031012  030065          .ASCIZ  <15><12>"250 = ERROR FUNCTION TEST (M-1200)"
 5356  031064  036440  042440  051122
 5357  031072  051117  043040  047125
 5358  031100  052103  047511  020116
 5359  031106  042524  052123  024040
 5360  031114  026515  031061  030060
 5361  031122  000051
 5362
 5363  031124  005015  050012  053517  POWMES: .ASCII  <15><12><12>"POWER FAILURE OCCURRED - WILL ATTEMPT TO"
 5364  031132  051105  043040  044501
 5365  031140  052514  042522  047440
 5366  031146  041503  051125  042522
 5367  031154  020104  020055  044527
 5368  031162  046114  040440  052124
 5369  031170  046505  052120  052040
 5370  031176     117
 5371  031177     015  051012  051505          .ASCIZ  <15><12>"RESTART SECTION OF PROGRAM FORMERLY IN USE"<15><12>
 5372  031204  040524  052122  051440
 5373  031212  041505  044524  047117
 5374  031220  047440  020106  051120
 5375  031226  043517  040522  020115
 5376  031234  047506  046522  051105
 5377  031242  054514  044440  020116
 5378  031250  051525  006505  000012
 5379
 5380  031256  005015  047105  042524  MLOGIC: .ASCIZ  <15><12>"ENTERING LOGIC TESTS"
 5381  031264  044522  043516  046040
 5382  031272  043517  041511  052040
 5383  031300  051505  051524     000
 5384
 5385  031305     015  042412  052116  MDATA:  .ASCIZ  <15><12>"ENTERING DATA TESTS"
 5386  031312  051105  047111  020107
 5387  031320  040504  040524  052040
 5388  031326  051505  051524     000
 5389
 5390  031333     015  042412  052116  M1200E: .ASCIZ  <15><12>"ENTERING M1200 ERROR FUNCTION TESTS"
 5391  031340  051105  047111  020107
 5392  031346  030515  030062  020060
 5393  031354  051105  047522  020122
 5394  031362  052506  041516  044524
 5395  031370  047117  052040  051505
 5396  031376  051524     000
 5397
 5398  031401     015  042412  052116  M1000E: .ASCIZ  <15><12>"ENTERING M1000/M200 ERROR FUNCTION TESTS"
 5399  031406  051105  047111  020107
 5400  031414  030515  030060  027460
 5401  031422  031115  030060  042440
 5402  031430  051122  051117  043040
 5403  031436  047125  052103  047511
 5404  031444  020116  042524  052123
 5405  031452  000123
 5406
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5407  031454  005015  047105  042524  MLOOP:  .ASCIZ  <15><12>"ENTERING A LOOP ON TEST SELECTED BY USER"
5408  031462  044522  043516  040440
5409  031470  046040  047517  020120
5410  031476  047117  052040  051505
5411  031504  020124  042523  042514
5412  031512  052103  042105  041040
5413  031520  020131  051525  051105
5414  031526     000
5415
5416  031527     015  042412  052116  MPATS:  .ASCIZ  <15><12>"ENTERING SINGLE DATA PATTERN TESTING"
5417  031534  051105  047111  020107
5418  031542  044523  043516  042514
5419  031550  042040  052101  020101
5420  031556  040520  052124  051105
5421  031564  020116  042524  052123
5422  031572  047111  000107
5423
5424  031576  005015  051120  051505  MSG1:   .ASCIZ  <15><12>/PRESS CARD READER 'RESET'/
5425  031604  020123  040503  042122
5426  031612  051040  040505  042504
5427  031620  020122  051047  051505
5428  031626  052105  000047
5429  031632  005015  044124  047105  MSG2:   .ASCIZ  <15><12>/THEN CONTINUE DIAGNOSTIC FROM CPU CONSOLE/
5430  031640  041440  047117  044524
5431  031646  052516  020105  044504
5432  031654  043501  047516  052123
5433  031662  041511  043040  047522
5434  031670  020115  050103  020125
5435  031676  047503  051516  046117
5436  031704  000105
5437  031706  005015  051120  051505  MSG3:   .ASCIZ  <15><12>/PRESS CARD READER 'STOP'/
5438  031714  020123  040503  042122
5439  031722  051040  040505  042504
5440  031730  020122  051447  047524
5441  031736  023520     000
5442  031741     015  052012  042510  MSG4:   .ASCIZ  <15><12>/THE INTERRUPT LEVEL WAS /
5443  031746  044440  052116  051105
5444  031754  052522  052120  046040
5445  031762  053105  046105  053440
5446  031770  051501  000040
5447  031774  005015  042522  047515  MSG5:   .ASCIZ  <15><12>/REMOVE ALL CARDS FROM THE INPUT HOPPER/
5448  032002  042526  040440  046114
5449  032010  041440  051101  051504
5450  032016  043040  047522  020115
5451  032024  044124  020105  047111
5452  032032  052520  020124  047510
5453  032040  050120  051105     000
5454  032045     015  051012  051505  MSG6:   .ASCIZ  <15><12>/RESTORE CARDS TO THE INPUT HOPPER/
5455  032052  047524  042522  041440
5456  032060  051101  051504  052040
5457  032066  020117  044124  020105
5458  032074  047111  052520  020124
5459  032102  047510  050120  051105
5460  032110     000
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5461  032111    015  030412  020056  MSG7:   .ASCII  <15><12>/1. PULL OUTPUT STACKER PRESSURE ARM DOWN /
5462  032116  052520  046114  047440
5463  032124  052125  052520  020124
5464  032132  052123  041501  042513
5465  032140  020122  051120  051505
5466  032146  052523  042522  040440
5467  032154  046522  042040  053517
5468  032162  020116
5469  032164  005015  047125  044524          .ASCII  <15><12>/UNTIL HOPPER CHECK LIGHT COMES ON/
5470  032172  020114  047510  050120
5471  032200  051105  041440  042510
5472  032206  045503  046040  043511
5473  032214  052110  041440  046517
5474  032222  051505  047440    116
5475  032227    015  005012  027062          .ASCIZ  <15><12><12>/2. RELEASE STACKER PRESS. ARM/
5476  032234  051040  046105  040505
5477  032242  042523  051440  040524
5478  032250  045503  051105  050040
5479  032256  042522  051523  020056
5480  032264  051101  000115
5481  032270  005015  044012  046117  MSG8:   .ASCII  <15><12><12>/HOLD DOWN THE SWITCH UNDER THE CAP OF THE INPUT /
5482  032276  020104  047504  047127
5483  032304  052040  042510  051440
5484  032312  044527  041524  020110
5485  032320  047125  042504  020122
5486  032326  044124  020105  040503
5487  032334  020120  043117  052040
5488  032342  042510  044440  050116
5489  032350  052125    040
5490  032353    110  050117  042520          .ASCIZ  /HOPPER/
5491  032360  000122
5492  032362  005015  042524  051101  MSG9:   .ASCII  <15><12>/TEAR OFF A PIECE OF CARD AND SLIP IT IN/
5493  032370  047440  043106  040440
5494  032376  050040  042511  042503
5495  032404  047440  020106  040503
5496  032412  042122  040440  042116
5497  032420  051440  044514  020120
5498  032426  052111  044440    116
5499  032433    015  043012  047522          .ASCII  <15><12>/FRONT OF THE PHOTOCELL/
5500  032440  052116  047440  020106
5501  032446  044124  020105  044120
5502  032454  052117  041517  046105
5503  032462    114
5504  032463    015     012                   .ASCII  <15><12>
5505  032465    015  041412  052501          .ASCII  <15><12>/CAUTION:MOVE YOUR FINGERS AWAY FROM THIS /
5506  032472  044524  047117  046472
5507  032500  053117  020105  047531
5508  032506  051125  043040  047111
5509  032514  042507  051522  040440
5510  032522  040527  020131  051106
5511  032530  046517  052040  044510
5512  032536  020123
5513  032540  051101  040505  041040          .ASCIZ  /AREA BEFORE CONTINUING!/
5514  032546  043105  051117  020105
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5515  032554  047503  052116  047111
5516  032562  044525  043516  000041
5517  032570  005015  020412  020441  MSG10:  .ASCIZ  <15><12><12>/!!! WRONG RESPONSE TRY AGAIN !!!/
5518  032576  053440  047522  043516
5519  032604  051040  051505  047520
5520  032612  051516  020105  051124
5521  032620  020131  043501  044501
5522  032626  020116  020441  000041
5523  032634  005015  047510  042114  MSG11:  .ASCIZ  <15><12>/HOLD THE OUTPUT STACKER GATE OPEN. THEN/
5524  032642  052040  042510  047440
5525  032650  052125  052520  020124
5526  032656  052123  041501  042513
5527  032664  020122  040507  042524
5528  032672  047440  042520  027116
5529  032700  052040  042510  000116
5530  032706  005015  042040  051101  MSG12:  .ASCII  <15><12>/ DARK-LIGHT CHECK /
5531  032714  026513  044514  044107
5532  032722  020124  044103  041505
5533  032730  020113
5534  032732  005015  027111  027105          .ASCII  <15><12>/I.E. - TEAR A CORNER OFF A CARD AND PLACE IT/
5535  032740  026440  052040  040505
5536  032746  020122  020101  047503
5537  032754  047122  051105  047440
5538  032762  043106  040440  041440
5539  032770  051101  020104  047101
5540  032776  020104  046120  041501
5541  033004  020105  052111
5542  033010  005015  052101  052040          .ASCIZ  <15><12>   /AT THE BOTTOM OF THE INPUT STACK/
5543  033016  042510  041040  052117
5544  033024  047524  020115  043117
5545  033032  052040  042510  044440
5546  033040  050116  052125  051440
5547  033046  040524  045503     000
5548  033053     015  042012  041505  MSG13:  .ASCIZ  <15><12>/DECK     CARD NUM     CARD COL   SHB     WAS/
5549  033060  020113  020040  020040
5550  033066  040503  042122  047040
5551  033074  046525  020040  020040
5552  033102  041440  051101  020104
5553  033110  047503  020114  020040
5554  033116  044123  020102  020040
5555  033124  020040  040527  000123
5556  033132  005015  046101  044120  MSG14:  .ASCIZ  <15><12>/ALPHA /
5557  033140  020101     000
5558  033143     015  041012  047111  MSG15:  .ASCIZ  <15><12>/BINARY/
5559  033150  051101  000131
5560  033154  005015  044502  020124  MSG16:  .ASCIZ  <15><12>/BIT 15 WAS SET/
5561  033162  032461  053440  051501
5562  033170  051440  052105     000
5563  033175     015  051012  046505  MSG17:  .ASCII  <15><12>/REMEDY THE CONDITION BY RELOADING INPUT HOPPER/
5564  033202  042105  020131  044124
5565  033210  020105  047503  042116
5566  033216  052111  047511  020116
5567  033224  054502  051040  046105
5568  033232  040517  044504  043516
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5569  033240  044440  050116  052125
5570  033246  044040  050117  042520
5571  033254     122
5572  033255     015  053412  052111          .ASCII  <15><12>/WITH CARD DECK - PRESS 'RESET' BUTTON/
5573  033262  020110  040503  042122
5574  033270  042040  041505  020113
5575  033276  020055  051120  051505
5576  033304  020123  051047  051505
5577  033312  052105  020047  052502
5578  033320  052124  047117
5579  033324  005015  047117  041440          .ASCIZ  <15><12>/ON CARD READER AND 'CONTINUE' SWITCH ON CPU PANEL/
5580  033332  051101  020104  042522
5581  033340  042101  051105  040440
5582  033346  042116  023440  047503
5583  033354  052116  047111  042525
5584  033362  020047  053523  052111
5585  033370  044103  047440  020116
5586  033376  050103  020125  040520
5587  033404  042516  000114
5588  033410  005015  040503  042122  MSG18:  .ASCIZ  <15><12>/CARD READER IS OFF-LINE/
5589  033416  051040  040505  042504
5590  033424  020122  051511  047440
5591  033432  043106  046055  047111
5592  033440  000105
5593  033442  005015  020040  041440  MSG19:  .ASCIZ  <15><12>/   COL.   WAS   CARD NUM.  ERRORS/
5594  033450  046117  020056  020040
5595  033456  040527  020123  020040
5596  033464  040503  042122  047040
5597  033472  046525  020056  042440
5598  033500  051122  051117  000123
5599  033506  005015  052520  020124  MSG20:  .ASCIZ  <15><12>/PUT ANY TWO CARDS IN INPUT HOPPER/
5600  033514  047101  020131  053524
5601  033522  020117  040503  042122
5602  033530  020123  047111  044440
5603  033536  050116  052125  044040
5604  033544  050117  042520  000122
5605  033552  005015  051120  051505  MSG21:  .ASCIZ  <15><12>/PRESS END OF FILE BUTTON/
5606  033560  020123  047105  020104
5607  033566  043117  043040  046111
5608  033574  020105  052502  052124
5609  033602  047117     000
5610  033605     015  030412  020056  MSG22:  .ASCII  <15><12>/1. PUT 'HALT'SW. DOWN AND PRESS/
5611  033612  052520  020124  044047
5612  033620  046101  023524  053523
5613  033626  020056  047504  047127
5614  033634  040440  042116  050040
5615  033642  042522  051523
5616  033646  005015  020040  041440          .ASCII  <15><12>/   CONTINUE ON THE CONSOLE UNTIL/
5617  033654  047117  044524  052516
5618  033662  020105  047117  052040
5619  033670  042510  041440  047117
5620  033676  047523  042514  052440
5621  033704  052116  046111
5622  033710  005015  020040  047440          .ASCII  <15><12>/   ONE OR MORE CARDS ARE READ./
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5623  033716  042516  047440  020122
5624  033724  047515  042522  041440
5625  033732  051101  051504  040440
5626  033740  042522  051040  040505
5627  033746  027104
5628  033750  005015  020040  024040          .ASCII  <15><12>"   (FOR THE 11/34 PRESS HLT/SS)"
5629  033756  047506  020122  044124
5630  033764  020105  030461  031457
5631  033772  020064  051120  051505
5632  034000  020123  046110  027524
5633  034006  051523      051
5634  034011      015  005012  027062          .ASCII  <15><12><12>/2. THEN RESTORE HALT SW. TO NORMAL POSITION/
5635  034016  052040  042510  020116
5636  034024  042522  052123  051117
5637  034032  020105  040510  052114
5638  034040  051440  027127  052040
5639  034046  020117  047516  046522
5640  034054  046101  050040  051517
5641  034062  052111  047511      116
5642  034067      015  020012  020040          .ASCII  <15><12>/   AND CONTINUE DIAGNOSTIC FROM CPU CONSOLE/
5643  034074  047101  020104  047503
5644  034102  052116  047111  042525
5645  034110  042040  040511  047107
5646  034116  051517  044524  020103
5647  034124  051106  046517  041440
5648  034132  052520  041440  047117
5649  034140  047523  042514
5650  034144  005015  020040  024040          .ASCIZ  <15><12>"   (11/34 PRESS CNTRL & CONT SIMULTANEOUSLY)"
5651  034152  030461  031457  020064
5652  034160  051120  051505  020123
5653  034166  047103  051124  020114
5654  034174  020046  047503  052116
5655  034202  051440  046511  046125
5656  034210  040524  042516  052517
5657  034216  046123  024531      000
5658
5659  034223      015  046012  040517  MSG23:  .ASCII  <15><12>"LOAD THE ADDRESS OF THE DESIRED TEST INTO THE"
5660  034230  020104  044124  020105
5661  034236  042101  051104  051505
5662  034244  020123  043117  052040
5663  034252  042510  042040  051505
5664  034260  051111  042105  052040
5665  034266  051505  020124  047111
5666  034274  047524  052040  042510
5667  034302  005015  053523  052111          .ASCII  <15><12>"SWITCH REGISTER - I.E. THE ADDRESS OF THE SCOPE"
5668  034310  044103  051040  043505
5669  034316  051511  042524  020122
5670  034324  020055  027111  027105
5671  034332  052040  042510  040440
5672  034340  042104  042522  051523
5673  034346  047440  020106  044124
5674  034354  020105  041523  050117
5675  034362      105
5676  034363      015  044412  051516          .ASCII  <15><12>"INSTRUCTION AT THE BEGINNING OF THE TEST"
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 5677  034370  051121  041525  044524
 5678  034376  047117  040440  020124
 5679  034404  044124  020105  042502
 5680  034412  044507  047116  047111
 5681  034420  020107  043117  052040
 5682  034426  042510  052040  051505
 5683  034434     124
 5684  034435     015  052012  042510          .ASCIZ  <15><12>"THEN PRESS CONTINUE SWITCH"
 5685  034442  020116  051120  051505
 5686  034450  020123  047503  052116
 5687  034456  047111  042525  051440
 5688  034464  044527  041524  000110
 5689
 5690  034472  005015  042523  020124  MSG24:  .ASCII  <15><12>"SET DESIRED SWITCH REGISTER OPTIONS"
 5691  034500  042504  044523  042522
 5692  034506  020104  053523  052111
 5693  034514  044103  051040  043505
 5694  034522  051511  042524  020122
 5695  034530  050117  044524  047117
 5696  034536     123
 5697  034537     015  052012  042510          .ASCIZ  <15><12>"THEN PRESS CONTINUE SWITCH"
 5698  034544  020116  051120  051505
 5699  034552  020123  047503  052116
 5700  034560  047111  042525  051440
 5701  034566  044527  041524  000110
 5702
 5703  034574  005015  047514  042101  MSG25:  .ASCII  <15><12>"LOAD DESIRED PATTERN VALUE INTO THE SWITCH"
 5704  034602  042040  051505  051111
 5705  034610  042105  050040  052101
 5706  034616  042524  047122  053040
 5707  034624  046101  042525  044440
 5708  034632  052116  020117  044124
 5709  034640  020105  053523  052111
 5710  034646  044103
 5711  034650  005015  042522  044507          .ASCII  <15><12>"REGISTER - I.E. INTO SWS<11:0>"
 5712  034656  052123  051105  026440
 5713  034664  044440  042456  020056
 5714  034672  047111  047524  051440
 5715  034700  051527  030474  035061
 5716  034706  037060
 5717  034710  005015  044124  047105          .ASCIZ  <15><12>"THEN PRESS CONTINUE SWITCH"
 5718  034716  050040  042522  051523
 5719  034724  041440  047117  044524
 5720  034732  052516  020105  053523
 5721  034740  052111  044103     000
 5722
 5723  034745     015  052012  044510  MSG26:  .ASCII  <15><12>/THIS TEST VERIFIES THE ABILITY OF THE/
 5724  034752  020123  042524  052123
 5725  034760  053040  051105  043111
 5726  034766  042511  020123  044124
 5727  034774  020105  041101  046111
 5728  035002  052111  020131  043117
 5729  035010  052040  042510
 5730  035014  005015  051522  031061          .ASCIZ  <15><12>/RS1200 TO DETECT MIS-REGISTERED CARDS/
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 5731  035022  030060  052040  020117
 5732  035030  042504  042524  052103
 5733  035036  046440  051511  051055
 5734  035044  043505  051511  042524
 5735  035052  042522  020104  040503
 5736  035060  042122  000123
 5737
 5738  035064  005015  040515  042513  MSG27:  .ASCII  <15><12>/MAKE AND THEN PLACE A SPECIAL CARD INTO THE INPUT/
 5739  035072  040440  042116  052040
 5740  035100  042510  020116  046120
 5741  035106  041501  020105  020101
 5742  035114  050123  041505  040511
 5743  035122  020114  040503  042122
 5744  035130  044440  052116  020117
 5745  035136  044124  020105  047111
 5746  035144  052520     124
 5747  035147     015  044012  050117          .ASCIZ  <15><12>/HOPPER.  REFER TO SECTION 6.3 OF LISTING FOR DETAILS/
 5748  035154  042520  027122  020040
 5749  035162  042522  042506  020122
 5750  035170  047524  051440  041505
 5751  035176  044524  047117  033040
 5752  035204  031456  047440  020106
 5753  035212  044514  052123  047111
 5754  035220  020107  047506  020122
 5755  035226  042504  040524  046111
 5756  035234  000123
 5757
 5758  035236  005015  051042  040505  MSG28:  .ASCIZ  <15><12>/"READ CHECK LIGHT" SHOULD BE BLINKING/
 5759  035244  020104  044103  041505
 5760  035252  020113  044514  044107
 5761  035260  021124  051440  047510
 5762  035266  046125  020104  042502
 5763  035274  041040  044514  045516
 5764  035302  047111  000107
 5765
 5766  035306  005015  051120  051505  MSG29:  .ASCII  <15><12>/PRESS "RESET" TO REPEAT ERROR/
 5767  035314  020123  051042  051505
 5768  035322  052105  020042  047524
 5769  035330  051040  050105  040505
 5770  035336  020124  051105  047522
 5771  035344     122
 5772  035345     015  043012  047125          .ASCIZ  <15><12>/FUNCTION TEST AGAIN/
 5773  035352  052103  047511  020116
 5774  035360  042524  052123  040440
 5775  035366  040507  047111     000
 5776  035373     015  044412  020123  MSG30:  .ASCII  <15><12>/IS THE CARD READER UNDER/
 5777  035400  044124  020105  040503
 5778  035406  042122  051040  040505
 5779  035414  042504  020122  047125
 5780  035422  042504     122
 5781  035425     015  052012  051505          .ASCIZ  <15><12> /TEST MODEL RS-1200?(Y OR N)/
 5782  035432  020124  047515  042504
 5783  035440  020114  051522  030455
 5784  035446  030062  037460  054450
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 5785  035454  047440  020122  024516
 5786  035462     000
 5787  035463     015  040412  020124  MSG31:  .ASCII  <15><12>/AT THIS TIME SET THE APPROPRIATE/
 5788  035470  044124  051511  052040
 5789  035476  046511  020105  042523
 5790  035504  020124  044124  020105
 5791  035512  050101  051120  050117
 5792  035520  044522  052101     105
 5793  035525     015  051412  044527          .ASCII  <15><12>/SWITCHES ON THE SR. (REFER TO THE/
 5794  035532  041524  042510  020123
 5795  035540  047117  052040  042510
 5796  035546  051440  027122  024040
 5797  035554  042522  042506  020122
 5798  035562  047524  052040  042510
 5799  035570  005015  047504  052503          .ASCIZ  <15><12>/DOCUMENTATION ON SWITCH REGISTER SETTINGS)/
 5800  035576  042515  052116  052101
 5801  035604  047511  020116  047117
 5802  035612  051440  044527  041524
 5803  035620  020110  042522  044507
 5804  035626  052123  051105  051440
 5805  035634  052105  044524  043516
 5806  035642  024523     000
 5807  035645     015  052012  052123  MSG32:  .ASCIZ  <15><12>/TST33  DATA LATE TEST/
 5808  035652  031463  020040  040504
 5809  035660  040524  046040  052101
 5810  035666  020105  042524  052123
 5811  035674     000
 5812  035675     015  052012  052123  MSG33:  .ASCIZ  <15><12>/TST34  OFF-LINE TEST/
 5813  035702  032063  020040  043117
 5814  035710  026506  044514  042516
 5815  035716  052040  051505  000124
 5816  035724  005015  051524  031524  MSG34:  .ASCIZ  <15><12>/TST35  SPECIAL INT. COND. TEST/
 5817  035732  020065  051440  042520
 5818  035740  044503  046101  044440
 5819  035746  052116  020056  047503
 5820  035754  042116  020056  042524
 5821  035762  052123     000
 5822  035765     015  052012  052123  MSG35:  .ASCIZ  <15><12>/TST36  HOPPER EMPTY TEST/
 5823  035772  033063  020040  047510
 5824  036000  050120  051105  042440
 5825  036006  050115  054524  052040
 5826  036014  051505  000124
 5827  036020  005015  051524  031524  MSG36:  .ASCIZ  <15><12>/TST37  STACKER FULL TEST/
 5828  036026  020067  051440  040524
 5829  036034  045503  051105  043040
 5830  036042  046125  020114  042524
 5831  036050  052123     000
 5832  036053     015  052012  052123  MSG37:  .ASCIZ  <15><12>/TST40  PICK CHECK TEST/
 5833  036060  030064  020040  044520
 5834  036066  045503  041440  042510
 5835  036074  045503  052040  051505
 5836  036102  000124
 5837  036104  005015  051524  032124  MSG38:  .ASCIZ  <15><12>/TST41  STACKER ERROR TEST/
 5838  036112  020061  051440  040524
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5839  036120  045503  051105  042440
5840  036126  051122  051117  052040
5841  036134  051505  000124
5842  036140  005015  051524  032124  MSG39:  .ASCIZ  <15><12>/TST42  EOF & HOPPER CHECK/
5843  036146  020062  042440  043117
5844  036154  023040  044040  050117
5845  036162  042520  020122  044103
5846  036170  041505  000113
5847  036174  005015  051524  032124  MSG40:  .ASCIZ  <15><12>/TST43  DARK-LIGHT CHECK/
5848  036202  020063  042040  051101
5849  036210  026513  044514  044107
5850  036216  020124  044103  041505
5851  036224  000113
5852  036226  005015  051524  032124  MSG41:  .ASCIZ  <15><12>/TST43A  MIS-REGISTERED CARD TEST/
5853  036234  040463  020040  044515
5854  036242  026523  042522  044507
5855  036250  052123  051105  042105
5856  036256  041440  051101  020104
5857  036264  042524  052123     000
5858
5859          036272                  .EVEN
5860
5861                                  ;ERROR ITEMS MESSAGE TABLE
5862
5863  036272  052123  052101  051525  EM1:    .ASCII  "STATUS REGISTER (CDS) BIT07 NOT SET BY"
5864  036300  051040  043505  051511
5865  036306  042524  020122  041450
5866  036314  051504  020051  044502
5867  036322  030124  020067  047516
5868  036330  020124  042523  020124
5869  036336  054502
5870  036340  005015  047111  052111          .ASCIZ  <15><12>"INITIALIZATION PULSE"
5871  036346  040511  044514  040532
5872  036354  044524  047117  050040
5873  036362  046125  042523     000
5874
5875  036367     103  046117  046525  EM2:    .ASCII  "COLUMN COUNT REGISTER (CDC) NOT CLEARED BY"
5876  036374  020116  047503  047125
5877  036402  020124  042522  044507
5878  036410  052123  051105  024040
5879  036416  042103  024503  047040
5880  036424  052117  041440  042514
5881  036432  051101  042105  041040
5882  036440     131
5883  036441     015  044412  044516          .ASCIZ  <15><12>"INITIALIZATION PULSE"
5884  036446  044524  046101  055111
5885  036454  052101  047511  020116
5886  036462  052520  051514  000105
5887
5888  036470  052502  020123  042101  EM3:    .ASCII  "BUS ADDRESS REGISTER (CDA) NOT CLEARED BY"
5889  036476  051104  051505  020123
5890  036504  042522  044507  052123
5891  036512  051105  024040  042103
5892  036520  024501  047040  052117
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5893  036526  041440  042514  051101
5894  036534  042105  041040     131
5895  036541     015  044412  044516          .ASCIZ  <15><12>"INITIALIZATION PULSE"
5896  036546  044524  046101  055111
5897  036554  052101  047511  020116
5898  036562  052520  051514  000105
5899
5900  036570  052123  052101  051525  EM4:    .ASCIZ  "STATUS REGISTER CONTENTS INCORRECT"
5901  036576  051040  043505  051511
5902  036604  042524  020122  047503
5903  036612  052116  047105  051524
5904  036620  044440  041516  051117
5905  036626  042522  052103     000
5906
5907  036633     103  046117  046525  EM5:    .ASCII  "COLUMN COUNT REGISTER (CDC) NOT ABLE TO"
5908  036640  020116  047503  047125
5909  036646  020124  042522  044507
5910  036654  052123  051105  024040
5911  036662  042103  024503  047040
5912  036670  052117  040440  046102
5913  036676  020105  047524
5914  036702  005015  042502  046040          .ASCIZ  <15><12>"BE LOADED WITH ALL ONES"
5915  036710  040517  042504  020104
5916  036716  044527  044124  040440
5917  036724  046114  047440  042516
5918  036732  000123
5919
5920  036734  047503  052514  047115  EM6:    .ASCII  "COLUMN COUNT REGISTER (CDC) NOT CLEARED"
5921  036742  041440  052517  052116
5922  036750  051040  043505  051511
5923  036756  042524  020122  041450
5924  036764  041504  020051  047516
5925  036772  020124  046103  040505
5926  037000  042522     104
5927  037003     015  041012  020131          .ASCIZ  <15><12>"BY POWER CLEAR"
5928  037010  047520  042527  020122
5929  037016  046103  040505  000122
5930
5931  037024  052502  020123  042101  EM7:    .ASCII  "BUS ADDRESS REGISTER (CDA) NOT ABLE TO BE"
5932  037032  051104  051505  020123
5933  037040  042522  044507  052123
5934  037046  051105  024040  042103
5935  037054  024501  047040  052117
5936  037062  040440  046102  020105
5937  037070  047524  041040     105
5938  037075     015  046012  040517          .ASCIZ  <15><12>"LOADED WITH ALL ONES"
5939  037102  042504  020104  044527
5940  037110  044124  040440  046114
5941  037116  047440  042516  000123
5942
5943  037124  052502  020123  042101  EM10:   .ASCII  "BUS ADDRESS REGISTER (CDA) NOT CLEARED"
5944  037132  051104  051505  020123
5945  037140  042522  044507  052123
5946  037146  051105  024040  042103
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 5947  037154  024501  047040  052117
 5948  037162  041440  042514  051101
 5949  037170  042105
 5950  037172  005015  054502  050040          .ASCIZ  <15><12>"BY POWER CLEAR"
 5951  037200  053517  051105  041440
 5952  037206  042514  051101     000
 5953
 5954  037213     103  047117  051124  EM11:   .ASCII  "CONTROLLER READY DID NOT CLEAR ON"
 5955  037220  046117  042514  020122
 5956  037226  042522  042101  020131
 5957  037234  044504  020104  047516
 5958  037242  020124  046103  040505
 5959  037250  020122  047117
 5960  037254  005015  042522  042101          .ASCIZ  <15><12>"READING A CARD"
 5961  037262  047111  020107  020101
 5962  037270  040503  042122     000
 5963
 5964  037275     103  047117  051124  EM12:   .ASCII  "CONTROLLER READY DID NOT CLEAR BIT00"
 5965  037302  046117  042514  020122
 5966  037310  042522  042101  020131
 5967  037316  044504  020104  047516
 5968  037324  020124  046103  040505
 5969  037332  020122  044502  030124
 5970  037340     060
 5971  037341     015  047412  020106          .ASCIZ  <15><12>"OF STATUS REGISTER (CDS)"
 5972  037346  052123  052101  051525
 5973  037354  051040  043505  051511
 5974  037362  042524  020122  041450
 5975  037370  051504  000051
 5976
 5977  037374  047503  052116  047522  EM13:   .ASCIZ  "CONTROLLER DID NOT SET WITHIN 1 SECOND"
 5978  037402  046114  051105  042040
 5979  037410  042111  047040  052117
 5980  037416  051440  052105  053440
 5981  037424  052111  044510  020116
 5982  037432  020061  042523  047503
 5983  037440  042116     000
 5984
 5985  037443     105  051122  051117  EM14:   .ASCIZ  "ERROR (BIT15) SET IN STATUS REGISTER (CDS)"
 5986  037450  024040  044502  030524
 5987  037456  024465  051440  052105
 5988  037464  044440  020116  052123
 5989  037472  052101  051525  051040
 5990  037500  043505  051511  042524
 5991  037506  020122  041450  051504
 5992  037514  000051
 5993
 5994  037516  044502  020124  051117  EM15:   .ASCII  "BIT OR BITS SET IN STATUS REGISTER (CDS) THAT"
 5995  037524  041040  052111  020123
 5996  037532  042523  020124  047111
 5997  037540  051440  040524  052524
 5998  037546  020123  042522  044507
 5999  037554  052123  051105  024040
 6000  037562  042103  024523  052040
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6001  037570  040510     124
6002  037573     015  051412  047510          .ASCIZ  <15><12>"SHOULD NOT BE"
6003  037600  046125  020104  047516
6004  037606  020124  042502     000
6005
6006  037613     102  051525  020131  EM16:   .ASCII  "BUSY SET IN STATUS REGISTER (CDS)"
6007  037620  042523  020124  047111
6008  037626  051440  040524  052524
6009  037634  020123  042522  044507
6010  037642  052123  051105  024040
6011  037650  042103  024523
6012  037654  005015  052111  051440          .ASCIZ  <15><12>"IT SHOULD NOT BE"
6013  037662  047510  046125  020104
6014  037670  047516  020124  042502
6015  037676     000
6016
6017  037677     122  051505  047524  EM17:   .ASCII  "RESTORING CPU STATUS AFTER READING A CARD"
6018  037704  044522  043516  041440
6019  037712  052520  051440  040524
6020  037720  052524  020123  043101
6021  037726  042524  020122  042522
6022  037734  042101  047111  020107
6023  037742  020101  040503  042122
6024  037750  005015  046103  040505          .ASCIZ  <15><12>"CLEARED CONTROLLER READY IN STATUS REGISTER"
6025  037756  042522  020104  047503
6026  037764  052116  047522  046114
6027  037772  051105  051040  040505
6028  040000  054504  044440  020116
6029  040006  052123  052101  051525
6030  040014  051040  043505  051511
6031  040022  042524  000122
6032
6033  040026  047516  044440  052116  EM20:   .ASCIZ  "NO INTERRUPT OCCURRED"
6034  040034  051105  052522  052120
6035  040042  047440  041503  051125
6036  040050  042522  000104
6037
6038  040054  047101  044440  052116  EM21:   .ASCIZ  "AN INTERRUPT OCCURRED - SHOULD NOT HAVE"
6039  040062  051105  052522  052120
6040  040070  047440  041503  051125
6041  040076  042522  020104  020055
6042  040104  044123  052517  042114
6043  040112  047040  052117  044040
6044  040120  053101  000105
6045
6046  040124  047111  042524  051122  EM22:   .ASCIZ  "INTERRUPT ALREADY OCCURRED AT A HIGHER LEVEL"
6047  040132  050125  020124  046101
6048  040140  042522  042101  020131
6049  040146  041517  052503  051122
6050  040154  042105  040440  020124
6051  040162  020101  044510  044107
6052  040170  051105  046040  053105
6053  040176  046105     000
6054
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 6055  040201     103  047117  051124  EM23:   .ASCIZ  "CONTROLLER READY NOT SET"
 6056  040206  046117  042514  020122
 6057  040214  042522  042101  020131
 6058  040222  047516  020124  042523
 6059  040230  000124
 6060
 6061  040232  047111  042524  051122  EM24:   .ASCIZ  "INTERRUPT ALREADY OCCURRED AT A LOWER LEVEL"
 6062  040240  050125  020124  046101
 6063  040246  042522  042101  020131
 6064  040254  041517  052503  051122
 6065  040262  042105  040440  020124
 6066  040270  020101  047514  042527
 6067  040276  020122  042514  042526
 6068  040304  000114
 6069
 6070  040306  047101  044440  052116  EM25:   .ASCIZ  "AN INTERRUPT OCCURRED AT TWO DIFFERENT LEVELS"
 6071  040314  051105  052522  052120
 6072  040322  047440  041503  051125
 6073  040330  042522  020104  052101
 6074  040336  052040  047527  042040
 6075  040344  043111  042506  042522
 6076  040352  052116  046040  053105
 6077  040360  046105  000123
 6078
 6079  040364  051105  047522  020122  EM26:   .ASCII  "ERROR (BIT15) NOT SET IN STATUS REGISTER (CDS)"
 6080  040372  041050  052111  032461
 6081  040400  020051  047516  020124
 6082  040406  042523  020124  047111
 6083  040414  051440  040524  052524
 6084  040422  020123  042522  044507
 6085  040430  052123  051105  024040
 6086  040436  042103  024523
 6087  040442  005015  052111  051440          .ASCIZ  <15><12>"IT SHOULD BE"
 6088  040450  047510  046125  020104
 6089  040456  042502     000
 6090
 6091  040461     116  047117  042455  EM27:   .ASCII  "NON-EXISTANT MEMORY (BIT09) NOT SET IN"
 6092  040466  044530  052123  047101
 6093  040474  020124  042515  047515
 6094  040502  054522  024040  044502
 6095  040510  030124  024471  047040
 6096  040516  052117  051440  052105
 6097  040524  044440     116
 6098  040527     015  051412  040524          .ASCIZ  <15><12>"STATUS REGISTER (CDS) - IT SHOULD BE"
 6099  040534  052524  020123  042522
 6100  040542  044507  052123  051105
 6101  040550  024040  042103  024523
 6102  040556  026440  044440  020124
 6103  040564  044123  052517  042114
 6104  040572  041040  000105
 6105
 6106  040576  054105  042524  042116  EM30:   .ASCII  "EXTENDED MEMORY (BIT05) NOT SET IS STATUS"
 6107  040604  042105  046440  046505
 6108  040612  051117  020131  041050
```

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 6109  040620  052111  032460  020051
 6110  040626  047516  020124  042523
 6111  040634  020124  051511  051440
 6112  040642  040524  052524     123
 6113  040647     015  051012  043505          .ASCIZ  <15><12>"REGISTER (CDS)"
 6114  040654  051511  042524  020122
 6115  040662  041450  051504  000051
 6116
 6117  040670  054105  042524  042116  EM31:   .ASCII  "EXTENDED MEMORY (BIT04) NOT SET IN STATUS"
 6118  040676  042105  046440  046505
 6119  040704  051117  020131  041050
 6120  040712  052111  032060  020051
 6121  040720  047516  020124  042523
 6122  040726  020124  047111  051440
 6123  040734  040524  052524     123
 6124  040741     015  051012  043505          .ASCIZ  <15><12>"REGISTER (CDS)"
 6125  040746  051511  042524  020122
 6126  040754  041450  051504  000051
 6127
 6128  040762  047503  052116  047105  EM32:   .ASCII  "CONTENTS OF BUS ADDRESS REGISTER (CDA)"
 6129  040770  051524  047440  020106
 6130  040776  052502  020123  042101
 6131  041004  051104  051505  020123
 6132  041012  042522  044507  052123
 6133  041020  051105  024040  042103
 6134  041026  024501
 6135  041030  005015  047111  047503          .ASCIZ  <15><12>"INCORRECT"
 6136  041036  051122  041505  000124
 6137
 6138  041044  047503  052116  047105  EM33:   .ASCII  "CONTENTS OF COLUMN COUNT REGISTER (CDC)"
 6139  041052  051524  047440  020106
 6140  041060  047503  052514  047115
 6141  041066  041440  052517  052116
 6142  041074  051040  043505  051511
 6143  041102  042524  020122  041450
 6144  041110  041504     051
 6145  041113     015  044412  041516          .ASCIZ  <15><12>"INCORRECT"
 6146  041120  051117  042522  052103
 6147  041126     000
 6148
 6149  041127     122  040505  042504  EM34:   .ASCII  "READER OFF-LINE BUT CARD READER ERROR"
 6150  041134  020122  043117  026506
 6151  041142  044514  042516  041040
 6152  041150  052125  041440  051101
 6153  041156  020104  042522  042101
 6154  041164  051105  042440  051122
 6155  041172  051117
 6156  041174  005015  041050  052111          .ASCIZ  <15><12>"(BIT14) NOT SET IN STATUS REGISTER (CDS)"
 6157  041202  032061  020051  047516
 6158  041210  020124  042523  020124
 6159  041216  047111  051440  040524
 6160  041224  052524  020123  042522
 6161  041232  044507  052123  051105
 6162  041240  024040  042103  024523
```

