KW11-L

LINE TIME CLOCK

MD-11-DZKWA-D

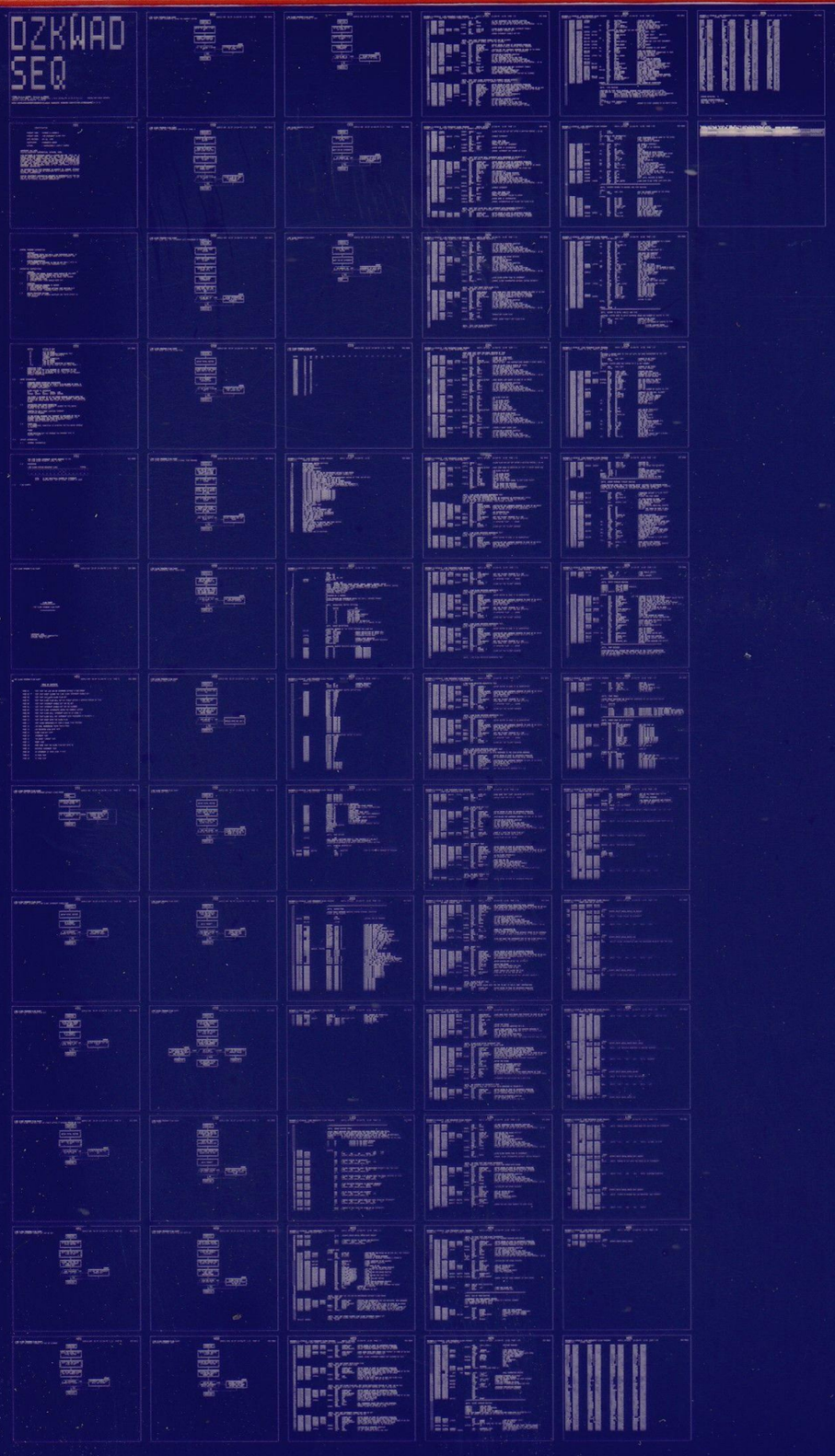
EP-DZKWA-D-DL-B

SEP 1975

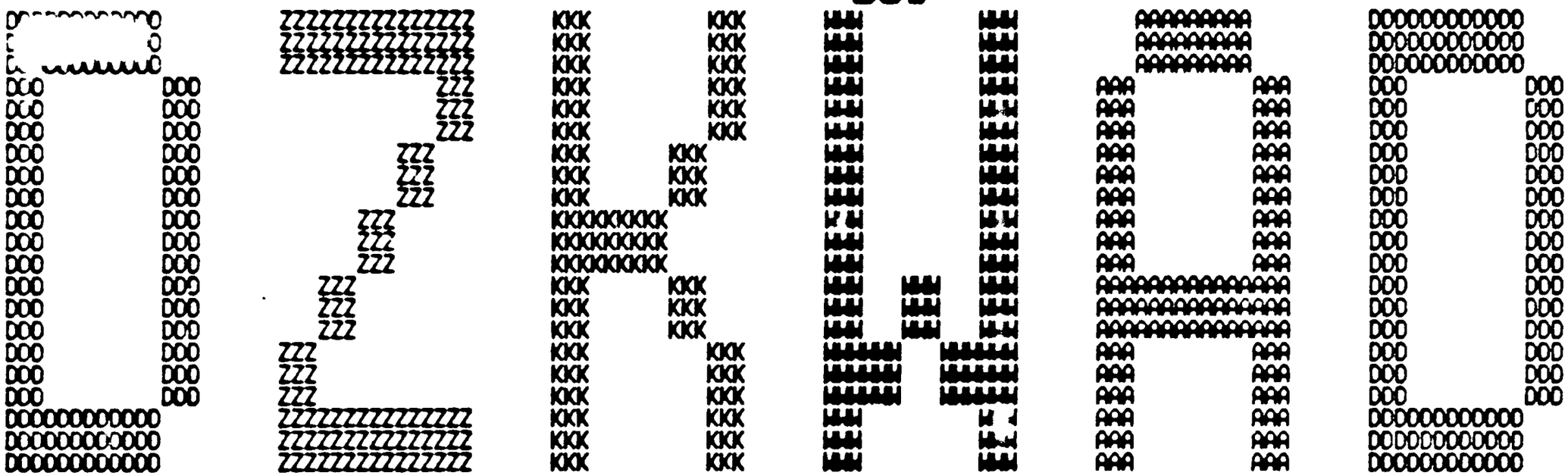
FICHE 1 OF 1

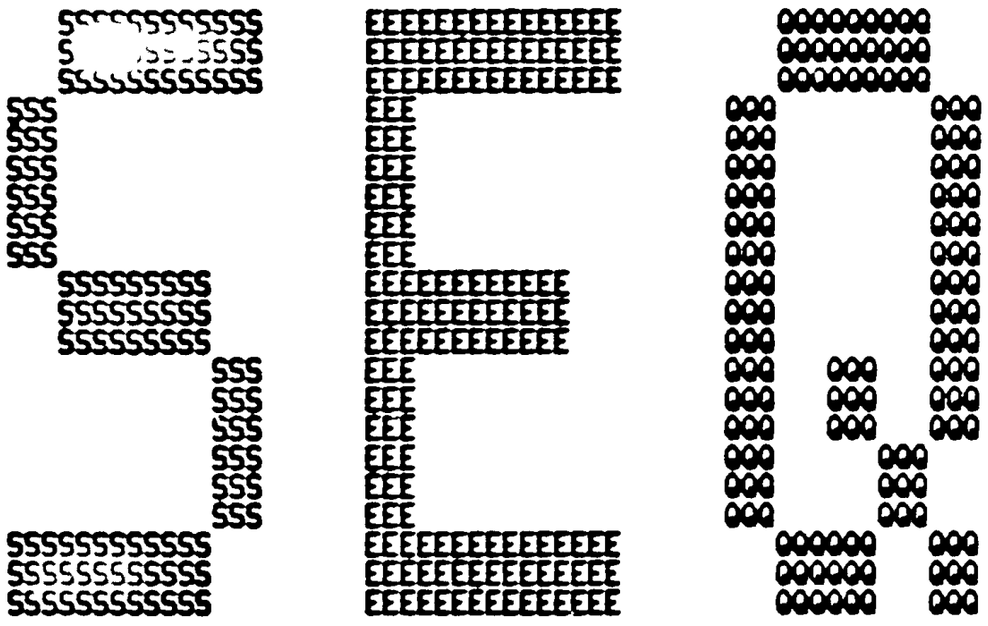
digital

Made In U.S.A.



B01





LPTSPL Version 6(434) Running on MTB401
 START User BABE [1,2] Job DZKHAD Seq. 1 Date 26-Sep-75 14:19:14 Monitor   RS212b SYS #40/2 *START*
Request created: 26-Sep-75 14:19:12

[illegible] 14:19:15

IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZKWA-D

PRODUCT NAME: LINE FREQUENCY CLOCK TEST

DATE REVISED: MAY 20, 1975

MAINTAINER: DIAGNOSTIC GROUP

AUTHOR: J RODENHISER/J LACEY/J COMEAU

1.0 GENERAL PROGRAM INFORMATION

1.1 ABSTRACT
THIS PROGRAM TESTS THE KW11L LINE FREQUENCY CLOCK. IT VALIDATES PROPER OPERATION UNDER BOTH INTERRUPT AND NON-INTERRUPT MODES.

1.2 SYSTEM REQUIREMENTS
THIS PROGRAM IS DESIGNED TO RUN ON ANY PDP-11 WITH 4K OF MEMORY AND A KW11 LINE FREQUENCY CLOCK.

2.0 OPPERATING INSTRUCTIONS

2.1 LOADING
PROCEDURE FOR NORMAL BINARY TAPES SHOULD BE FOLLOWED
A ABSOLUTE LOADER PROGRAM MUST BE IN MEMORY
B PLACE THE BINARY TAPE IN THE PAPER TAPE READER
C LOAD ADDRESS 17500
D DEPRESS START (TAPE SHOULD READ IN)

2.2 STARTING
PROGRAM STARTING ADDRESS IS 000200
A LOAD ADDRESS 000200
B SELECT SWITCH REGISTER OPTIONS (SEE SECTION 2.3)
C DEPRESS START (PROGRAM SHOULD START RUNNING)

2.3 SWITCH REGISTER OPTIONS
HERE IS A LIST OF CONSOLE SWITCHES AND THEIR EFFECT ON THE PROGRAM...

SWITCH	ACTION IF SET
15	HALT ON ERROR
14	LOOP ON CURRENTLY EXECUTING TEST
13	INHIBIT ERROR PRINTOUTS
12	(UNUSED)
11	INHIBIT ITERATIONS
10	BELL ON ERROR
9	LOOP ON ERROR
8	LOOP ON TEST SPECIFIED IN SWR<7:0>
7-0	# OF TEST TO LOOP ON (ONLY WHEN SWR8 = 1)

2.4 EXECUTION TIMES

EXECUTION TIME FOR THIS PROGRAM IS DEPENDENT ON THE MODEL OF PDP-11 IT IS BEING RUN ON. FOR A PDP-11/40 ABOUT 5 SECONDS IS NECESSARY TO DO 1 PASS OF THE PROGRAM WITHOUT ITERATIONS.