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  6163  041246      000
  6164
  6165  041247      116  020117  051124  EM35:   .ASCII  "NO TRANSITION TO ON-LINE (BIT03) OCCURRED"
  6166  041254   047101  044523  044524
  6167  041262   047117  052040  020117
  6168  041270   047117  046055  047111
  6169  041276   020105  041050  052111
  6170  041304   031460  020051  041517
  6171  041312   052503  051122  042105
  6172  041320   005015  047111  051440          .ASCIZ  <15><12>"IN STATUS REGISTER (CDS)"
  6173  041326   040524  052524  020123
  6174  041334   042522  044507  052123
  6175  041342   051105  024040  042103
  6176  041350   024523     000
  6177
  6178  041353      103  047117  042524  EM36:   .ASCIZ  "CONTENTS OF STATUS REGISTER #2 (CDD) INCORRECT"
  6179  041360   052116  020123  043117
  6180  041366   051440  040524  052524
  6181  041374   020123  042522  044507
  6182  041402   052123  051105  021440
  6183  041410   020062  041450  042104
  6184  041416   020051  047111  047503
  6185  041424   051122  041505  000124
  6186
  6187  041432   047516  044440  052116  EM37:   .ASCIZ  "NO INTERRUPT WITH PROCESSOR AT LEVEL 0"
  6188  041440   051105  052522  052120
  6189  041446   053440  052111  020110
  6190  041454   051120  041517  051505
  6191  041462   047523  020122  052101
  6192  041470   046040  053105  046105
  6193  041476   030040     000
  6194
  6195  041501      104  052101  020101  EM40:   .ASCIZ  "DATA LATE (BIT10) NOT SET IN STATUS REGISTER (CDS)"
  6196  041506   040514  042524  024040
  6197  041514   044502  030524  024460
  6198  041522   047040  052117  051440
  6199  041530   052105  044440  020116
  6200  041536   052123  052101  051525
  6201  041544   051040  043505  051511
  6202  041552   042524  020122  041450
  6203  041560   051504  000051
  6204
  6205  041564   043117  026506  044514  EM41:   .ASCIZ  "OFF-LINE (BIT12) NOT SET IN STATUS REGISTER (CDS)"
  6206  041572   042516  024040  044502
  6207  041600   030524  024462  047040
  6208  041606   052117  051440  052105
  6209  041614   044440  020116  052123
  6210  041622   052101  051525  051040
  6211  041630   043505  051511  042524
  6212  041636   020122  041450  051504
  6213  041644   000051
  6214
  6215  041646   043117  026506  044514  EM42:   .ASCII  "OFF-LINE (BIT12) SET IN STATUS REGISTER"
  6216  041654   042516  024040  044502
```

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 6217  041662  030524  024462  051440
 6218  041670  052105  044140  020116
 6219  041676  052123  052101  051525
 6220  041704  051040  043505  051511
 6221  041712  042524     122
 6222  041715     015  020012  020055          .ASCIZ  <15><12>" - IT SHOULD NOT BE"
 6223  041722  052111  051440  047510
 6224  041730  046125  020104  047516
 6225  041736  020124  042502     000
 6226
 6227  041743     120  041511  020113  EM43:   .ASCIZ  "PICK CHECK (BIT13) NOT SET IN STATUS REGISTER #2 (CDD)"
 6228  041750  044103  041505  020113
 6229  041756  041050  052111  031461
 6230  041764  020051  047516  020124
 6231  041772  042523  020124  047111
 6232  042000  051440  040524  052524
 6233  042006  020123  042522  044507
 6234  042014  052123  051105  021440
 6235  042022  020062  041450  042104
 6236  042030  000051
 6237
 6238  042032  052123  041501  020113  EM44:   .ASCIZ  "STACK CHECK (BIT12) NOT SET IN STATUS REGISTER #2 (CDD)"
 6239  042040  044103  041505  020113
 6240  042046  041050  052111  031061
 6241  042054  020051  047516  020124
 6242  042062  042523  020124  047111
 6243  042070  051440  040524  052524
 6244  042076  020123  042522  044507
 6245  042104  052123  051105  021440
 6246  042112  020062  041450  042104
 6247  042120  000051
 6248
 6249  042122  047105  020104  043117  EM45:   .ASCII  "END OF FILE (BIT13) SET IN STATUS REGISTER (CDS)"
 6250  042130  043040  046111  020105
 6251  042136  041050  052111  031461
 6252  042144  020051  042523  020124
 6253  042152  047111  051440  040524
 6254  042160  052524  020123  042522
 6255  042166  044507  052123  051105
 6256  042174  024040  042103  024523
 6257  042202  005015  026440  044440          .ASCIZ  <15><12>" - IT SHOULD NOT BE"
 6258  042210  020124  044123  052517
 6259  042216  042114  047040  052117
 6260  042224  041040  000105
 6261
 6262  042230  042522  042101  041440  EM46:   .ASCII  "READ CHECK (BIT14) SET IN STATUS REGISTER (CDS)"
 6263  042236  042510  045503  024040
 6264  042244  044502  030524  024464
 6265  042252  051440  052105  044440
 6266  042260  020116  052123  052101
 6267  042266  051525  051040  043505
 6268  042274  051511  042524  020122
 6269  042302  041450  051504     051
 6270  042307     015  020012  020055          .ASCIZ  <15><12>" - IT SHOULD NOT BE"
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6271  042314  052111  051440  047510
6272  042322  046125  020104  047516
6273  042330  020124  042502     000
6274
6275  042335     110  050117  042520  EM47:   .ASCII  "HOPPER CHECK (BIT02) SET IN STATUS REGISTER (CDS)"
6276  042342  020122  044103  041505
6277  042350  020113  041050  052111
6278  042356  031060  020051  042523
6279  042364  020124  047111  051440
6280  042372  040524  052524  020123
6281  042400  042522  044507  052123
6282  042406  051105  024040  042103
6283  042414  024523
6284  042416  005015  026440  044440          .ASCIZ  <15><12>" - IT SHOULD NOT BE"
6285  042424  020124  044123  052517
6286  042432  042114  047040  052117
6287  042440  041040  000105
6288
6289  042444  047105  020104  043117  EM50:   .ASCII  "END OF FILE (BIT13) OF STATUS REGISTER (CDS) NOT SET"
6290  042452  043040  046111  020105
6291  042460  041050  052111  031461
6292  042466  020051  043117  051440
6293  042474  040524  052524  020123
6294  042502  042522  044507  052123
6295  042510  051105  024040  042103
6296  042516  024523  047040  052117
6297  042524  051440  052105
6298  042530  005015  026440  044440          .ASCIZ  <15><12>" - IT SHOULD BE"
6299  042536  020124  044123  052517
6300  042544  042114  041040  000105
6301
6302  042552  042522  042101  041440  EM51:   .ASCII  "READ CHECK (BIT14) OF STATUS REGISTER (CDS) NOT SET"
6303  042560  042510  045503  024040
6304  042566  044502  030524  024464
6305  042574  047440  020106  052123
6306  042602  052101  051525  051040
6307  042610  043505  051511  042524
6308  042616  020122  041450  051504
6309  042624  020051  047516  020124
6310  042632  042523     124
6311  042635     015  020012  020055          .ASCIZ  <15><12>" - IT SHOULD BE"
6312  042642  052111  051440  047510
6313  042650  046125  020104  042502
6314  042656     000
6315
6316  042657     110  050117  042520  EM52:   .ASCII  "HOPPER CHECK (BIT12) OF STATUS REGISTER (CDS) NOT SET"
6317  042664  020122  044103  041505
6318  042672  020113  041050  052111
6319  042700  031061  020051  043117
6320  042706  051440  040524  052524
6321  042714  020123  042522  044507
6322  042722  052123  051105  024040
6323  042730  042103  024523  047040
6324  042736  052117  051440  052105
```

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6325  042744  005015  026440  044440          .ASCIZ  <15><12>" - IT SHOULD BE"
6326  042752  020124  044123  052517
6327  042760  042114  041040  000105
6328
6329  042766  047105  020104  043117  EM53:   .ASCII  "END OF FILE (BIT13) OF STATUS REGISTER (CDS) DID NOT"
6330  042774  043040  046111  020105
6331  043002  041050  052111  031461
6332  043010  020051  043117  051440
6333  043016  040524  052524  020123
6334  043024  042522  044507  052123
6335  043032  051105  024040  042103
6336  043040  024523  042040  042111
6337  043046  047040  052117
6338  043052  005015  046103  040505          .ASCIZ  <15><12>"CLEAR WITH TRANSITION TO ON-LINE"
6339  043060  020122  044527  044124
6340  043066  052040  040522  051516
6341  043074  052111  047511  020116
6342  043102  047524  047440  026516
6343  043110  044514  042516     000
6344
6345  043115     122  040505  020104  EM54:   .ASCIZ  "READ CHECK (BIT14) NOT SET IN STATUS REGISTER #2 (CDD)"
6346  043122  044103  041505  020113
6347  043130  041050  052111  032061
6348  043136  020051  047516  020124
6349  043144  042523  020124  047111
6350  043152  051440  040524  052524
6351  043160  020123  042522  044507
6352  043166  052123  051105  021440
6353  043174  020062  041450  042104
6354  043202  000051
6355
6356  043204  040503  042122  051040  EM55:   .ASCIZ  "CARD READER ERROR BUT NOT BOTH CARD"
6357  043212  040505  042504  020122
6358  043220  051105  047522  020122
6359  043226  052502  020124  047516
6360  043234  020124  030070  044124
6361  043242  041440  051101  000104
6362
6363  043250  040503  042122  051040  EM56:   .ASCIZ  "CARD READER ERROR BUT NOT OFF-LINE"
6364  043256  040505  042504  020122
6365  043264  051105  047522  020122
6366  043272  052502  020124  047516
6367  043300  020124  043117  026506
6368  043306  044514  042516     000
6369
6370  043313     105  042116  047440  EM57:   .ASCIZ  "END OF FILE (BIT13) ERROR OF STATUS REGISTER (CDS)"
6371  043320  020106  044506  042514
6372  043326  024040  044502  030524
6373  043334  024463  042440  051122
6374  043342  051117  047440  020106
6375  043350  052123  052101  051525
6376  043356  051040  043505  051511
6377  043364  042524  020122  041450
6378  043372  051504  000051
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6379
6380  043376  040504  040524  042440  EM60:   .ASCIZ  "DATA ERROR (BIT11) OF STATUS REGISTER (CDS)"
6381  043404  051122  051117  024040
6382  043412  044502  030524  024461
6383  043420  047440  020106  052123
6384  043426  052101  051525  051040
6385  043434  046101  051511  042524
6386  043442  020122  041450  051504
6387  043450  000051
6388
6389  043452  040504  040524  046040  EM61:   .ASCIZ  "DATA LATE (BIT11) ERROR OF STATUS REGISTER (CDS)"
6390  043460  052101  020105  041050
6391  043466  052111  030461  020051
6392  043474  051105  047522  020122
6393  043502  043117  051440  040524
6394  043510  052524  020123  042522
6395  043516  044507  052123  051105
6396  043524  024040  042103  024523
6397  043532     000
6398
6399  043533     116  047117  042455  EM62:   .ASCII  "NON-EXISTANT MEMORY (BIT09) ERROR OF STATUS"
6400  043540  044530  052123  047101
6401  043546  020124  042515  047515
6402  043554  054522  024040  044502
6403  043562  030124  024471  042440
6404  043570  051122  051117  047440
6405  043576  020106  052123  052101
6406  043604  051525
6407  043606  005015  042522  044507          .ASCIZ  <15><12>"REGISTER (CDS)"
6408  043614  052123  051105  024040
6409  043622  042103  024523     000
6410
6411  043627     104  051511  051501  EM63:   .ASCIZ  "DISASTEROUS ERROR BUT NO ERROR BITS SET"
6412  043634  042524  047522  051525
6413  043642  042440  051122  051117
6414  043650  041040  052125  047040
6415  043656  020117  051105  047522
6416  043664  020122  044502  051524
6417  043672  051440  052105     000
6418
6419  043677     104  052101  020101  EM64:   .ASCII  "DATA PACKING (BIT01) OF STATUS REGISTER (CDS)"
6420  043704  040520  045503  047111
6421  043712  020107  041050  052111
6422  043720  030460  020051  043117
6423  043726  051440  040524  052524
6424  043734  020123  042522  044507
6425  043742  052123  051105  024040
6426  043750  042103  024523
6427  043754  005015  047516  020124          .ASCIZ  <15><12>"NOT SET - IT SHOULD BE"
6428  043762  042523  020124  020055
6429  043770  052111  051440  047510
6430  043776  046125  020104  042502
6431  044004     000
6432
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 6433  044005    123  047510  046125  EM65:   .ASCII  "SHOULD BE ADDRESSING BINARY DECK"
 6434  044012 020104  042502  040440
 6435  044020 042104  042522  051523
 6436  044026 047111  020107  044502
 6437  044034 040516  054522  042040
 6438  044042 041505     113
 6439  044045    015  050012  047522          .ASCIZ  <15><12>"PROGRAM DOES NOT AGREE"
 6440  044052 051107  046501  042040
 6441  044060 042517  020123  047516
 6442  044066 020124  043501  042522
 6443  044074 000105
 6444
 6445  044076 047503  052116  047105  EM66:   .ASCII  "CONTENTS OF STATUS REGISTER (CDS) INCORRECT"
 6446  044104 051524  047440  020106
 6447  044112 052123  052101  051525
 6448  044120 051040  043505  051511
 6449  044126 042524  020122  041450
 6450  044134 051504  020051  047111
 6451  044142 047503  051122  041505
 6452  044150    124
 6453  044151    015  020C12  020055          .ASCIZ  <15><12>" - SHOULD BE ZERO"
 6454  044156 044123  052517  042114
 6455  044164 041040  020105  042532
 6456  044172 047522     000
 6457
 6458  044175    117  042104  041040  EM67:   .ASCIZ  "ODD BUS ADDRESS CAUSED A TRAP IN NON-PACK MODE"
 6459  044202 051525  040440  042104
 6460  044210 042522  051523  041440
 6461  044216 052501  042523  020104
 6462  044224 020101  051124  050101
 6463  044232 044440  020116  047516
 6464  044240 026516  040520  045503
 6465  044246 046440  042117  000105
 6466
 6467                          ;ERROR ITEMS HEADER TA3LE
 6468
 6469  044254 024040  041520  020051  DH1:    .ASCIZ  " (PC)    (SP)    (CDS)    (CDD)    (PS)"
 6470  044262 020040  024040  050123
 6471  044270 020051  020040  041450
 6472  044276 051504  020051  020040
 6473  044304 041450  042104  020051
 6474  044312 020040  024040  051520
 6475  044320 000051
 6476  044322 024040  041520  020051  DH2:    .ASCIZ  " (PC)    (SP)    (CDS)    (CDD)    (CDC)    (PS)"
 6477  044330 020040  024040  050123
 6478  044336 020051  020040  041450
 6479  044344 051504  020051  020040
 6480  044352 041450  042104  020051
 6481  044360 020040  041450  041504
 6482  044366 020051  020040  024040
 6483  044374 051520  000051
 6484  044400 024040  041520  020051  DH3:    .ASCIZ  " (PC)    (SP)    (CDS)    (CDD)    (CDA)    (PS)"
 6485  044406 020040  024040  050123
 6486  044414 020051  020040  041490
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 6487  044422  051504  020051  020040
 6488  044430  041450  042104  020051
 6489  044436  020040  041450  040504
 6490  044444  020051  020040  024040
 6491  044452  051520  000051
 6492  044456  024040  041520  020051  DH4:    .ASCIZ  " (PC)    (SP)    (CDS)    (CDD)    (CDC)    (CDA)    (PS)"
 6493  044464  020040  024040  050123
 6494  044472  020051  020040  041450
 6495  044500  051504  020051  020040
 6496  044506  041450  042104  020051
 6497  044514  020040  041450  041504
 6498  044522  020051  020040  041450
 6499  044530  040504  020051  020040
 6500  044536  024040  051520  000051
 6501  044544  024040  041520  020051  DH5:    .ASCII  " (PC)    (SP)    (CDS)    (CDD)    (CDC)    (CDA)    (CDA)    (PS)"
 6502  044552  020040  024040  050123
 6503  044560  020051  020040  041450
 6504  044566  051504  020051  020040
 6505  044574  041450  042104  020051
 6506  044602  020040  041450  041504
 6507  044610  020051  020040  041450
 6508  044616  040504  020051  020040
 6509  044624  041450  040504  020051
 6510  044632  020040  024040  051520
 6511  044640     051
 6512  044641     015  020012  020040          .ASCIZ  <15><12>"                                                WAS      SHB"
 6513  044646  020040  020040  020040
 6514  044654  020040  020040  020040
 6515  044662  020040  020040  020040
 6516  044670  020040  020040  020040
 6517  044676  020040  020040  020040
 6518  044704  020040  020040  020040
 6519  044712  020040  040527  020123
 6520  044720  020040  020040  044123
 6521  044726  000102
 6522  044730  024040  041520  020051  DH6:    .ASCII  " (PC)    (SP)    (CDS)    (CDD)    (CDC)    (CDA)    (CDC)    (PS)"
 6523  044736  020040  024040  050123
 6524  044744  020051  020040  041450
 6525  044752  051504  020051  020040
 6526  044760  041450  042104  020051
 6527  044766  020040  041450  041504
 6528  044774  020051  020040  041450
 6529  045002  040504  020051  020040
 6530  045010  041450  041504  020051
 6531  045016  020040  024040  051520
 6532  045024     051
 6533  045025     015  020012  020040          .ASCIZ  <15><12>"                                                WAS      SHB"
 6534  045032  020040  020040  020040
 6535  045040  020040  020040  020040
 6536  045046  020040  020040  020040
 6537  045054  020040  020040  020040
 6538  045062  020040  020040  020040
 6539  045070  040527  020123  020040
 6540  045076  020040  020040  020040
```