3.0 ERROR INFORMATION

3.1 STANDARD ERROR REPORTING PROCEDURES

ERROR PRINTOUTS CONSIST OF FROM 4 TO 8 COLUMNS OF DATA, A DATA HEADER, AND POSSIBLY A SHORT ERROR MESSAGE DESCRIBING THE ERROR. FOR EXAMPLE...

```
CLOCK FAILED TO INTERRUPT
PC      PS      SP      TEST#   LKS
002262  000344  000764  000007  000300
```

THE FIRST 4 COLUMNS OF OF THE ERROR MESSAGE ALWAYS SHOW THE CONTENTS OF THE PC, PS, SP, AND THE TEST NUMBER. MORE COLUMNS OF DATA ARE ADDED WHERE THEY MIGHT BE RELAVENT TO A PARTICULAR ERROR.

3.2 UNEXPECTED TRAP ERROR REPORTING

AN UNEXPECTED TRAP TO ADDRESS 4 CAUSES THE FOLLOWING MESSAGE TO BE PRINTED OUT...

```
TRAPPED TO LOC 4 FROM LOCATION "XXXXXX"
RESTARTING PROGRAM
```

IN THE ACTUAL MESSAGE THE "XXXXXX" IS REPLACED BY THE PC ADDRESS PUSHED ONTO THE STACK WHEN THE UNEXPECTED TRAP OCCURS. THE PROGRAM THEN TRYS TO RESTART ITSELF DESPITE SWITCH REGISTER SETTINGS.

3.3 POWER FAIL

IF A POWER FAIL CONDITION IS DETECTED THE FOLLOWING MESSAGE IS PRINTED...

```
POWER
```

AFTER PRINTING OUT THE MESSAGE THE PROGRAM TRYS TO RESTART ITSELF.

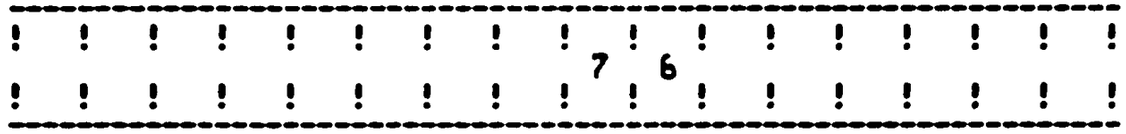
5.0 DEVICE INFORMATION

5.1 GENERAL INFORMATION

THE LINE CLOCK INTERRUPT VECTOR ADDRESS IS 100
THE LINE CLOCK PRIORITY LEVEL IS BR6

5.2 REGISTERS

LINE CLOCK STATUS REGISTER (LKS) 777546



BIT6 IF SET MONITOR=1 CAUSES AN INTERRUPT
BIT7 MONITOR BIT. SET BY CLOCK, CLEARED BY USER

7.0 FLOW CHARTS

FLOW CHART
****

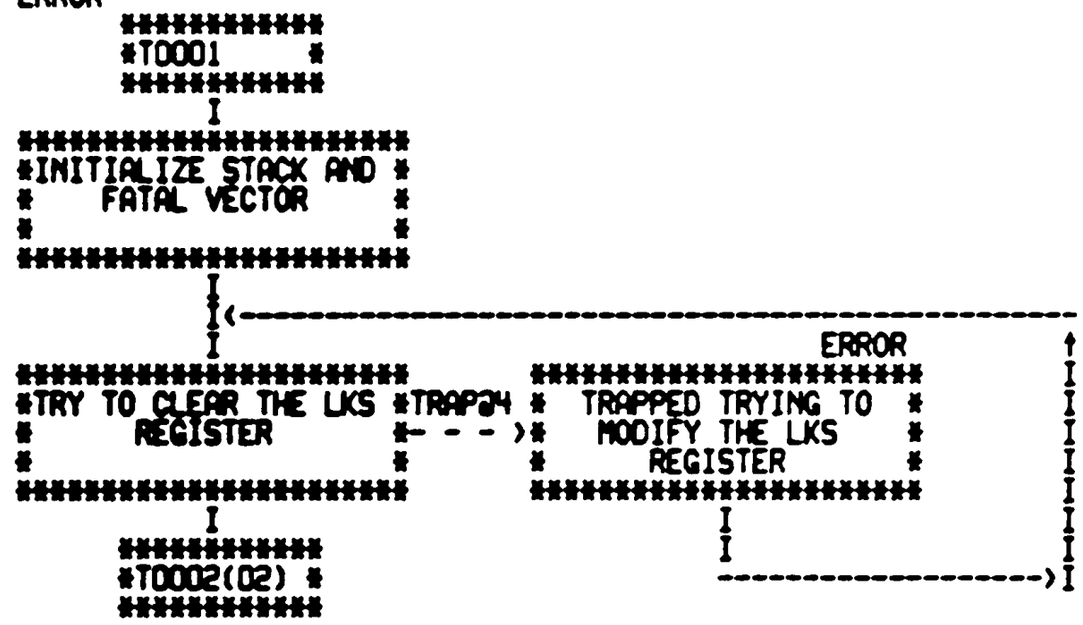
LINE CLOCK PROGRAM FLOW CHART

****

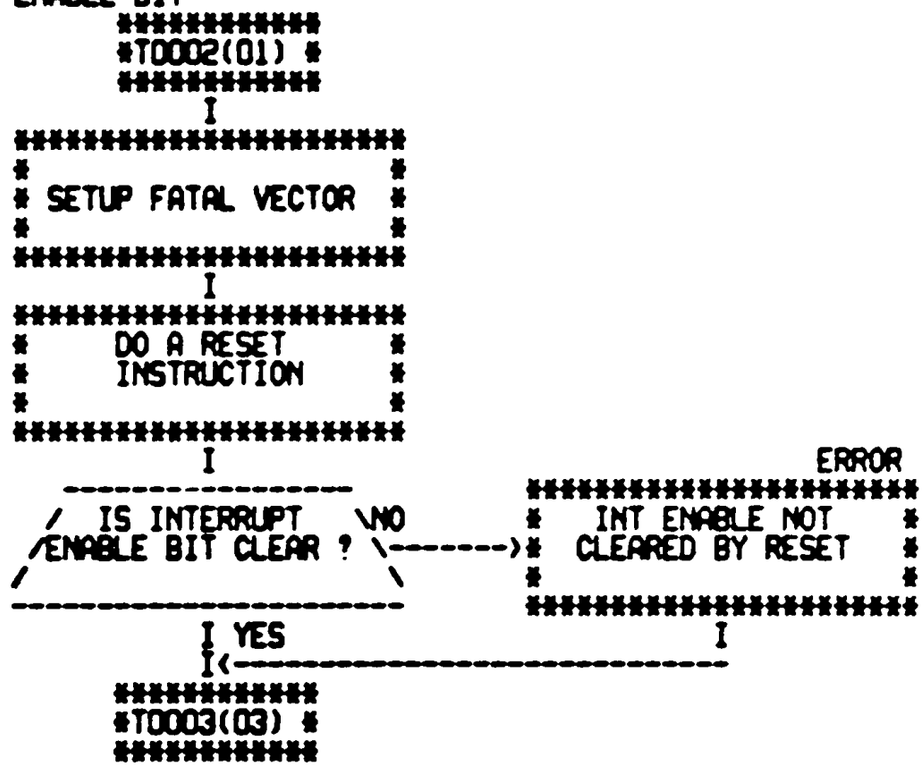
TABLE OF CONTENTS
****

I01

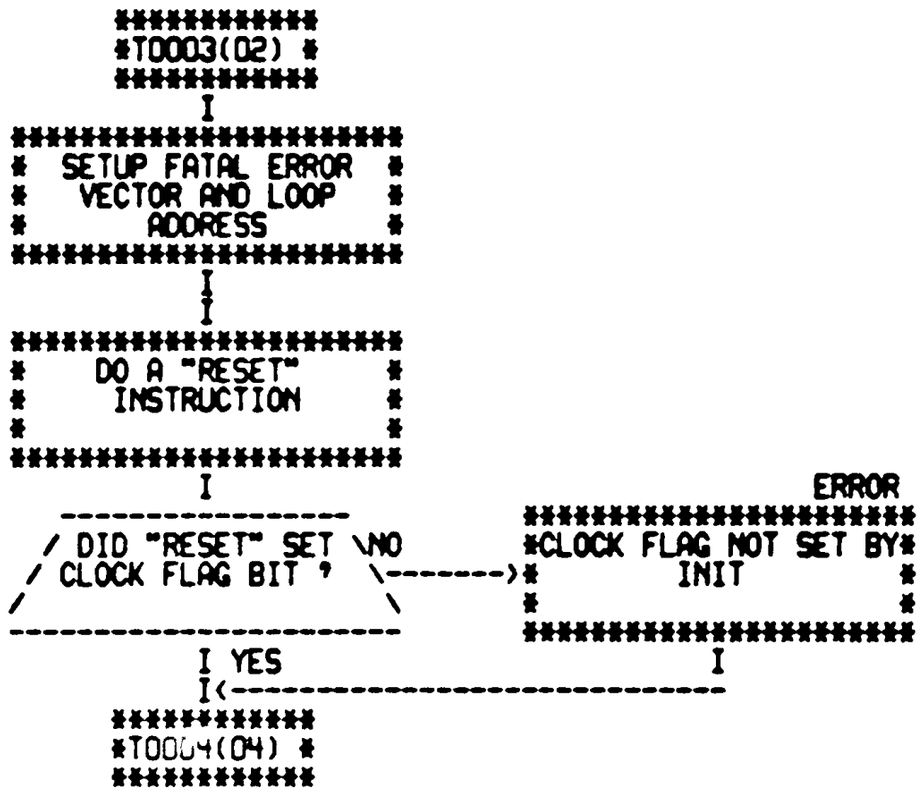
LINE CLOCK PROGRAM FLOW CHART
TEST THAT THE LKS CAN BE ACCESSED WITHOUT A BUS ERROR