```
045104  020040  020040  044123
045112  000102
045114  024040  041520  020051  DH7:    .ASCII  " (PC)   (SP)   (CDS)   (CDD)   (CDD)   (PS)"
045122  020040  051450  024520
045130  020040  024040  042103
045136  024523  020040  024040
045144  042103  024504  020040
045152  024040  042103  024504
045160  020040  020040  050050
045166  024523
045170  005015  020040  020040          .ASCIZ  <15><12>"                       WAS     SHB"
045176  020040  020040  020040
045204  020040  020040  020040
045212  020040  020040  020040
045220  020040  040527  020123
045226  020040  020040  044123
045234  000102
                                        .EVEN
                                ;ERROR ITEMS DATA TABLE
045236  001116  001174  001200  DT1:    $ERRPC,$REG6,$TMP0,$TMP1,$REG7,0
045244  001202  001176  000000
045252  001116  001174  001200  DT2:    $ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$REG7,0
045260  001202  001204  001176
045266  000000
045270  001116  001174  001200  DT3:    $ERRPC,$REG6,$TMP0,$TMP1,$TMP3,$REG7,0
045276  001202  001206  001176
045304  000000
045306  001116  001174  001200  DT4:    $ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$REG7,0
045314  001202  001204  001206
045322  001176  000000
045326  001116  001174  001200  DT5:    $ERRPC,$REG6,$TMP0,$TMP1,$TMP2,$TMP3,$TMP4,$REG7,0
045334  001202  001204  001206
045342  001210  001176  000000
045350  001116  001174  001200  DT6:    $ERRPC,$REG6,$TMP0,$TMP1,$TMP4,$REG7,0
045356  001202  001210  001176
045364  000000
```

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

045366  013703  001232  SETUP:  MOV     CDST,CDS                ;SET UP STATUS REGISTER POINTER
045372  013704  001234          MOV     CDCC,CDC                ;SET UP COLUMN COUNT REGISTER POINTER
045376  013705  001236          MOV     CDBA,CDA                ;SET UP BUS ADDRESS REGISTER POINTER
045402  013702  001244          MOV     INTVC,ADINT             ;LOAD ADDRESS OF INTERRUPT VECTOR
045406  013712  001246          MOV     INTVC+2,(ADINT)         ;SET UP CARD READER TRAP VECTOR
045412  005077  133630          CLR     @INTVC+2                ;TO HALT
045416  005037  001252          CLR     INTFLG                  ;INITIALIZE INTERRUPT FLAG
045422  005037  001254          CLR     TRFLG                   ;INITIALIZE TRACE FLAG
045426  013746  000340          MOV     PR7,-(SP)       ;;PUT NEW PS ON STACK
045432  012746  045440          MOV     #64$,-(SP)      ;;PUT NEW PC ON  STACK
045436  000002                  RTI                     ;; POP NEW PC AND PS
045440                  64$:
045440  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

;
;
```

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

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

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

045442  000000  BUFBEG: 0
000001                  .END
```

F16


```
ADINT =%000002          276#  1154*  1179*  1201   1216*  1224*  1249*  1259*  1273*  1298*  1334   1339*  1351*
                       1371*  1396*  1432   1437*  1449*  1469*  1494*  1530   1535*  1547*  1567*  1592*  1628
                       1633*  1645*  1660*  1685*  1721   1726*  1738*  1758*  1783*  1819   1824*  1836*  1856*
                       1881*  1917   1922*  1930*  1951*  1976*  1988   1998*  2005*  2030*  2051*  2058   2067*
                       2074*  2099*  2121*  2266*  2291*  2330   2337*  2347*  2439*  2464*  2945*  3157*  3182*
                       3221*  3246*  3282*  3307*  3373*  3398*  3421*  3446*  3501*  3526*  3548*  3573*  3656*
                       3681*  3704*  3729*  3812*  3837*  3859*  3884*  3965*  3991*  4028*  4156*  4181*  6588*
                       6589*
AGAIN   023424          4110   4112*  4126
ALPCD   027600          2419   4981*
ALPCDP  030040          5065*
ALPEND  030036          2420   5060*
ALPENP  030157          5144*
ALP1    012374          2414   2419*
BEGIN   002170           295    868*   907
BINCD   030160          2415   5148*
BINCDP  030420          5233*
BINEND  030416          2416   5227*
BINENP  030537          5312*
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*  4600
BIT11   = 004000         237*  4653
BIT12   = 010000         236*  2909
BIT13   = 020000         235*  4607
BIT14   = 040000         234*  4635
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   012702          2478*  2479   2484
BKGND1  012714          2481*  2482
BPTVEC= 000014           265*
BUFBEG  045442          1057   1109   1196   1251   1329   1427   1525   1623   1716   1814   1912   1982   2047
                        2324   2351   2353   2364   2466   2805   3085   3463   3590   3629   3746   3785   3901
                        4009   4086   4146   4407   6618#
BUFEND  015320          2503*  2504*  2505*  2506   2508   2662*  2663*  2664   2666   2967#
BYPASS  023626          4122   4156#
CARDIM  025736          4374*  4375*  4376   4427   4498#
```

```
CDA     =%000005        279#    955     1031*   1032    1041    1057*   1109*   1196*   1251*   1329*   1427*   1525*   1623*
                        1716*   1814*   1912*   1982*   2047*   2116*   2146    2213*   2215*   2217*   2219    2231*   2236
                        2248*   2250*   2252*   2254    2324*   2351    2364*   2470*   2506    2664    2806*   3085*   3463*
                        3590*   3629*   3746*   3785*   3901*   4009*   4086*   4146*   4409*   4596    6587*
CDBA      001236        395#    6587
CDC     =%000004        278#    951     1008*   1009    1018    1056*   1108*   1195*   1250*   1328*   1426*   1524*   1622*
                        1715*   1713*   1911*   1981*   2046*   2115*   2151    2161*   2163*   2165*   2167    2179*   2184
                        2196*   2198*   2200*   2202    2321*   2363*   2469*   2480    2498    2658    2804*   3084*   3462*
                        3589*   3628*   3745*   3784*   3900*   4008*   4085*   4145*   4408*   4595    6586*
CDCC      001234        394#    6586
CDCNT     015332        2411*   2543    2546*   2586*   2691    2696    2699*   2723*   2815    2827*   2828    2830*   2841
                        2851*   2852    2972#
CDDB      001240        396#    959     962     970     2512    2547    2561    2590    3645    3648    3801    3804    4102
                        4105    4594
CDPK0     025740        4376*   4378*   4380*   4386*   4499#
CDPK1     025741        4379*   4381*   4382*   4383*   4384*   4389*   4418    4500#
CDREAD    012700        2473    2475    2477#
CDS     =%000003        277#    947     985*    986     992*    993     998*    999     1013    1017*   1022    1036    1040*
                        1045    1073*   1074    1078    1088    1091    1095    1107*   1110*   1111    1129    1140    1144
                        1197*   1198    1205*   1208    1212    1215*   1252*   1253    1258*   1330*   1331    1338*   1347
                        1350*   1428*   1429    1436*   1445    1448*   1526*   1527    1534*   1543    1546*   1624*   1625
                        1632*   1641    1644*   1717*   1718    1725*   1734    1737*   1815*   1816    1823*   1832    1835*
                        1913*   1914    1921*   1926    1929*   1983*   1992*   1996*   2048*   2065*   2117*   2122    2126
                        2130    2134    2138    2142    2326*   2327    2336*   2343    2346*   2368*   2369    2471*   2477*
                        2478    2481    2487    2490    2494    2618    2620    2631    2635    2639    2643    2647    2650
                        2655    2692*   2748    2750    2757    2759    2770    2774    2778    2782    2785    2807*   2816*
                        2931    2933    2937    2941    2949    3087*   3088    3092    3096    3100    3118    3122    3126
                        3135    3139    3143    3147    3198*   3202    3209    3213    3217    3262*   3266    3270    3274
                        3278    3328    3332    3336    3340    3357    3361    3365    3369    3414*   3464*   3468    3485
                        3489    3493    3497    3542*   3591*   3595    3618    3622    3624    3630*   3631    3633    3637
                        3641    3652    3697*   3747*   3751    3776    3778    3780    3786*   3787    3789    3793    3797
                        3808    3853*   3902*   3906    3935    3944    3949    3954    3958    4007*   4010*   4016    4020
                        4024    4032    4036    4040    4045    4055    4059    4077    4079    4081    4087*   4088    4090
                        4094    4098    4109    4137    4139    4141    4147*   4149    4151    4197*   4404*   4410*   4412
                        4414    4434    4437    4441    4508    4510*   4511    4518    4593    6585*
CDST      001232        391#    6585
CD1000    001266        410#    3020*   3063*   3918
CKERR     025454        4415    4434#
CKERR0    025666        4452    4483#
CKERR1    025476        4435    4441#
CKERR2    025522        4442    4444    4447#
CKERR3    025466        4437#   4438
CKFAIL    025526        4419    4428    4450#
CKLOOP    025272        4399#   4423    4432    4448    4490
CKLOP1    025222        4386#   4391
CKLOP2    025414        4417    4424#   4431    4492
CKLOP3    025370        4418#   4422    4446    4493
CKLP1     025352        4412#   4413
CKNOHD    025560        4454    4457#
CKNOPK    025632        4464    4472#
CKOFFL    025772         945    1055    1106    4507    4518#   4524
CKOVR     025240        4387    4390#
CKOVR1    025642        4471    4477#
CKREAD    025326        4401    4403    4406#
```