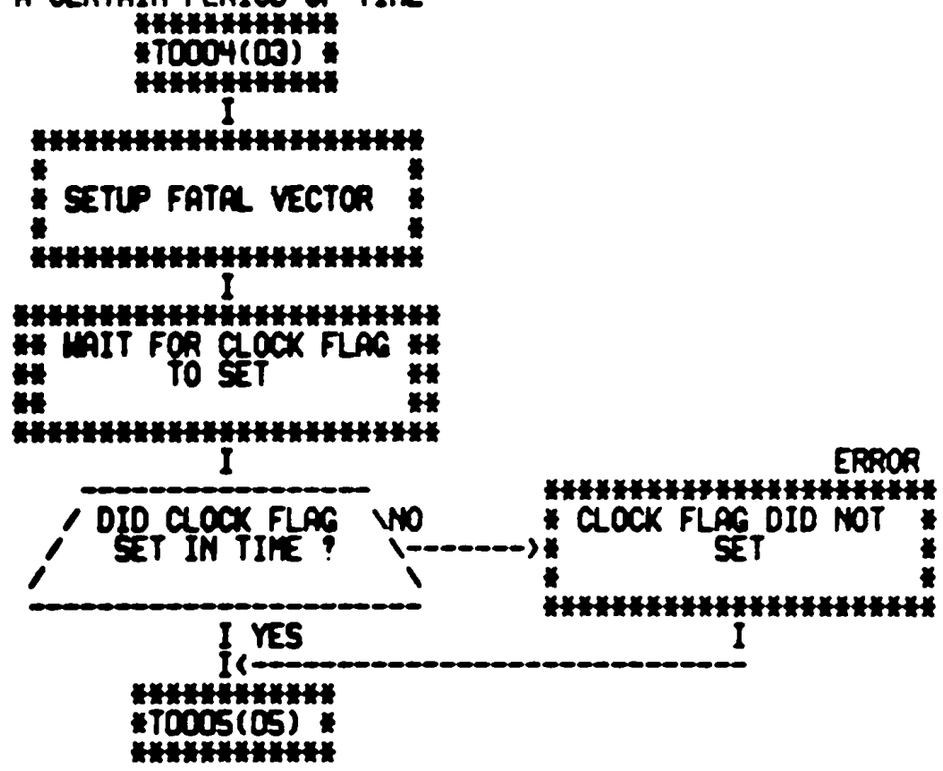
J01

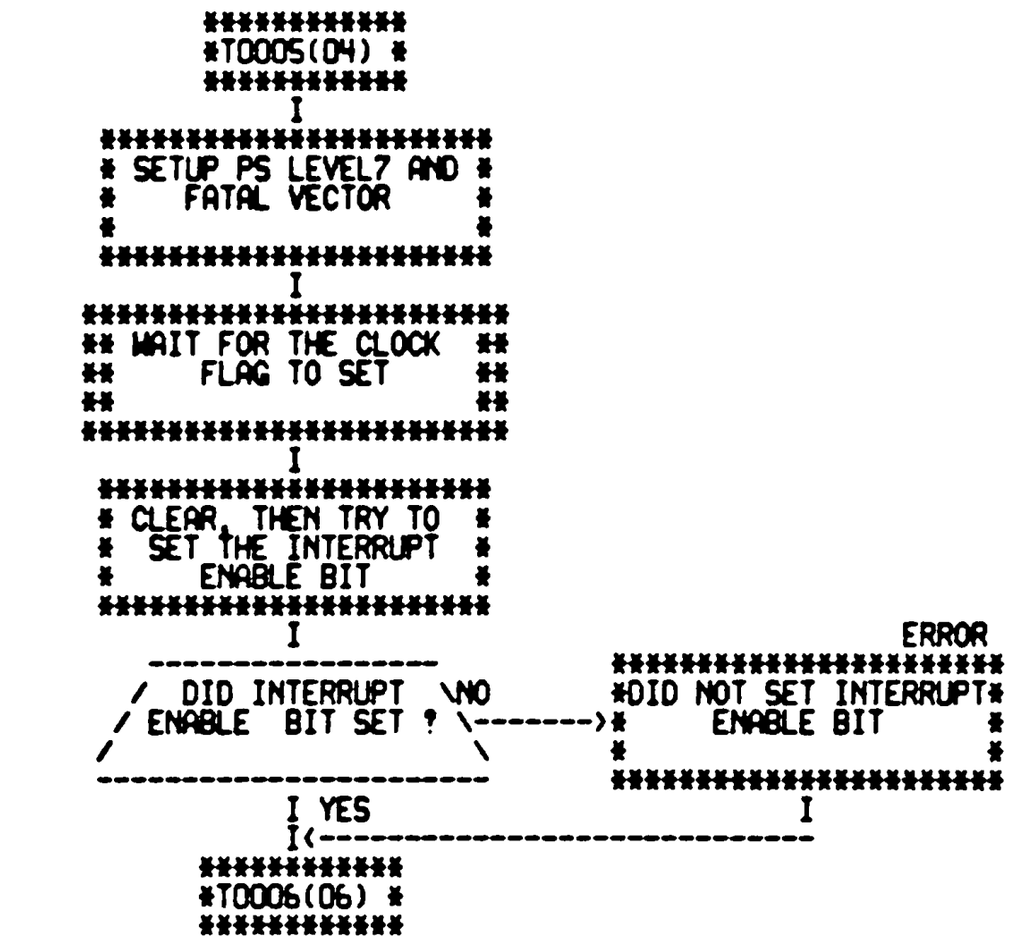

T0002(01)
SETUP FATAL VECTOR
DO A RESET INSTRUCTION
IS INTERRUPT ENABLE BIT CLEAR ?
NO
ERROR
INT ENABLE NOT CLEARED BY RESET
YES
T0003(03)