```
CKRF    001262  408#
CKSAME  024624  322     4325#   4364
CKSTRT  025252  4395#   4439
CLCNT   015334  2410*   2527*   2529    2676*   2678    2832*   2833    2835*   2849*   2973#   4406*   4420*   4421
                4429*   4430    4458*   4459    4462*   4486*   4488
CONTC   016656  3204    3209#
CONTD   012416  2418    2422#
CONT20  010460  1993    1997#
CONT21  010770  2062    2065#
CONT7   003760  1207    1216#
COUNT   001250  402#    1072*   1082*   1114*   1131*   1984*   1985*   2511*   2525*   2668*   2674*   2756*
COUNTG  001264  409#
CRLF    030553  914     918     3017    3076    3083    3116    3132    3201    3324    3355    3417    3483    3544
                3616    3700    3775    3855    3932    3939    4052    4076    4120    4132    4135    4200    4457
                5317#
DATRST  015306  2653    2768    2962#
DATST   012314  2382    2408#   2960    2963
DCNT1   012462  2429    2436#
DDISP = 177570  180#    357
DECK    014574  2417*   2421*   2825#
DECKCK  015262  2929    2932    2956#
DERCNT  015340  2480*   2483*   2975#
DERFLG  025742  4377*   4388*   4399*   4405*   4416    4443    4445    4463    4501#
DH1     044254  432     455     495     503     510     517     525     533     541     648     656     853     6469#
DH2     044322  440     463     471     6476#
DH3     044400  448     479     487     6484#
DH4     044456  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     6492#
DH5     044544  630     6501#
DH6     044730  639     6522#
DH7     045114  671     6543#
DISPAT  027572  4957    4964#
DISPLA  001140  357#    903*    3013*   3057*   4250*   4360*   4599*   4664*
DISPRE  000174  291#    903     3013    3057    4250    4360
DONE6   003450  1141    1144#
DSWR = 177570   179#    356
DT1     045236  433     456     496     504     511     518     526     534     542     649     657     854     6562#
DT2     045252  441     464     472     6564#
DT3     045270  449     480     488     6567#
DT4     045306  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     6570#
DT5     045326  632     641     6573#
DT6     045350  673     6576#
DUMMY = 000000  275#    2825
EMTVEC= 000030  268#    876*    877*    2986*   2987*   3030*   3031*   4223*   4224*   4333*   4334*
EM1     036272  430     5863#
EM10    037124  485     5943#
EM11    037213  493     5954#
EM12    037275  501     5964#
EM13    037374  509     5977#
EM14    037443  516     5985#
EM15    037516  523     621     5994#
```

```
EM16    037613          531    6006#
EM17    037677          539    6017#
EM2     036367          438    5875#
EM20    040026          547    6033#
EM21    040054          554    6038#
EM22    040124          561    6046#
EM23    040201          568    6055#
EM24    040232          575    6061#
EM25    040306          582    6070#
EM26    040364          589    6079#
EM27    040461          597    6091#
EM3     036470          446    5888#
EM30    040576          605    6106#
EM31    040670          613    6117#
EM32    040762          628    6128#
EM33    041044          637    6138#
EM34    041127          646    6149#
EM35    041247          654    6165#
EM36    041353          669    6178#
EM37    041432          678    6187#
EM4     036570          454    5900#
EM40    041501          685    6195#
EM41    041564          693    6205#
EM42    041646          701    6215#
EM43    041743          709    6227#
EM44    042032          717    6238#
EM45    042122          725    6249#
EM46    042230          733    6262#
EM47    042335          741    6275#
EM5     036633          461    5907#
EM50    042444          749    6289#
EM51    042552          757    6302#
EM52    042657          765    6316#
EM53    042766          773    6329#
EM54    043115          782    6345#
EM55    043204          790    6356#
EM56    043250          797    6363#
EM57    043313          804    6370#
EM6     036734          469    5920#
EM60    043376          812    6380#
EM61    043452          819    6389#
EM62    043533          827    6399#
EM63    043627          662    6411#
EM64    043677          835    6419#
EM65    044005          843    6433#
EM66    044076          851    6445#
EM67    044175          859    6458#
EM7     037024          477    5931#
ENDCK   012266         2380#
ERCD11  015642          315    3022#
ERCD12  016146         3064    3067#
ERFLG   001260          407#   2412*  2820   2822*  4398*  4453   4455*
ERRVEC= 000004          261#   4640   4641*  4643*  4646*
ER12CD  016134         3021    3064#  4206
```

```
ER1200  015342          326   2978#
GNS   = ****** U        290   4917   4918   4919   4920   4921
HEADIN  002522          911    919#
HOOK1   015170         2919   2926#
INIT    025744         1153   1223   1272   1370   1468   1566   1659   1757   1855   1950   2004   2073   2265
                       2362   2436   3075   3112   3156   3351   3478   3609   3763   3927   3940   4071   4395
                       4507#
INTFLG  001252          403#  1341   1343   1354   1356*  1363   1439   1441   1452   1454*  1461   1537   1539
                       1550   1552*  1559   1635   1637   1648   1650*  1652   1728   1730   1741   1743*  1750
                       1826   1828   1839   1841*  1848   1933   1935*  1942   6591*
INTVC   001244          400#  6588   6589   6590*
IOTVEC= 000020          266#   874*   875*  2984*  2985*  3028*  3029*  4221*  4222*  4331*  4332*
ISR     012750         2491   2494#
ISRBE   013150         2525   2535#
ISRDE   013176         2518   2521   2543#
ISRDE4  013474         2588   2607#
ISRD1   013204         2545#  2582
ISRD2   013410         2544   2587#
ISRER   013510         2497   2614#
ISRE1   013516         2614   2618#
ISRE2   013554         2619   2631#
ISRE3   013564         2623   2632   2635#
ISRLP   013042         2512#  2530   2533
ISRNC   013034         2507   2511#  2629
ISRNX   013154         2536#
ISRNX1  013172         2538   2540#
ISRRT   013076         2519   2522#  2573   2575   2610
ISRST   013634         2616   2628   2651   2653#
LASTCD  014650         2625   2764   2802   2840#
LOOP5   003220         1075   1078#  1083
LOOP6   003442         1140#
LOOP6A  003412         1129#  1132
LOOP6B  003430         1130   1135#
LSTCD1  014664         2842#  2844
MDATA   031305         2408   5385#
MLOGIC  031256          919    929    932   5380#
MLOOP   031454         4301   5407#
MPATS   031527         4367   5416#
MSG1    031576         3130   3323   3416   3543   3615   3699   3774   3854   3930   4050   4075   4134   5424#
MSG10   032570         4125   5517#
MSG11   032634         5523#
MSG12   032706         4073   5530#
MSG13   033053         2823   5548#
MSG14   033132         2421   5556#
MSG15   033143         2417   5558#
MSG16   033154         5560#
MSG17   033175         4522   5563#
MSG18   033410         4521   5588#
MSG19   033442         4456   5593#
MSG2    031632          916   3115   3131   3354   3482   3612   3931   3938   4051   5429#
MSG20   033506         3929   5599#
MSG21   033552         3937   5605#
MSG22   033605         3078   5610#
MSG23   034223         4255   5659#
```

K16


```
MSG24   034472          4261    4392    5690#
MSG25   034574          4370    5703#
MSG26   034745          4130    5723#
MSG27   035064          4133    5738#
MSG28   035236          4155    5758#
MSG29   035306          4199    5766#
MSG3    031706          3114    3200    3765    5437#
MSG30   035373          4112    5776#
MSG31   035463           915    5787#
MSG32   035645          3077    5807#
MSG33   035675          3113    5812#
MSG34   035724          3199    5816#
MSG35   035765          3352    5822#
MSG36   036020          3479    5827#
MSG37   036053          3610    5832#
MSG38   036104          3764    5837#
MSG39   036140          3928    5842#
MSG4    031741          1357    1455    1553    1744    1842    1936    5442#
MSG40   036174          4072    5847#
MSG41   036226          4129    5852#
MSG5    031774          3353    3611    5447#
MSG6    032045          3415    3698    4049    4198    5454#
MSG7    032111          3480    5461#
MSG8    032270          3613    5481#
MSG9    032362          3766    5492#
M1000E  031401          3061    5398#
M1200E  031333          3018    5390#
NOHEAD  014572          2821    2824#
NOTRP   002542           924#    935
NOTRP1  012424          2424#   2431
NXCRD   014710          2531    2535    2680    2684    2849#
OFFSET  015316          2468*   2794    2796*   2800*   2966#
ONINT   015250          2945    2949#
ONLINE  015204          2927    2931#
PAKSET  014522          2476    2539    2812#
PC      =%000007         192#    909*    945*   1055*   1106*   1153*   1223*   1272*   1370*   1468*   1566*   1659*   1757*
                        1855*   1950*   2004*   2073*   2265*   2362*   2436*   2476*   2531*   2535*   2539*   2589*   2625*
                        2680*   2684*   2726*   2764*   2802*   2817*   2837*   2846*   2854*   2874*   2877*   2896*   3066*
                        3075*   3112*   3156*   3351*   3478*   3609*   3763*   3927*   3940*   4071*   4254*   4369*   4395*
                        4507*   4514*   4520*   4565*   4609*   4707*   4714*   4721*   4735*   4737*   4956    6597*
PIRQ    = 177772         178#
PIRQVE= 000240           272#
POWMES  031124          4955    5363#
PROC    001256           405#   1067*   1084    1124*   1136
PR0     = 000000         195#   1068    1125    1977    2052
PR1     = 000040         196#
PR2     = 000100         197#
PR3     = 000140         198#
PR4     = 000200         199#
PR5     = 000240         200#
PR6     = 000300         201#
PR7     = 000340         202#    925     2425    6593
PS      = 177776         175#    176
PSR     013640          2492    2655#
```