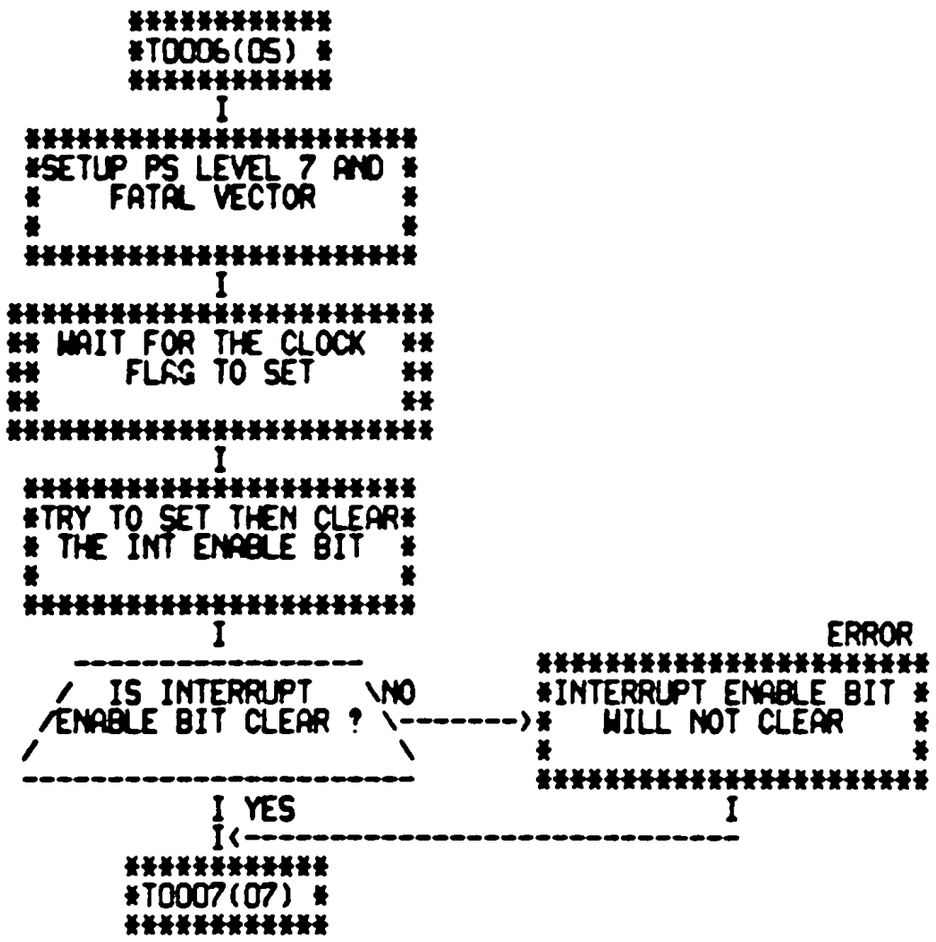
LINE CLOCK PROGRAM FLOW CHART
TEST THAT INIT SETS CLOCK FLAG BIT

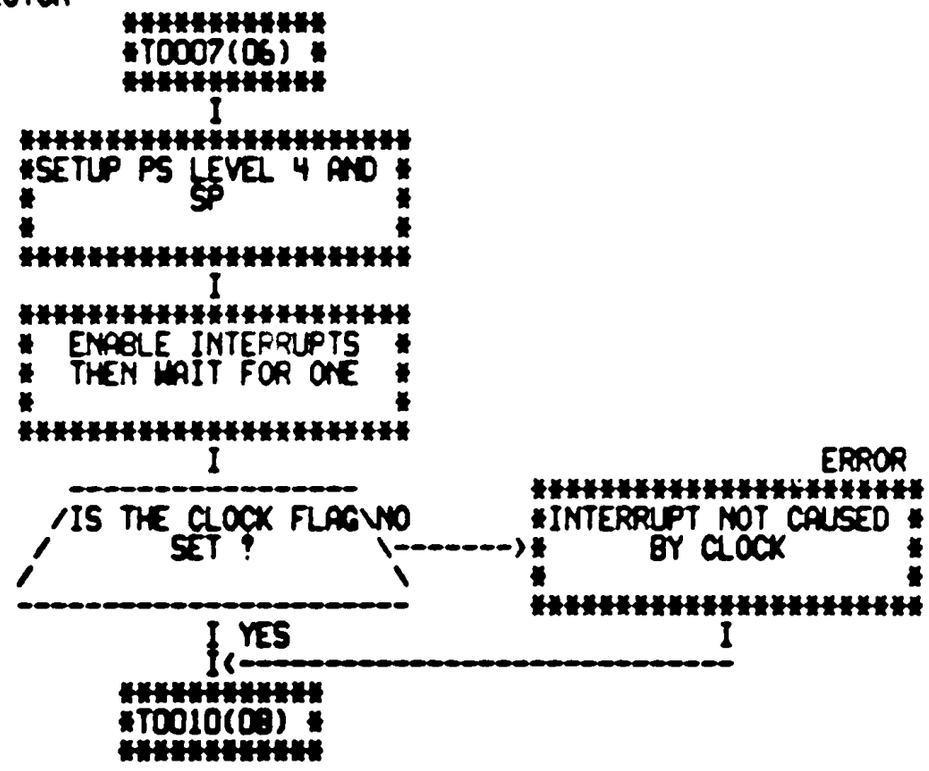


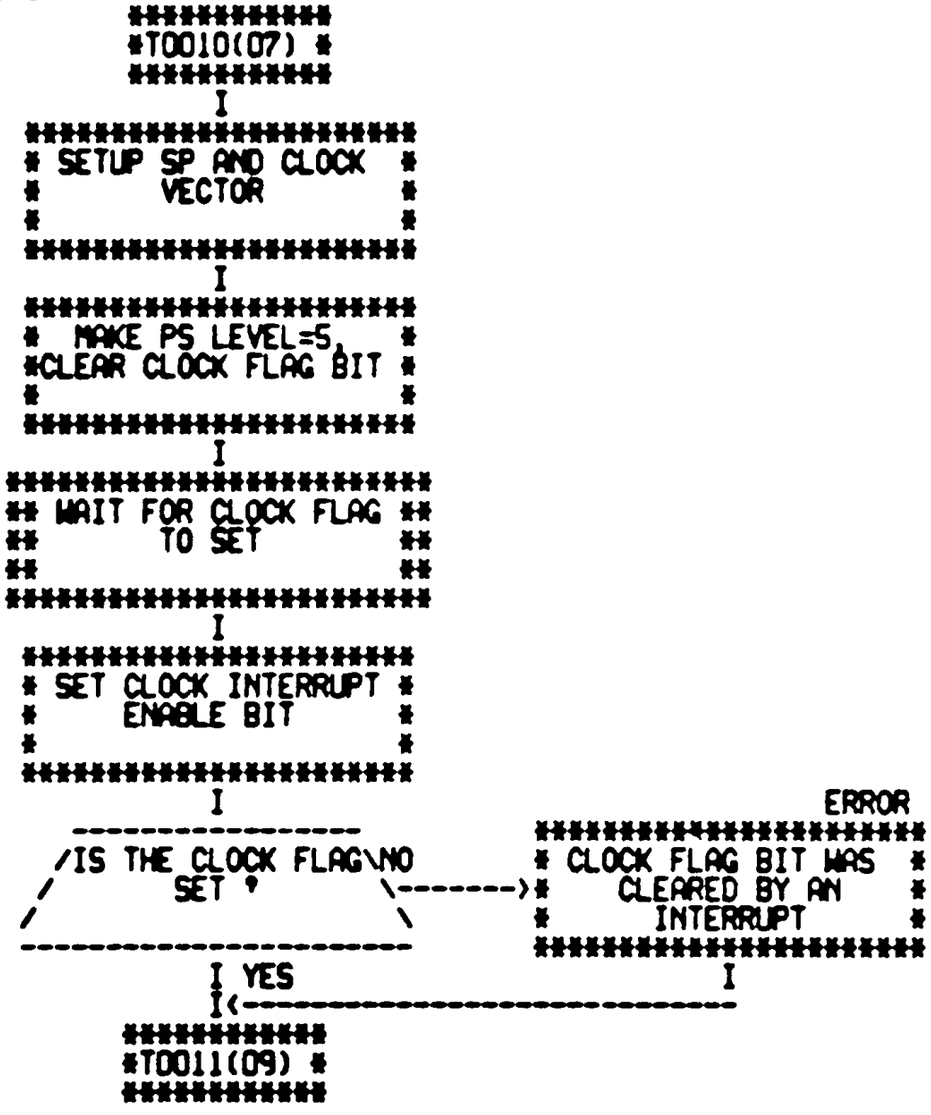
TEST THAT CLOCK FLAG WILL SET BY ITSELF WITHIN A CERTAIN PERIOD OF TIME



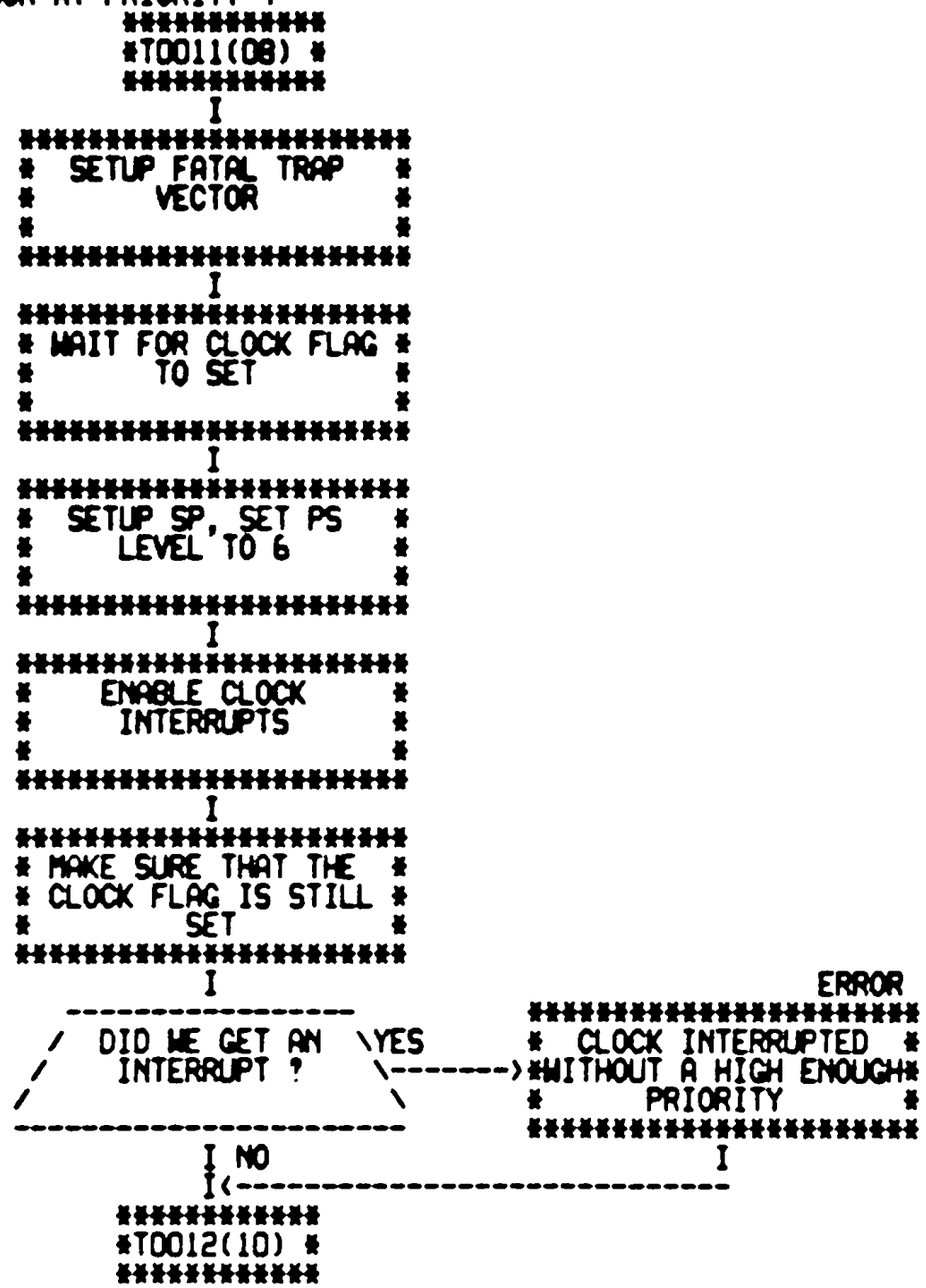

*TOOO5(04) *
* SETUP PS LEVEL7 AND *
* FATAL VECTOR *
* *
** WAIT FOR THE CLOCK **
** FLAG TO SET **
** **
* CLEAR, THEN TRY TO *
* SET THE INTERRUPT *
* ENABLE BIT *
/ DID INTERRUPT \NO
/ ENABLE BIT SET ? \
\ /
YES
ERROR
DID NOT SET INTERRUPT
* ENABLE BIT *
*T0006(06) *

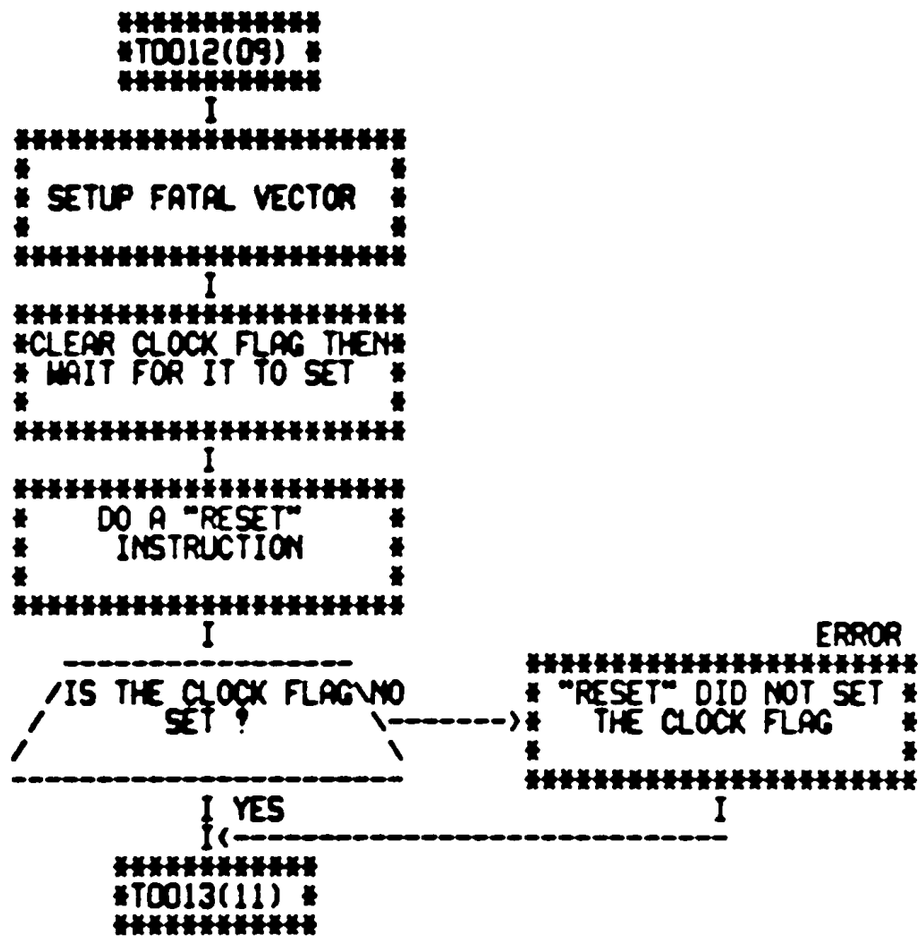

T0006(05)
SETUP PS LEVEL 7 AND FATAL VECTOR
WAIT FOR THE CLOCK FLAG TO SET
TRY TO SET THEN CLEAR THE INT ENABLE BIT
IS INTERRUPT ENABLE BIT CLEAR ?
NO
ERROR
INTERRUPT ENABLE BIT WILL NOT CLEAR
YES
T0007(07)

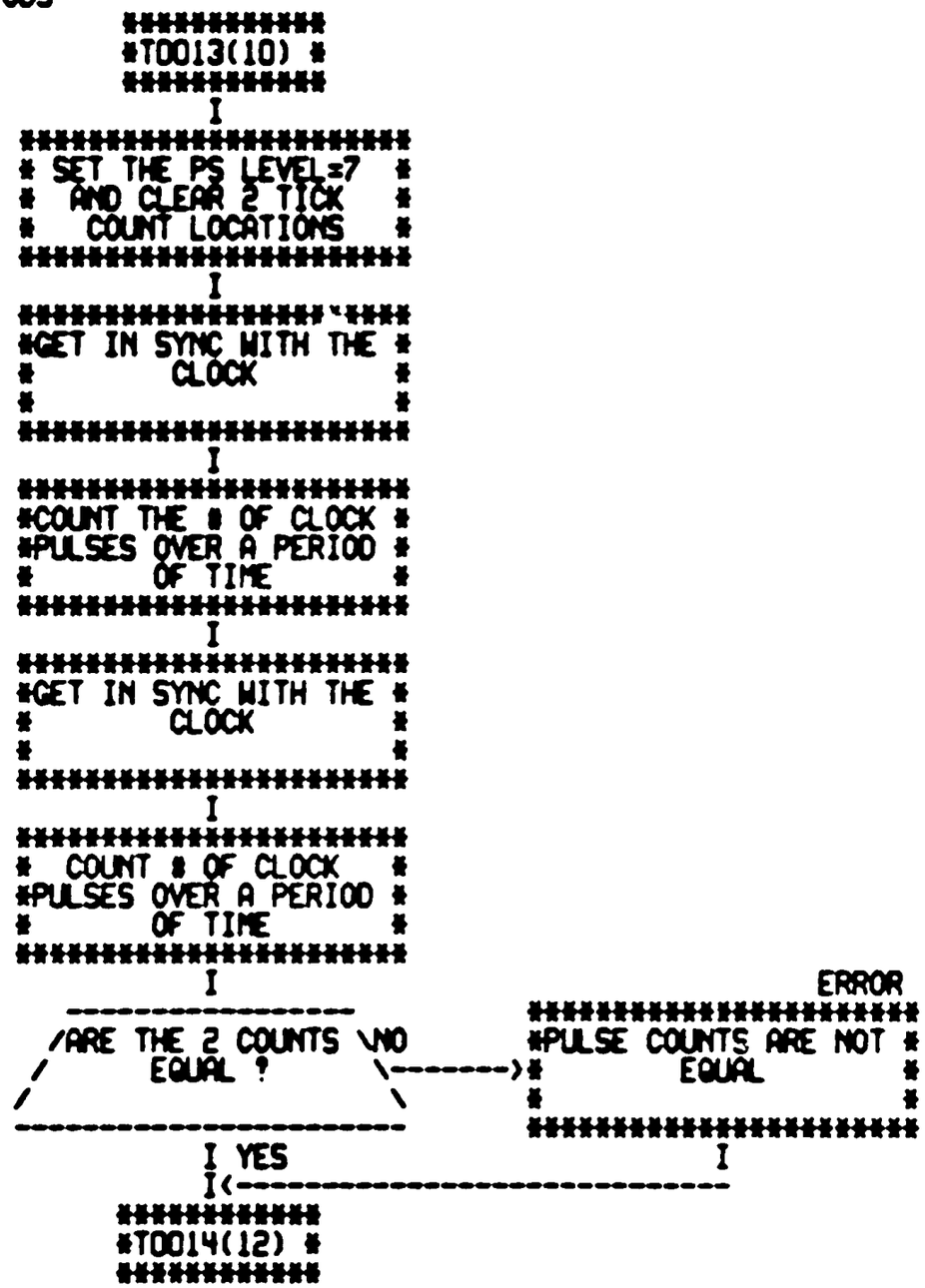

*T0007(06) *
SETUP PS LEVEL 4 AND SP
ENABLE INTERRUPTS THEN WAIT FOR ONE
IS THE CLOCK FLAG SET ?
NO
ERROR
INTERRUPT NOT CAUSED BY CLOCK
YES
*T0010(08) *


#TOO10(07) #
SETUP SP AND CLOCK VECTOR
MAKE PS LEVEL=5,
#CLEAR CLOCK FLAG BIT #
WAIT FOR CLOCK FLAG TO SET
SET CLOCK INTERRUPT ENABLE BIT
IS THE CLOCK FLAG SET ?
NO
YES
ERROR
CLOCK FLAG BIT WAS CLEARED BY AN INTERRUPT
#TOO11(09) #

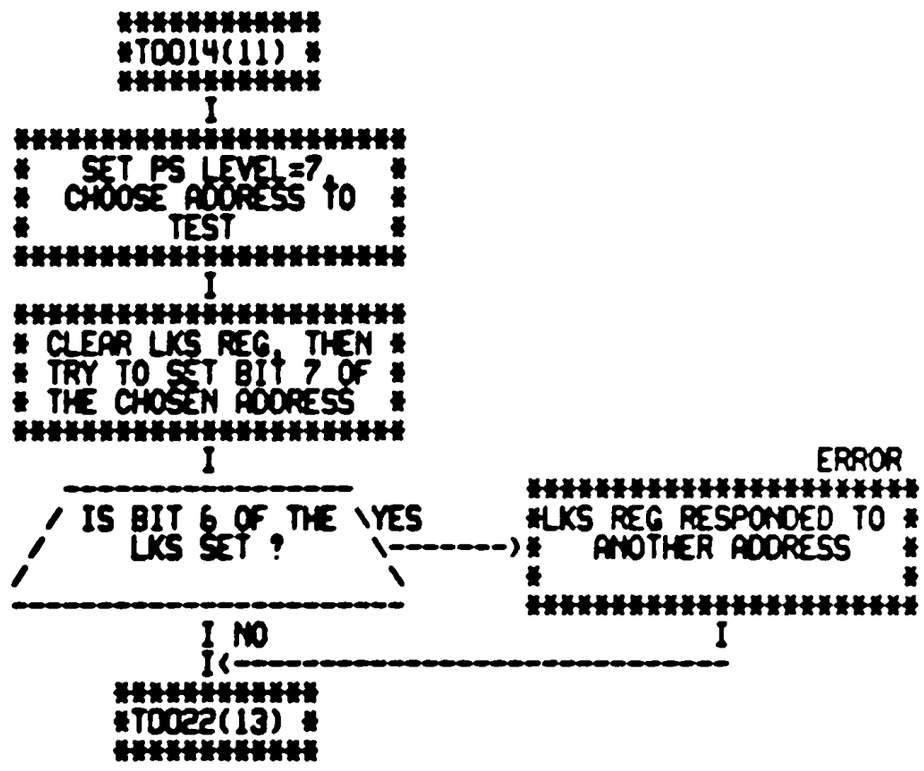
TEST THAT CLOCK WILL NOT INTERRUPT WITH PROCESSOR AT PRIORITY 4

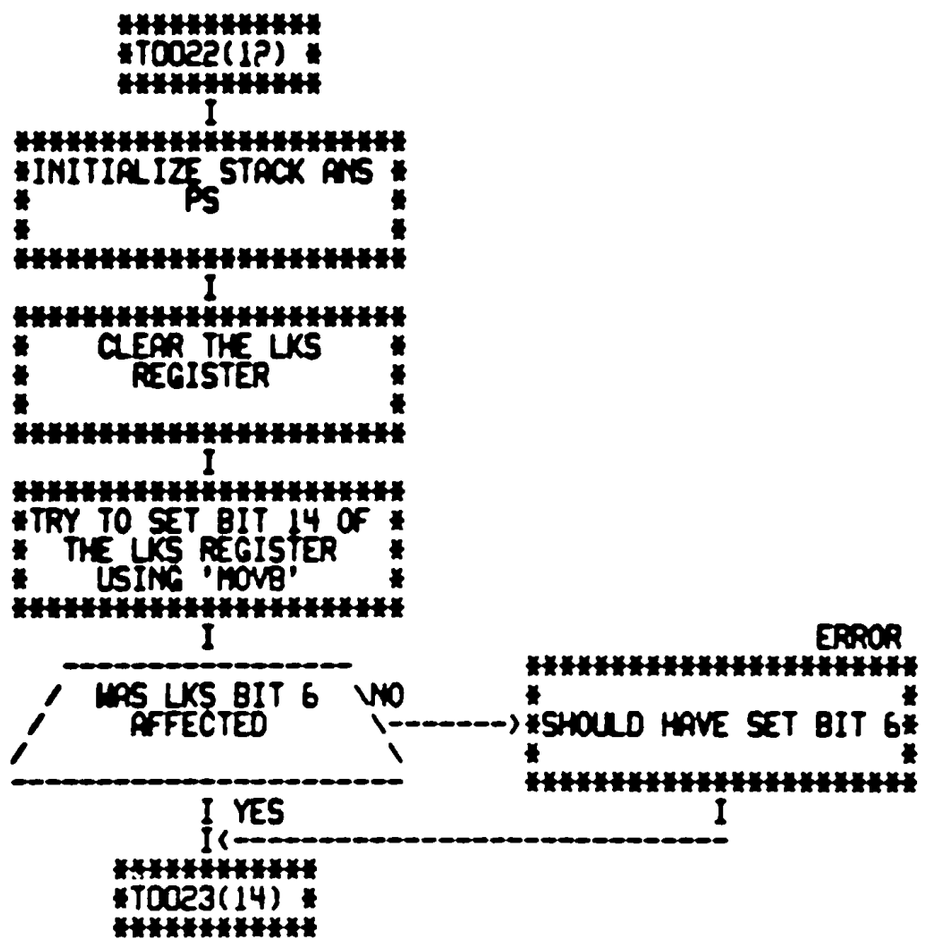


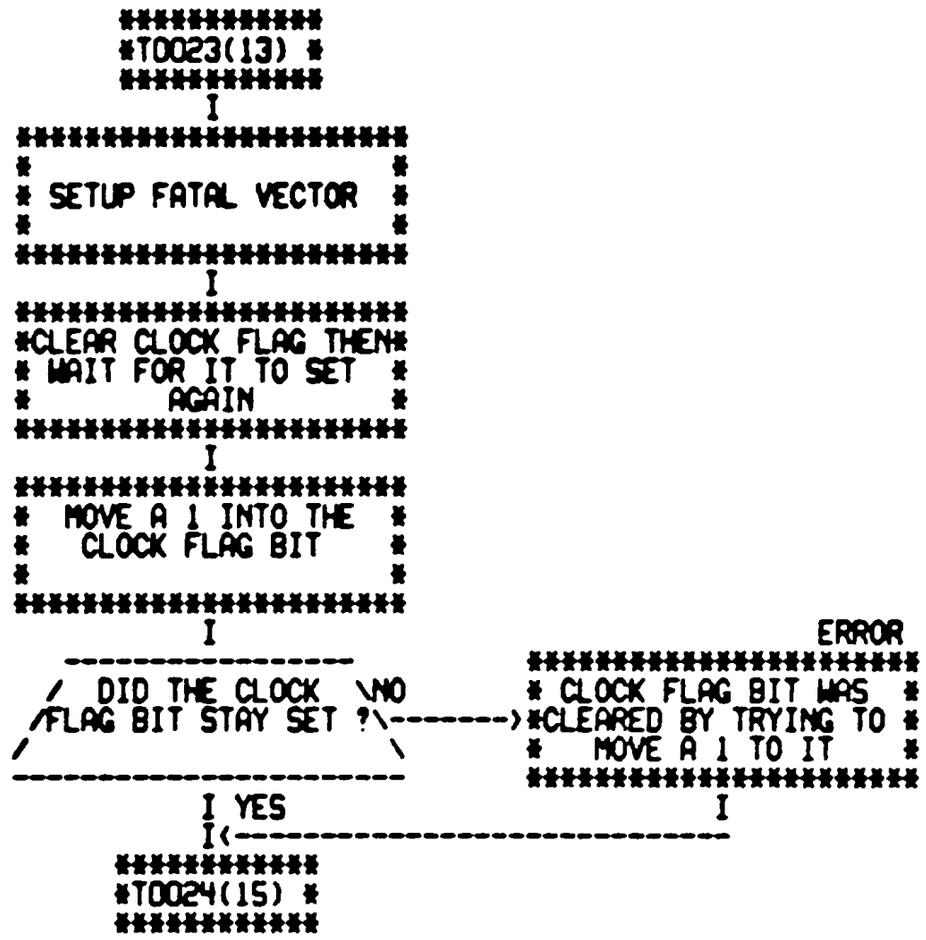

TO012(09)
SETUP FATAL VECTOR
CLEAR CLOCK FLAG THEN
WAIT FOR IT TO SET
DO A "RESET"
INSTRUCTION
IS THE CLOCK FLAG
SET ?
NO
ERROR
"RESET" DID NOT SET
THE CLOCK FLAG
YES
TO013(11)