```
PSRBE   014000          2675    2684#
PSRDE   014052          2670    2696#
PSRDE3  014244          2725    2738#
PSRD1   014060          2698#   2719
PSRD2   014202          2697    2724#
PSRER   014256          2657    2744#
PSRE1   014264          2744    2748#
PSRE2   014322          2749    2757#
PSRE3   014362          2758    2770#
PSRE4   014372          2762    2771    2774#
PSRLP   013722          2669#   2679    2682    2788
PSRNC   013714          2665    2668#   2766
PSRNX   014004          2685#
PSRNX1  014046          2687    2693#
PSRRT   013726          2671#   2710    2712    2741
PSRST   014432          2746    2786    2788#
PSW   = 177776           176#
PTOFF   015336          2974#
PWRVEC= 000024           267#    880*    881*    2990*   2991*   3034*   3035*   4227*   4228*   4337*   4338*   4928*   4929*
                        4937*   4952*   4953*
RESTRT  002534           922#   2385    2959
RESVEC= 000010           262#    887*    894*    2366*   2367*   2997*   3004*   3041*   3048*   4234*   4241*   4344*   4351*
RETRNX  024622          4259*   4260*   4303    4305    4306#
RETURN  027576           907*   3064*   4298*   4364*   4964    4967#
R0    =%000000           183#   2164*   2165    2167    2170    2181*   2182    2216*   2217    2219    2222    2233*   2234
                        2466*   2470    2503    2517    2520    2545    2552    2555    2566    2569    2602    2606    2662
                        2669    2698    2700    2706    2733    2737    2805*   2806    2885*   2893*   2896    4407*   4409
                        4418    4424    4466    4470    4472    4476    4537    4538*   4539*   4546*   4547*   4548*   4549*
                        4550*   4551    4556    4561*   4563*   4567    4569    4691    4692*   4693    4696*   4836    4846*
                        4850    4866    4867    4880*   4900    4901*   4902    4903*   4904*   4905*   4906*   4930    4951*
R1    =%000001           184#   2465*   2515    2520    2522    2524*   2532    2536    2550    2555    2557*   2558    2560*
                        2564    2569    2571*   2572    2574*   2577*   2578    2580*   2581    2583*   2584*   2585*   2593
                        2597    2606    2669    2671    2673*   2681    2685    2690*   2691*   2700    2702*   2703    2705*
                        2706    2708*   2709    2711*   2714*   2715    2717*   2718    2720*   2721*   2722*   2728    2737
                        2814*   2815*   4385*   4389    4390*   4837    4850*   4851    4855    4879*   4931    4950*
R2    =%000002           185#   4838    4849*   4853*   4856    4863*   4864*   4865    4870*   4878*   4932    4949*
R3    =%000003           186#   4777    4786*   4792*   4793*   4796*   4801*   4802*   4803    4812*   4839    4847*   4848*
                        4862*   4865*   4874*   4875*   4877*   4933    4948*
R4    =%000004           187#   2182*   4778    4780*   4781*   4782*   4783    4784*   4798    4800*   4808*   4811*   4934
                        4947*
R5    =%000005           188#   2234*   4779    4785*   4787*   4789*   4790*   4791*   4792    4810*   4840    4842*   4844*
                        4851*   4855*   4870    4876*   4935    4946*
R6    =%000006           189#    191     869*    870*    871    2979*   2980*   2981    3023*   3024*   3025    4216*   4217*
                        4218    4326*   4327*   4328
R7    =%000007           190#    192
SECN    022672          3966#   4029
SETUP   045366           909    3066    4254    4369    6585#
SET1    010224          1934    1942#
SET2    007564          1840    1848#
SET3    007106          1742    1750#
SET4    006430          1649    1652#
SET5    005766          1551    1559#
SET6    005310          1453    1461#
SET7    004632          1355    1363#
```

M16

SIZE 015314
SP =%000006

2467* 2469 2504 2505 2511 2663 2668 2794* 2798 2804 2840 2965*
191* 873* 888* 889* 893* 897* 898* 904 905 906 925* 926* 936*
937* 1059* 1060* 1063* 1064* 1066 1067 1068* 1069* 1084* 1085* 1116* 1117*
1120* 1121* 1123 1124 1125* 1126* 1136* 1137* 1156* 1157* 1160* 1161* 1163
1164 1166* 1167* 1171* 1172* 1175* 1176* 1178 1179 1181* 1182* 1185* 1186*
1188 1189 1191* 1192* 1201* 1202* 1211 1226* 1227* 1230* 1231* 1233 1234
1236* 1237* 1241* 1242* 1245* 1246* 1248 1249 1257 1275* 1276* 1279* 1280*
1282 1283 1285* 1286* 1290* 1291* 1294* 1295* 1297 1298 1300* 1301* 1304*
1305* 1307 1308 1310* 1311* 1314* 1315* 1318* 1319* 1321 1322 1324* 1325*
1334* 1335* 1353 1358* 1373* 1374* 1377* 1378* 1380 1381 1383* 1384* 1388*
1389* 1392* 1393* 1395 1396 1398* 1399* 1402* 1403* 1405 1406 1408* 1409*
1412* 1413* 1416* 1417* 1419 1420 1422* 1423* 1432* 1433* 1451 1456* 1471*
1472* 1475* 1476* 1478 1479 1481* 1482* 1486* 1487* 1490* 1491* 1493 1494
1496* 1497* 1500* 1501* 1503 1504 1506* 1507* 1510* 1511* 1514* 1515* 1517
1518 1520* 1521* 1530* 1531* 1549 1554* 1569* 1570* 1573* 1574* 1576 1577
1579* 1580* 1584* 1585* 1588* 1589* 1591 1592 1594* 1595* 1598* 1599* 1601
1602 1604* 1605* 1608* 1609* 1612* 1613* 1615 1616 1618* 1619* 1628* 1629*
1647 1662* 1663* 1666* 1667* 1669 1670 1672* 1673* 1677* 1678* 1681* 1682*
1684 1685 1687* 1688* 1691* 1692* 1694 1695 1697* 1698* 1701* 1702* 1705*
1706* 1708 1709 1711* 1712* 1721* 1722* 1740 1745* 1760* 1761* 1764* 1765*
1767 1768 1770* 1771* 1775* 1776* 1779* 1780* 1782 1783 1785* 1786* 1789*
1790* 1792 1793 1795* 1796* 1799* 1800* 1803* 1804* 1806 1807 1809* 1810*
1819* 1820* 1838 1843* 1858* 1859* 1862* 1863* 1865 1866 1868* 1869* 1873*
1874* 1877* 1878* 1880 1881 1883* 1884* 1887* 1888* 1890 1891 1893* 1894*
1897* 1898* 1901* 1902* 1904 1905 1907* 1908* 1917* 1918* 1932 1937* 1953*
1954* 1957* 1958* 1960 1961 1963* 1964* 1968* 1969* 1972* 1973* 1975 1976
1977* 1978* 1988* 1989* 1995 2007* 2008* 2011* 2012* 2014 2015 2017* 2018*
2022* 2023* 2026* 2027* 2029 2030 2032* 2033* 2036* 2037* 2039 2040 2042*
2043* 2050 2052* 2053* 2058* 2059* 2063 2076* 2077* 2080* 2081* 2083 2084
2086* 2087* 2091* 2092* 2095* 2096* 2098 2099 2101* 2102* 2105* 2106* 2108
2109 2111* 2112* 2119 2268* 2269* 2272* 2273* 2275 2276 2278* 2279* 2283*
2284* 2287* 2288* 2290 2291 2293* 2294* 2297* 2298* 2300 2301 2303* 2304*
2307* 2308* 2311* 2312* 2314 2315 2317* 2318* 2330* 2331* 2350 2374 2425*
2426* 2432* 2433* 2441* 2442* 2445* 2446* 2448 2449 2451* 2452* 2456* 2457*
2460* 2461* 2463 2464 2595* 2597* 2602* 2728* 2733* 2828* 2833* 2868 2869
2801* 2888* 2889* 2901* 2902* 2905 2906* 2907 2908* 2913* 2914* 2953 2962
2983* 2998* 2999* 3003* 3007* 3008* 3014 3015 3016 3027* 3042* 3043* 3047*
3051* 3052* 3058 3059 3060 3159* 3160* 3163* 3164* 3166 3167 3169* 3170*
3174* 3175* 3178* 3179* 3181 3182 3184* 3185* 3188* 3189* 3191 3192 3194*
3195* 3223* 3224* 3227* 3228* 3230 3231 3233* 3234* 3238* 3239* 3242* 3243*
3245 3246 3248* 3249* 3252* 3253* 3255 3256 3258* 3259* 3265 3284* 3285*
3288* 3289* 3291 3292 3294* 3295* 3299* 3300* 3303* 3304* 3306 3307 3309*
3310* 3313* 3314* 3316 3317 3319* 3320* 3327 3375* 3376* 3379* 3380* 3382
3383 3385* 3386* 3390* 3391* 3394* 3395* 3397 3398 3400* 3401* 3404* 3405*
3407 3408 3410* 3411* 3420 3423* 3424* 3427* 3428* 3430 3431 3433* 3434*
3438* 3439* 3442* 3443* 3445 3446 3448* 3449* 3452* 3453* 3455 3456 3458*
3459* 3467 3503* 3504* 3507* 3508* 3510 3511 3513* 3514* 3518* 3519* 3522*
3523* 3525 3526 3528* 3529* 3532* 3533* 3535 3536 3538* 3539* 3547 3550*
3551* 3554* 3555* 3557 3558 3560* 3561* 3565* 3566* 3569* 3570* 3572 3573
3575* 3576* 3579* 3580* 3582 3583 3585* 3586* 3594 3658* 3659* 3662* 3663*
3665 3666 3668* 3669* 3673* 3674* 3677* 3678* 3680 3681 3683* 3684* 3687*
3688* 3690 3691 3693* 3694* 3703 3706* 3707* 3710* 3711* 3713 3714 3716*
3717* 3721* 3722* 3725* 3726* 3728 3729 3731* 3732* 3735* 3736* 3738 3739
3741* 3742* 3750 3814* 3815* 3818* 3819* 3821 3822 3824* 3825* 3829* 3830*

```
                    3833*  3834*  3836   3837   3839*  3840*  3843*  3844*  3846   3847   3849*  3850*  3858
                    3861*  3862*  3865*  3866*  3868   3869   3871*  3872*  3876*  3877*  3880*  3881*  3883
                    3884   3886*  3887*  3890*  3891*  3893   3894   3896*  3897*  3905   3968*  3969*  3972*
                    3973*  3975   3976   3978*  3979*  3983*  3984*  3987*  3988*  3990   3991   3993*  3994*
                    3997*  3998*  4000   4001   4003*  4004*  4014   4030   4158*  4159*  4162*  4163*  4165
                    4166   4168*  4169*  4173*  4174*  4177*  4178*  4180   4181   4183*  4184*  4187*  4188*
                    4190   4191   4193*  4194*  4203   4220*  4235*  4236*  4240*  4244*  4245*  4251   4252
                    4253   4267*  4268*  4271*  4272*  4274   4275   4277*  4278*  4284*  4285*  4286*  4289*
                    4291   4292   4294*  4295*  4330*  4345*  4346*  4350*  4354*  4355*  4361   4362   4363
                    4459*  4466*  4472*  4478*  4481*  4537*  4542*  4563   4567*  4591   4592   4604   4640*
                    4643   4645   4646   4663   4665*  4691*  4692   4693*  4695   4696   4697*  4699   4701
                    4703   4708   4710*  4712*  4720*  4724   4728   4729   4733   4769*  4770   4771   4772*
                    4777*  4778*  4779*  4785   4810   4811   4812   4813*  4814*  4836*  4837*  4838*  4839*
                    4840*  4841*  4842   4845*  4858   4860*  4862   4872   4874   4876   4877   4878   4879
                    4880   4882*  4883*  4900*  4901   4930*  4931*  4932*  4933*  4934*  4935*  4936   4942*
                    4946   4947   4948   4949   4950   4951   4956*  4958*  6593*  6594*
SPACE   030545      2601   2727   2732   2826   2831   2836   4461   4465   4477   4480   5315#
SRETRN  014436      2540   2693   2794#  2797   2801
SRETR1  014456      2795   2798#
SRETR3  014466      2800#  2803
SRETR4  014476      2799   2802#
SRVC    012730      2439   2487#
STACK = 001100       172#   873   2983   3027   4220   4330
STADDR  030616       913   5326#
STKLMT= 177774       177#
STMES   030556       912   3067   4300   4366   5319#
SWR     001136       356#   900    902*   934   2381   2413   2430   2472   2474   2537   2587   2607   2686
                    2724   2738   2753   2909   2926   2957   3010   3012*  3054   3056*  4247   4249*  4259
                    4264   4357   4359*  4374   4400   4402   4451   4483   4491   4600   4607   4612   4635
                    4653
SWREG   000176       292#   902   3012   3056   4249   4359
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*   2994*   2995*   3038*   3039*   4231*   4232*   4341*   4342*
TCRLF  = 000200         4701    4740#
TEMP1    015322         2840*   2843*   2968#
TEMP2    015324         2841*   2842*   2845    2969#
TEND     015330         2416*   2420*   2522    2558    2581    2671    2689*   2703    2718    2813*   2971#
TESTX    024100          318    4215#
THT    = 000011         4699    4739#
TINA21   010764         2051    2063#
TINTC    016652         3157    3206#
TINTCA   017120         3221    3265#
TINTCB   017402         3282    3327#
TINTD    017764         3373    3420#
TINTDA   020214         3421    3467#
TINTE    020544         3501    3547#
TINTEA   020774         3548    3594#
TINTF    021424         3656    3703#
TINTFA   021654         3704    3750#
TINTG    022270         3812    3858#
TINTGA   022520         3859    3905#
TINTH    024064         4156    4203#
TINTI    023120         3965    4014#
TINTIA   023156         4028    4030#
TINT10   004150         1224    1256#
TINT11   004556         1273    1347#
TINT12   005234         1371    1445#
TINT13   005712         1469    1543#
TINT14   006370         1567    1641#
TINT15   007032         1660    1734#
TINT16   007510         1758    1832#
TINT17   010150         1856    1926#
TINT20   010452         1951    1994#
TINT21   010726         2005    2050#
TINT22   011240         2074    2119#
TINT31   012146         2266    2343#
TINT7    003740         1154    1208#
TKVEC  = 000060          270#
TLOPC    016642         3202#   3203
TLOPG    021720         3776#   3777
TLOPGA   021726         3778#   3779
TLOPGB   021756         3787#   3788
TLOPH    023304         4077#   4078
TLOPHA   023312         4079#   4080
TLOPHB   023342         4088#   4089
TLOPHC   023550         4137#   4138
TLOPHD   023556         4139#   4140
TLOPHE   023606         4149#   4150
TOTCRD   025734         4396*   4411*   4478    4497#
TOTERR   025732         4397*   4450*   4481    4496#
TPVEC  = 000064          271#
TRACE  = 000360          281#    936     2432
TRAPVE= 000034           269#    878*    879*   2988*   2989*   3032*   3033*   4225*   4226*   4335*   4336*
```