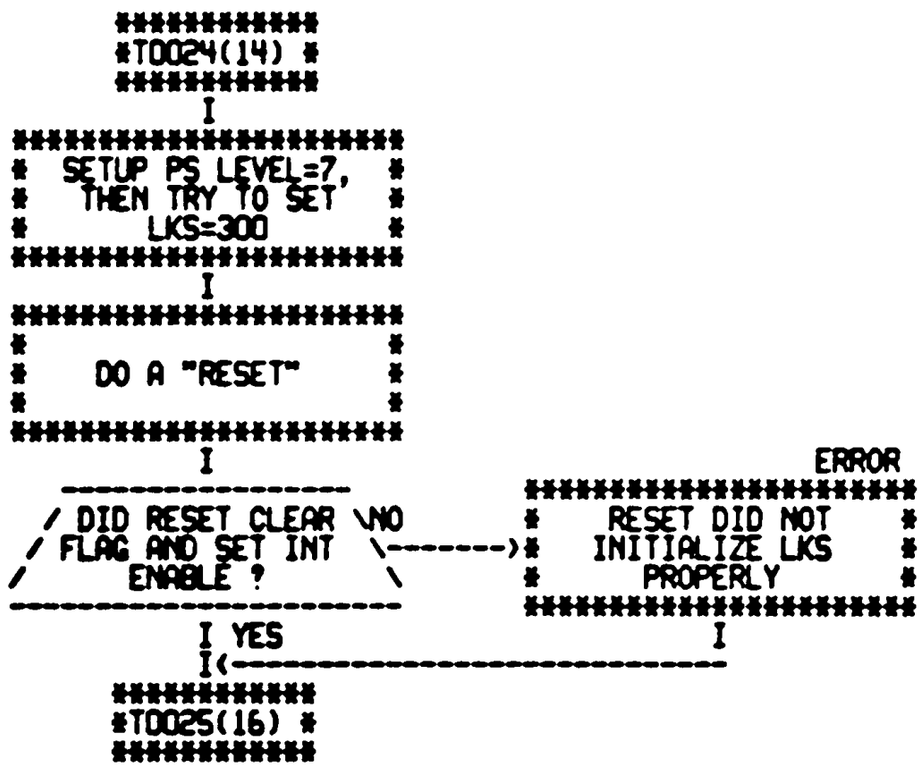

T0013(10)
SET THE PS LEVEL=7 AND CLEAR 2 TICK COUNT LOCATIONS
GET IN SYNC WITH THE CLOCK
COUNT THE # OF CLOCK PULSES OVER A PERIOD OF TIME
GET IN SYNC WITH THE CLOCK
COUNT # OF CLOCK PULSES OVER A PERIOD OF TIME
ARE THE 2 COUNTS EQUAL ?
NO
ERROR
PULSE COUNTS ARE NOT EQUAL
YES
T0014(12)

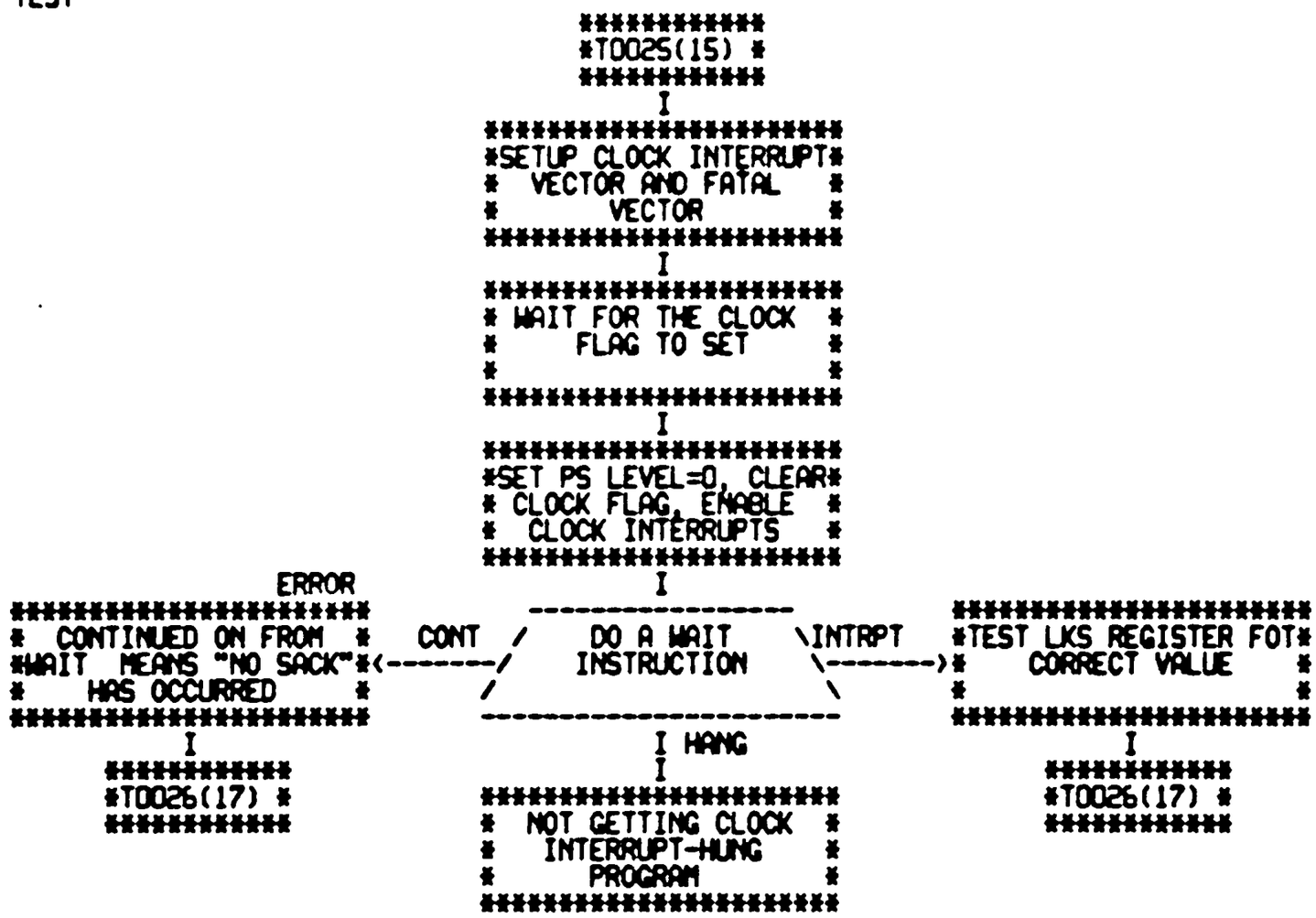
G02

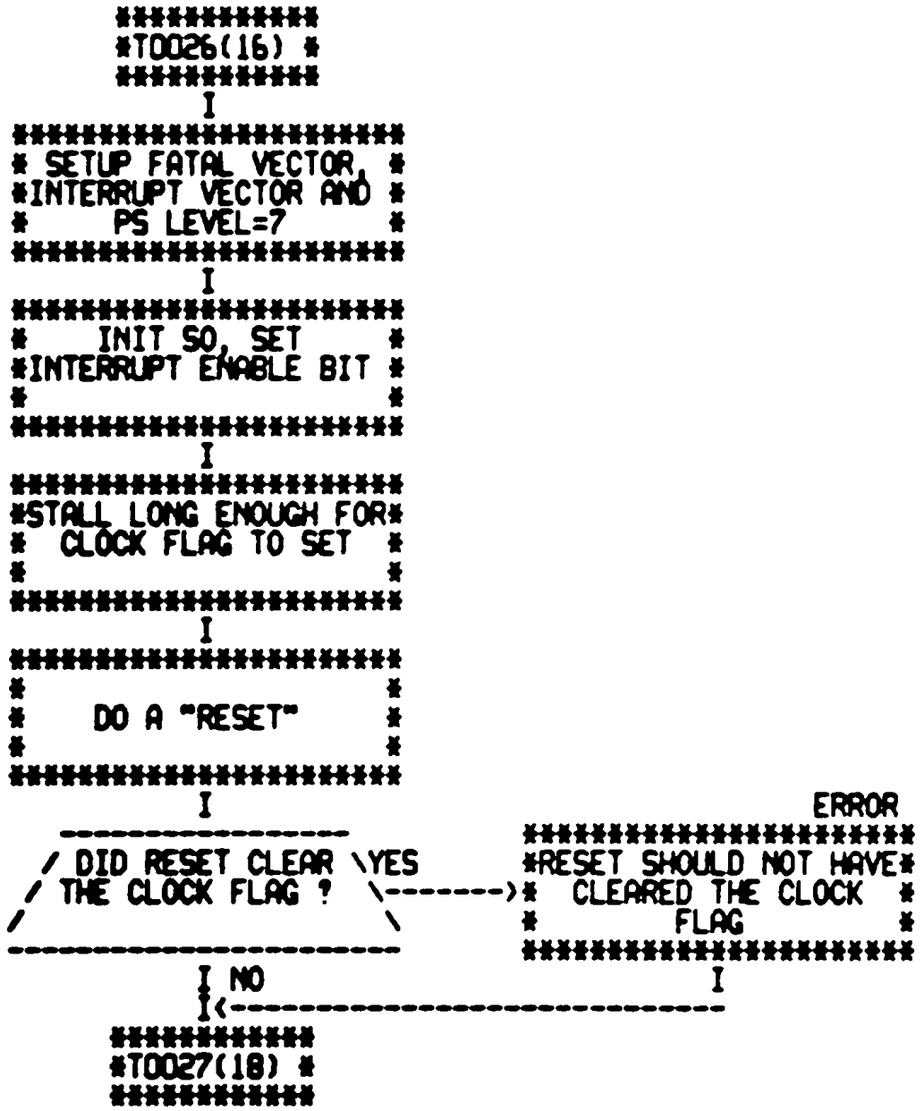

T0014(11)
SET PS LEVEL=7, CHOOSE ADDRESS TO TEST
CLEAR LKS REG, THEN TRY TO SET BIT 7 OF THE CHOSEN ADDRESS
IS BIT 7 OF THE LKS SET ?
YES
ERROR
LKS REG RESPONDED TO ANOTHER ADDRESS
NO
T0022(13)