```
TRAPX   002566            923     932#
TRFLG   001254            404#    922     2384*   2422    2956*   6592*
TRP1    012440           2423    2430#
TRTRAP  001242            309     399#
TRTVEC= 000014            264#
TSTART  015326           2415*   2419*   2465    2524    2572    2578    2583    2673    2688*   2709    2715    2720    2812*
                         2970#
TSTM10  023256           3920    4060    4063#
TSTM12  022544           3919    3922#
TST1    002620            921     931     944#
TST10   003770           1222#
TST11   004166           1271#
TST12   004644           1342    1344    1346    1362    1364    1369#
TST13   005322           1440    1442    1444    1460    1462    1467#
TST14   006000           1538    1540    1542    1558    1560    1565#
TST15   006442           1636    1638    1640    1651    1653    1658#
TST16   007120           1729    1731    1733    1749    1751    1756#
TST17   007576           1827    1829    1831    1847    1849    1854#
TST2    002724            982#
TST20   010236           1925    1941    1943    1949#
TST21   010470           2003#
TST22   011002           2072#
TST23   011362           2160#
TST24   011410           2178#
TST25   011436           2195#
TST26   011466           2212#
TST27   011514           2230#
TST3    002772            989    1007#
TST30   011542           2247#
TST31   011572           2264#
TST32   012206           2361#
TST33   016152           3072#
TST34   016250           3108#
TST35   016402           3153#
TST36   017442           3348#
TST37   020226           3476#
TST4    003042           1030#
TST40   021006           3603#
TST41   021666           3759#
TST42   022544           3926#
TST43   023256           4067#
TST5    003112           1053#
TST6    003300           1081    1094    1103#
TST7    003456           1134    1152#
TTY    =%000005            280#
TYHEAD  014554           2589    2726    2820#
TYPDS = 104404           2829    2834    2882    4460    4479    4482    4921#
TYPE  = 104400            912     913     914     915     916     918     919     920     929     930     932     933    1357
                         1455    1553    1744    1842    1936    2383    2408    2601    2727    2732    2823    2824    2826
                         2831    2836    2880    2883    3017    3018    3061    3067    3076    3077    3078    3083    3113
                         3114    3115    3116    3130    3131    3132    3199    3200    3201    3323    3324    3352    3353
                         3354    3355    3415    3416    3417    3479    3480    3482    3483    3543    3544    3610    3611
                         3612    3613    3615    3616    3698    3699    3700    3764    3765    3766    3774    3775    3854
                         3855    3928    3929    3930    3931    3932    3937    3938    3939    4049    4050    4051    4052
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                    4072    4073    4075    4076    4112    4120    4125    4129    4130    4132    4133    4134    4135
                    4155    4198    4199    4200    4205    4255    4261    4300    4301    4366    4367    4370    4392
                    4436    4456    4457    4461    4465    4477    4480    4521    4522    4550    4553    4555    4558
                    4560    4564    4571    4602    4610    4704    4804    4881    4917#   4954
TYPOC = 104401      4544    4568    4918#
TYPON = 104403      4920#
TYPOS = 104402      1359    1457    1555    1746    1844    1938    2598    2603    2729    2734    4467    4473    4919#
T10GO   004154      1255    1258#
T31END  012206      2342    2352    2356#
WAITA   023430      4113#   4114
WAITB   023444      4116#   4117
XLOOP   024600      4298    4300#
$BDADR  001122       350#
$BDDAT  001126       352#    871    2981    3025    4218    4328
$BELL   001222       385#   2383    4205    4436    4602    4620
$CHARC  026716      4715*   4722    4731*   4736#
$CMTAG  001100       338#    869     876     882     883     884    2979    2986    2992    2993    2994    3023    3030
                    3036    3037    3038    4216    4223    4229    4230    4231    4326    4333    4339    4340    4341
$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#   4536    4555    4560    4564    4610    4620    4705    4742
$DBLK   027364      4847    4881    4889#
$DOAGN  015056      2876    2886    2894    2900#
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$ENDCT  014774       882    2878#   2992    3036    4229    4339
$ENDMG  015150      2880    2921#
$ENULL  015165       920     930     933    2883    2924#
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$EOPCT  014766       882*   2875#   2879    2992*   3036*   4229*   4339*
$ERFLG  001103       341#   4597*   4620    4627    4649    4651*   4668
$ERMAX  001115       347#   4668
$ERROR  026152       876    2986    3030    4223    4333    4590#
$ERRPC  001116       348#   4542    4604*   4605*   4606    4620    6562    6564    6567    6570    6573    6576
$ERRTB  001270       426#   4550
$ERRTY  026016      4535#   4609
$ERTTL  001112       345#   4603*   4620
$FILLC  001154       364#   4708    4742
$FILLS  001153       363#   4742
$GDADR  001120       349#
$GDDAT  001124       351#
$GET42  015016      2884#
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$ICNT   001104       342#   4657*   4658    4660*   4667
$ILLUP  027564      4928    4960#
$ITEMB  001114       346#   4539    4606*   4620
$LF     001230       388#   4620    4742
$LOOP   015142      2914    2918#
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$LPERR  001110       344#
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$MXCNT  026504      4661    4667#
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                       1753#  1851#  1946#  2000#  2069#  2157#  2175#  2192#  2209#  2227#  2244#  2261#  2358#
                       3069#  3105#  3152#  3345#  3473#  3600#  3756#  3923#  4064#
$OCNT   027144         4776*  4805*  4818#
$OMODE  027146         4771*  4775*  4780   4783*  4794*  4820#
$OVER   026470         4636   4647   4659   4664#
$PASS   001100          339#  2872*  2873*  2881   2920   4655   4668
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$PWRDN  027430          880   2990   3034   4227   4337   4928#  4952
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$QUES   001226          386#  4620   4742
$RDCHR= ****** U       4922
$RDDEC= ****** U       4922
$RDLIN= ****** U       4922
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$REGAD  001156          366#
$REG0   001160          368#
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$REG2   001164          370#
$REG3   001166          371#
$REG4   001170          372#
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$REG7   001176          375#  4592*  6562   6564   6567   6570   6573   6576
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                       4238*  4341   4343*  4348*
$R2A  = ****** U       4922
$SAVRE= ****** U       4922
$SAVR6  027570         4936*  4942   4943*  4944*  4962#
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                       4221   4223   4225   4227   4229   4230   4231   4243   4331   4333   4335   4337   4339
                       4340   4341   4353   4615
$STUP = 177777          328#
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$SVPC = 000204          301#   306
$SWR  = 176000            8#    20    384    385    883    884    896    897    945    983   1008   1031   1054
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                       2161   2179   2196   2213   2231   2248   2265   2362   2863   2871   2885   2901   2920
                       2993   2994   3006   3007   3037   3038   3050   3051   3073   3109   3154   3349   3477
                       3604   3760   3927   4068   4230   4231   4243   4244   4340   4341   4353   4354   4583
                       4584   4585   4586   4587   4600   4607   4612   4618   4620   4628   4629   4630   4631
                       4635   4647   4649   4650   4651   4652   4653   4664   4667   4958
$SWRMK= 000000         4631
$TBIT   015146          895*  2911*  2920#  3005*  3049*  4242*  4352*
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$TKS    001142          358#  4113
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$TMP5   001212          381#  2409*  2528*  2584   2721   2850*
$TMP6   001214          382#  1164*  1165*  1166   1189*  1190*  1191   1234*  1235*  1236   1283*  1284*  1285
                       1308*  1309*  1310   1322*  1323*  1324   1381*  1382*  1383   1406*  1407*  1408   1420*
                       1421*  1422   1479*  1480*  1481   1504*  1505*  1506   1518*  1519*  1520   1577*  1578*
                       1579   1602*  1603*  1604   1616*  1617*  1618   1670*  1671*  1672   1695*  1696*  1697
                       1709*  1710*  1711   1768*  1769*  1770   1793*  1794*  1795   1807*  1808*  1809   1866*
                       1867*  1868   1891*  1892*  1893   1905*  1906*  1907   1961*  1962*  1963   2015*  2016*
                       2017   2040*  2041*  2042   2084*  2085*  2086   2109*  2110*  2111   2276*  2277*  2278
                       2301*  2302*  2303   2315*  2316*  2317   2449*  2450*  2451   3167*  3168*  3169   3192*
                       3193*  3194   3231*  3232*  3233   3256*  3257*  3258   3292*  3293*  3294   3317*  3318*
                       3319   3383*  3384*  3385   3408*  3409*  3410   3431*  3432*  3433   3456*  3457*  3458
                       3511*  3512*  3513   3536*  3537*  3538   3558*  3559*  3560   3583*  3584*  3585   3666*
                       3667*  3668   3691*  3692*  3693   3714*  3715*  3716   3739*  3740*  3741   3822*  3823*
                       3824   3847*  3848*  3849   3869*  3870*  3871   3894*  3895*  3896   3976*  3977*  3978
                       4001*  4002*  4003   4166*  4167*  4168   4191*  4192*  4193   4275*  4276*  4277   4292*
                       4293*  4294
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                       1659#  1753   1757#  1851   1855#  1946   1950#  2000   2004#  2069   2073#  2157   2161#
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                       2362#  3069   3073#  3105   3109#  3152   3154#  3345   3349#  3473   3477#  3600   3604#
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$TPFLG  001155          365#  4687   4742
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$TRAP   027374          878   2988   3032   4225   4335   4900#
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$TYPEX  026720         4732   4734   4737#
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$TYPON  026762         4773   4776#  4920
$TYPOS  026722         4769#  4919
$XTSTR  026336         4638#
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.     = 045444          286#   290#   301    302#   304#   306#   308#   314#   317#   321#   325#   337#   389
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                       3465   3545   3592   3701   3748   3856   3903   4011   4201   4219   4243   4329   4353
                       4574#  4620   4667   4668   4742   4889#  4939   4961   5859#
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ENDCOM      6#  273#  2395  6611  6613  6615
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          1043  1047  1076  1080  1090  1093  1097  1113  1133  1142  1146  1206  1210  1214  1256
          1345  1349  1365  1443  1447  1463  1541  1545  1561  1639  1643  1654  1732  1736  1752
          1830  1834  1850  1924  1928  1944  1994  2064  2124  2128  2132  2136  2140  2144  2149
          2154  2171  2188  2205  2223  2240  2257  2340  2345  2354  2372  2489  2501  2509  2615
          2622  2627  2633  2637  2641  2645  2649  2652  2661  2667  2745  2752  2755  2761  2767
          2772  2776  2780  2784  2787  2935  2939  2943  2951  3090  3094  3098  3102  3120  3124
          3128  3137  3141  3145  3149  3206  3211  3215  3219  3268  3272  3276  3280  3330  3334
          3338  3342  3359  3363  3367  3371  3470  3487  3491  3495  3499  3597  3620  3626  3635
          3639  3643  3650  3654  3753  3782  3791  3795  3799  3806  3810  3908  3946  3951  3956
          3960  4018  4022  4026  4034  4038  4042  4047  4061  4083  4092  4096  4100  4107  4111
          4143  4153  4447  4513
ESCAPE    273#
GETPRI      5#  1059  1116  1156  1171  1181  1226  1241  1275  1290  1300  1314  1373  1388  1398
          1412  1471  1486  1496  1510  1569  1584  1594  1608  1662  1677  1687  1701  1760  1775
          1785  1799  1858  1873  1883  1897  1953  1968  2007  2022  2032  2076  2091  2101  2268
          2283  2293  2307  2441  2456  3159  3174  3184  3223  3238  3248  3284  3299  3309  3375
          3390  3400  3423  3438  3448  3503  3518  3528  3550  3565  3575  3658  3673  3683  3706
          3721  3731  3814  3829  3839  3861  3876  3886  3968  3983  3993  4158  4173  4183  4267
          4284
INT       1268#  1366  1464  1562  1655  1753  1851
MEOP      2856#  2868
MULT       273#
NEWTST      6#  273#  941   979   1004  1027  1050  1100  1149  1219  1268  1366  1464  1562  1655
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          3152  3345  3473  3600  3756  3923  4064
POP        273#  4876  4946
PRIORA     160#  1058  1115
PRIORB     161#  1155  1225  1274  1372  1470  1568  1661  1759  1857  1952  2006  2075  2267  3158
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PRIORC     162#  1170  1240  1289  1387  1485  1583  1676  1774  1872  1967  2021  2090  2282  2455
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PRIORD     163#  1180  1299  1397  1495  1593  1686  1784  1882  2031  2100  2292  2440  3183  3247
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PRIORE     164#  1200  1333  1431  1529  1627  1720  1818  1916  1987  2057  2329
PRIORF     165#
PRIORH     166#  4266
PRIORI     167#  4282
PUSH       273#  4835  4930
SAVE      4526#  4591
SCOPE      174#  944   982   1007  1030  1053  1103  1152  1222  1271  1369  1467  1565  1658  1756
          1854  1949  2003  2072  2160  2178  2195  2212  2230  2247  2264  2361  2380  3072  3108
          3153  3348  3476  3603  3759  3926  4067  4204
SETPRI       4#  924   936   1068  1084  1125  1135  1166  1191  1201  1236  1285  1310  1324  1334
          1383  1408  1422  1432  1481  1506  1520  1530  1579  1604  1618  1628  1672  1697  1711
          1721  1770  1795  1809  1819  1868  1893  1907  1917  1963  1977  1988  2017  2042  2052
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          3871  3896  3978  4003  4168  4193  4277  4294  6593
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SETUP      273#  868   2978  3022  4215  4325
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SLASH     273#
SPACE     273#
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           1564   1655    1657    1753    1755    1851    1853    1946    1948    2000    2002    2069    2071    2157    2159
           2175   2177    2192    2194    2209    2211    2227    2229    2244    2246    2261    2263    2358    2360    2857
           3069   3071    3105    3107    3152    3345    3347    3473    3475    3600    3602    3756    3758    3923    3925
           4064   4066    4527    4576    4621    4669    4743    4822    4891    4923    6581    6583    6599    6601    6603
           6612   6614    6616
SWRSU      897#   3007#   3051#   4244#   4354#
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TYPTXT    273#
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.SCATC      4#    283
.SCMTA      4#    330
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ASL     4547  4548  4549  4904
ASLB    4860
BCC     4387  4861
BEQ      948   952   956   964   973   987   994  1000  1010  1014  1019  1023  1033  1037  1042
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BGE     2626  2853  4659  4734
BGT     2573  2579  2710  2716  2803  2876  4446  4806  4869
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BITB    4722
BLE     2559  2704
BLT     2765  4713  4807  4852  4868
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BNE      872   911   923   935  1083  1132  1986  2131  2135  2139  2423  2431  2475  2482  2495
        2518  2521  2530  2538  2544  2553  2556  2567  2570  2582  2588  2621  2651  2670  2679
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        3017  3027  3028  3030  3032  3034  3036  3037  3038  3050  3051  3061  3070  3071  3072
        3073  3106  3107  3108  3109  3153  3154  3346  3347  3348  3349  3474  3475  3476  3477
        3601  3602  3603  3604  3757  3758  3759  3760  3924  3925  3926  3927  4065  4066  4067
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        4609  4610  4611  4612  4618  4619  4620  4622  4628  4631  4635  4637  4648  4649  4651
        4653  4657  4662  4663  4664  4667  4668  4670  4693  4744  4823  4892  4901  4904  4917
        4918  4919  4920  4921  4922  4924  4936  4946  4956  4958  4959  4963  6582  6584  6600
        6601  6602  6603  6604  6605  6611  6613  6615  6617
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         249   250   251   252   253   254   255   256   257   258
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.MCALL       4       5       6     273     897    3007    3051    4244    4354
.NLIST       1     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     941     945     979     983
          1004    1008    1027    1031    1050    1054    1100    1104    1149    1153    1219    1223    1268    1272    1366
          1370    1464    1468    1562    1566    1655    1659    1753    1757    1851    1855    1946    1950    2000    2004
          2069    2073    2157    2161    2175    2179    2192    2196    2209    2213    2227    2231    2244    2248    2261
          2265    2358    2362    2388    2398    2402    2870    2976    3007    3051    3069    3073    3105    3109    3152
          3154    3345    3349    3473    3477    3600    3604    3756    3760    3923    3927    4064    4068    4208    4244
          4309    4354    4502    4615    4631    4908    4917    4918    4919    4920    4921    4922    4975    6600    6602
          6604    6612    6614    6616
.PAGE       42     330     389
.REPT      290     368     376    2389    2395
.SBTTL      43     138     169     284     294     299     332     412     865     941     979    1004    1027    1050    1100
          1149    1219    1268    1366    1464    1562    1655    1753    1851    1946    2000    2069    2157    2175    2192
          2209    2227    2244    2261    2358    2402    2859    2976    3069    3105    3345    3473    3600    3756    3923
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           376     377     378     379     380     381     382     383    2875    2878    4554    4559    4736    4820    4955
          4957    4967
```

ERRORS DETECTED: 0

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 *DZCDB,DZCDB/CRF/SOL=DZCDB.P11
 RUN-TIME: 27 25 4 SECONDS
 CORE USED:  20K

EOF1DZCDBBSEQ          00010000      770920          PDP10 411
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