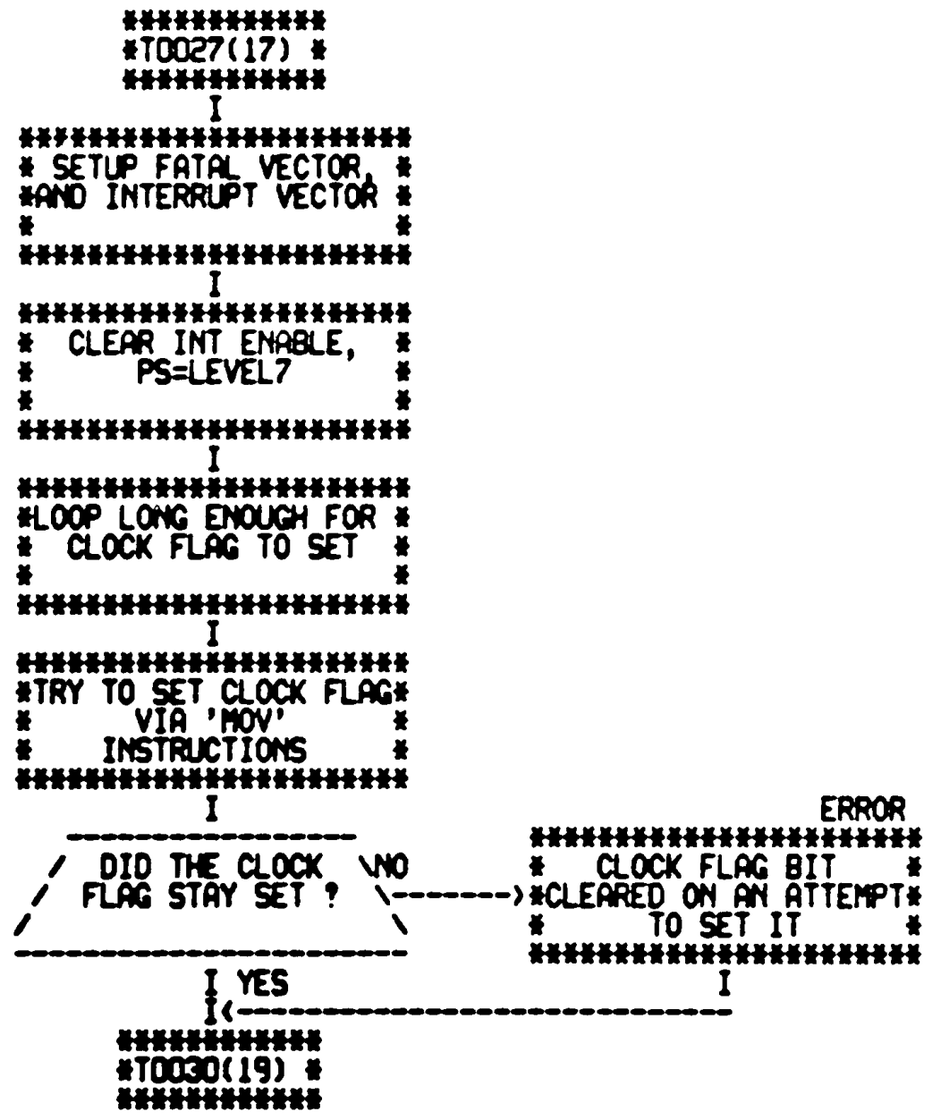

T0022(12)
INITIALIZE STACK ANS PS
CLEAR THE LKS REGISTER
TRY TO SET BIT 14 OF THE LKS REGISTER USING 'MOVB'
WAS LKS BIT 6 AFFECTED
NO
ERROR
SHOULD HAVE SET BIT 6
YES
T0023(14)

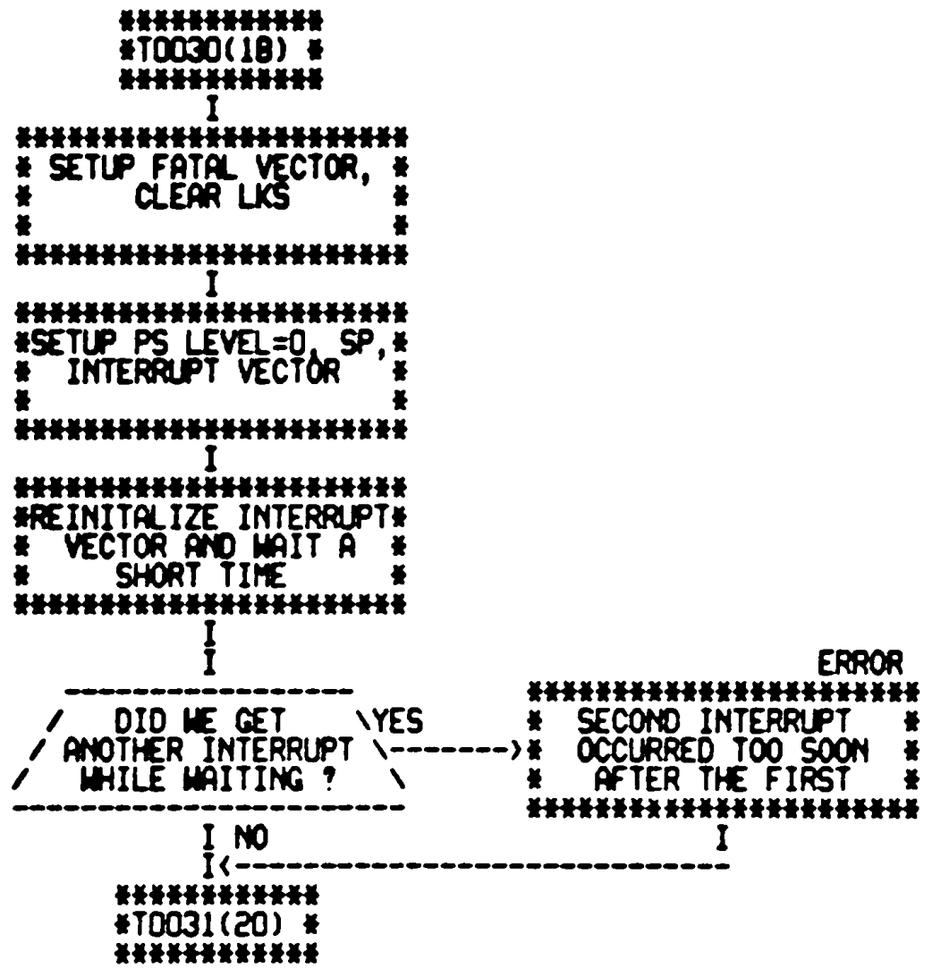

*T0023(13) *
SETUP FATAL VECTOR
CLEAR CLOCK FLAG THEN
WAIT FOR IT TO SET
AGAIN
MOVE A 1 INTO THE
CLOCK FLAG BIT
DID THE CLOCK
FLAG BIT STAY SET ?
NO
YES
ERROR
CLOCK FLAG BIT WAS
CLEARED BY TRYING TO
MOVE A 1 TO IT
*T0024(15) *

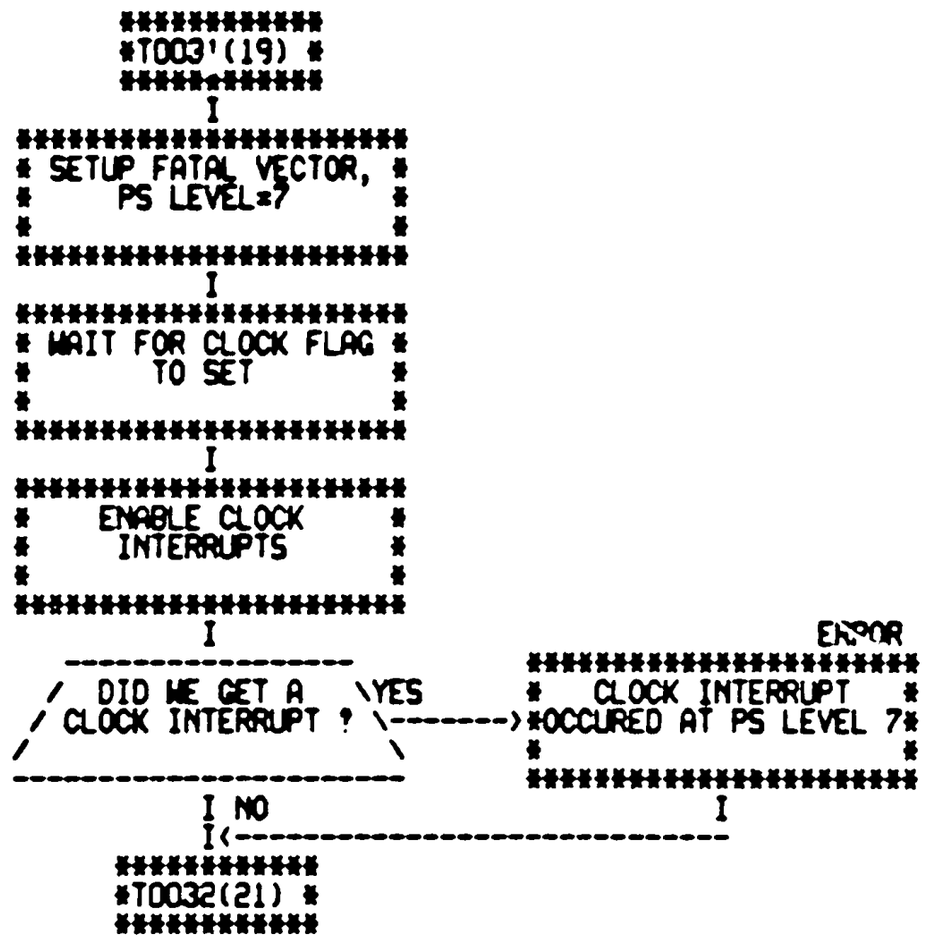

#T0024(14) #
SETUP PS LEVEL=7,
THEN TRY TO SET
LKS=300
DO A "RESET"
DID RESET CLEAR
FLAG AND SET INT
ENABLE ?
NO
ERROR
RESET DID NOT
INITIALIZE LKS
PROPERLY
YES
#T0025(16) #

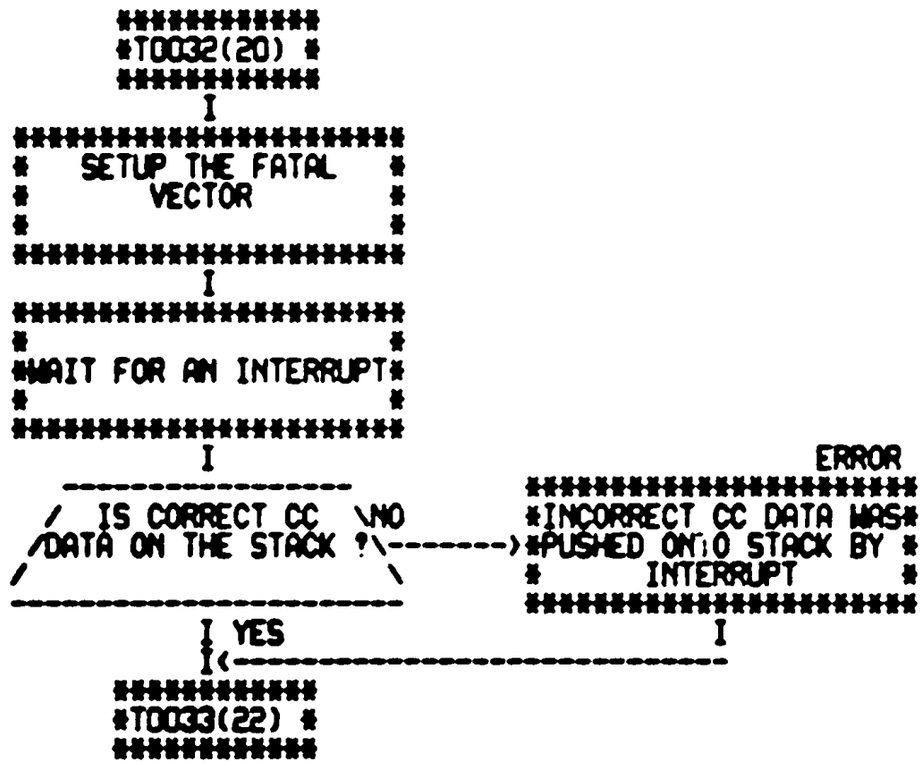

*T0025(15) *
SETUP CLOCK INTERRUPT
* VECTOR AND FATAL *
* VECTOR *
* WAIT FOR THE CLOCK *
* FLAG TO SET *
SET PS LEVEL=0, CLEAR
* CLOCK FLAG, ENABLE *
* CLOCK INTERRUPTS *
ERROR
CONT
DO A WAIT INSTRUCTION
INTRPT
WAIT MEANS "NO SACK"
* HAS OCCURRED *
* CONTINUED ON FROM *
TEST LKS REGISTER FOT
* CORRECT VALUE *
I HANG
*T0026(17) *
*T0026(17) *
*T0026(17) *
* NOT GETTING CLOCK *
* INTERRUPT-HUNG *
* PROGRAM *

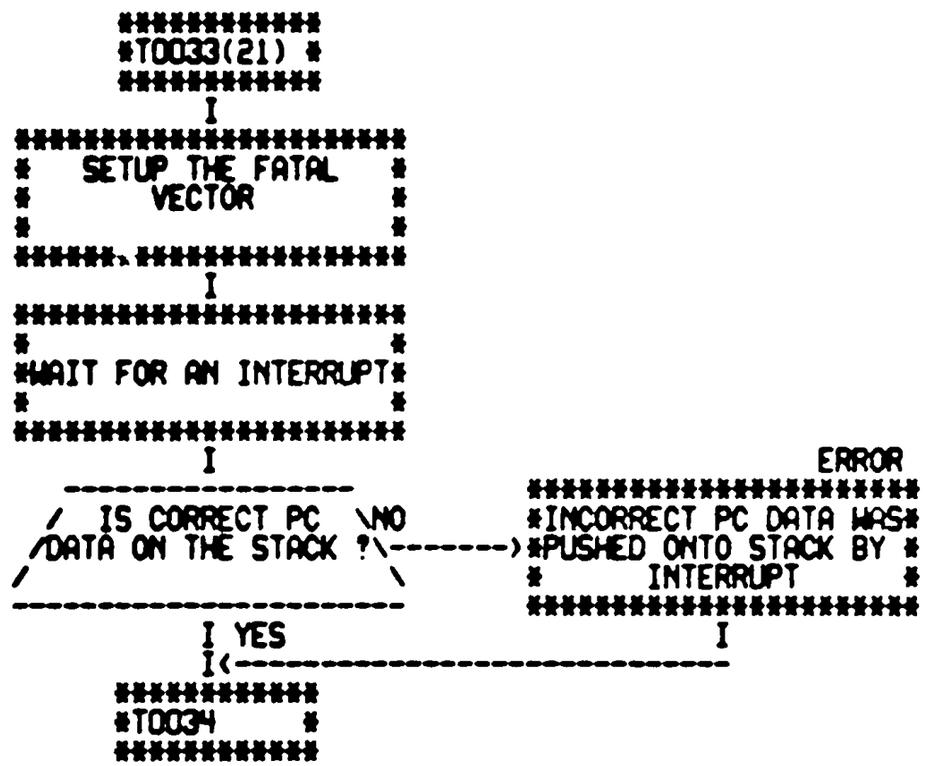

T0026(16)
SETUP FATAL VECTOR, INTERRUPT VECTOR AND PS LEVEL=7
INIT SO, SET INTERRUPT ENABLE BIT
STALL LONG ENOUGH FOR CLOCK FLAG TO SET
DO A "RESET"
DID RESET CLEAR THE CLOCK FLAG ?
YES
ERROR
RESET SHOULD NOT HAVE CLEARED THE CLOCK FLAG
NO
T0027(18)


#TOO27(17) #
SETUP FATAL VECTOR, AND INTERRUPT VECTOR
CLEAR INT ENABLE, PS=LEVEL7
LOOP LONG ENOUGH FOR CLOCK FLAG TO SET
TRY TO SET CLOCK FLAG VIA 'MOV' INSTRUCTIONS
DID THE CLOCK FLAG STAY SET ?
NO
ERROR
CLOCK FLAG BIT CLEARED ON AN ATTEMPT TO SET IT
YES
#TOO30(19) #


T0030(18)
SETUP FATAL VECTOR, CLEAR LKS
SETUP PS LEVEL=0, SP, INTERRUPT VECTOR
REINITALIZE INTERRUPT VECTOR AND WAIT A SHORT TIME
DID WE GET ANOTHER INTERRUPT WHILE WAITING ?
YES
ERROR
SECOND INTERRUPT OCCURRED TOO SOON AFTER THE FIRST
NO
T0031(20)


*T003'(19) *
SETUP FATAL VECTOR, PS LEVEL=7
WAIT FOR CLOCK FLAG TO SET
ENABLE CLOCK INTERRUPTS
DID WE GET A CLOCK INTERRUPT ?
YES
ERROR
CLOCK INTERRUPT OCCURED AT PS LEVEL 7
NO
*T0032(21) *


T0032(20)
SETUP THE FATAL VECTOR
WAIT FOR AN INTERRUPT
IS CORRECT CC DATA ON THE STACK ?
NO
ERROR
INCORRECT CC DATA WAS PUSHED ONTO STACK BY INTERRUPT
YES
T0033(22)


T0033(21)
SETUP THE FATAL VECTOR
WAIT FOR AN INTERRUPT
IS CORRECT PC DATA ON THE STACK ?
NO
ERROR
INCORRECT PC DATA WAS PUSHED ONTO STACK BY INTERRUPT
YES
T0034

ERROR	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18
	19	20	21	22														
T0001	01																	
T0002	01	02																
T0003	02	03																
T0004	03	04																
T0005	04	05																
T0006	05	06																
T0007	06	07																
T0010	07	08																
T0011	08	09																
T0012	09	10																
T0013	10	11																
T0014	11	12																
T0022	12	13																
T0023	13	14																
T0024	14	15																
T0025	15	16																
T0026	16	16	17															
T0027	17	18																
T0030	18	19																
T0031	19	20																
T0032	20	21																
T0033	21	22																
T0034	22																	

```
                                .ABS
                                .ENABL AMA
                                .LIST  ME
                                .NLIST  MC, MD, CND
            167400              $SWR=167400
            000000              $TN=0
                                        .ENABL  ABS
                                .MCALL  .HEADER,.SCATCH,.SEOP,.EQUAT,.SWRHI,.SWRLO,.$SCOPE,.SETUP
                                .MCALL  .$TYPOCT,.$TYPDEC,.STRAP,.SPOWER,.SERROR,.$TYPE,STARS,.SERRTYP,.$CMTAG
                                .TITLE  MAINDEC-11-DZKWA-D  LINE FREQUENCY CLOCK PROGRAM
(1)                             ;*COPYRIGHT (C) 1970,1972,1975
(1)                             ;*DIGITAL EQUIPMENT CORP.
(1)                             ;*MAYNARD, MASS. 01754
(1)                             ;*
(1)                             ;*PROGRAM BY J. COMEAU
(1)                             ;*
(1)                             ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
(1)                             ;*PACKAGE (MAINDEC-11-DZQAC-A1).
(1)                             ;*

                                .SBTTL  OPERATIONAL SWITCH SETTINGS
(1)                             ;*
(1)                             ;*      SWITCH                  USE
(1)                             ;*      ------          ------------------
(1)                             ;*        15            HALT ON ERROR
(1)                             ;*        14            LOOP ON TEST
(1)                             ;*        13            INHIBIT ERROR TYPEOUTS
(1)                             ;*        11            INHIBIT ITERATIONS
(1)                             ;*        10            BELL ON ERROR
(1)                             ;*         9            LOOP ON ERROR
(1)                             ;*         8            LOOP ON TEST IN SWR<7:0>
(1)                             ;*       7-0            #OF TEST TO LOOP ON IF SWR<8> IS SET

                                .SBTTL  BASIC DEFINITIONS
(1)
(1)                             ;*INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***
(1)             001100          STACK=  1100
(1)                             .EQUIV  EMT,ERROR               ;BASIC DEFINITION OF ERROR CALL
(1)                             .EQUIV  IOT,SCOPE               ;BASIC DEFINITION OF SCOPE CALL
(1)             177776          PS=     177776                  ;PROCESSOR STATUS WORD
(1)                             .EQUIV  PS,PSW
(1)             177774          STKLMT= 177774                  ;STACK LIMIT REGISTER
(1)             177772          PIRQ=   177772                  ;PROGRAM INTERRUPT REQUEST REGISTER
(1)             177570          SWR=    177570                  ;SWITCH REGISTER
(1)             177570          DISPLAY=SWR
(1)
(1)                             ;*GENERAL PURPOSE REGISTER DEFINITIONS
(1)             000000          R0=     %0                      ;GENERAL REGISTER
(1)             000001          R1=     %1                      ;GENERAL REGISTER
(1)             000002          R2=     %2                      ;GENERAL REGISTER
(1)             000003          R3=     %3                      ;GENERAL REGISTER
(1)             000004          R4=     %4                      ;GENERAL REGISTER
(1)             000005          R5=     %5                      ;GENERAL REGISTER
(1)             000006          R6=     %6                      ;GENERAL REGISTER
```

```
    (1)          000007                    R7=     %7                     ;GENERAL REGISTER
    (1)                                    .EQUIV  R6,SP                  ;STACK POINTER
    (1)                                    .EQUIV  R7,PC                  ;PROGRAM COUNTER
    (1)
    (1)                                    ;*"SWITCH REGISTER" SWITCH DEFINITIONS
    (1)          100000                    SW15=   100000
    (1)          040000                    SW14=   40000
    (1)          020000                    SW13=   20000
    (1)          010000                    SW12=   10000
    (1)          004000                    SW11=   4000
    (1)          002000                    SW10=   2000
    (1)          001000                    SW09=   1000
    (1)          000400                    SW08=   400
    (1)          000200                    SW07=   200
    (1)          000100                    SW06=   100
    (1)          000040                    SW05=   40
    (1)          000020                    SW04=   20
    (1)          000010                    SW03=   10
    (1)          000004                    SW02=   4
    (1)          000002                    SW01=   2
    (1)          000001                    SW00=   1
    (1)                                    .EQUIV  SW09,SW9
    (1)                                    .EQUIV  SW08,SW8
    (1)                                    .EQUIV  SW07,SW7
    (1)                                    .EQUIV  SW06,SW6
    (1)                                    .EQUIV  SW05,SW5
    (1)                                    .EQUIV  SW04,SW4
    (1)                                    .EQUIV  SW03,SW3
    (1)                                    .EQUIV  SW02,SW2
    (1)                                    .EQUIV  SW01,SW1
    (1)                                    .EQUIV  SW00,SW0
    (1)
    (1)                                    ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
    (1)          100000                    BIT15=  100000
    (1)          040000                    BIT14=  40000
    (1)          020000                    BIT13=  20000
    (1)          010000                    BIT12=  10000
    (1)          004000                    BIT11=  4000
    (1)          002000                    BIT10=  2000
    (1)          001000                    BIT09=  1000
    (1)          000400                    BIT08=  400
    (1)          000200                    BIT07=  200
    (1)          000100                    BIT06=  100
    (1)          000040                    BIT05=  40
    (1)          000020                    BIT04=  20
    (1)          000010                    BIT03=  10
    (1)          000004                    BIT02=  4
    (1)          000002                    BIT01=  2
    (1)          000001                    BIT00=  1
    (1)                                    .EQUIV  BIT09,BIT9
    (1)                                    .EQUIV  BIT08,BIT8
    (1)                                    .EQUIV  BIT07,BIT7
    (1)                                    .EQUIV  BIT06,BIT6
    (1)                                    .EQUIV  BIT05,BIT5
```

```
(1)                                 .EQUIV  BIT04,BIT4
(1)                                 .EQUIV  BIT03,BIT3
(1)                                 .EQUIV  BIT02,BIT2
(1)                                 .EQUIV  BIT01,BIT1
(1)                                 .EQUIV  BIT00,BIT0
(1)
(1)                                 ;*BASIC "CPU" TRAP VECTOR ADDRESSES
(1)         000004                  ERRVEC= 4               ;TIME OUT AND OTHER ERRORS
(1)         000010                  RESVEC= 10              ;RESERVED AND ILLEGAL INSTRUCTIONS
(1)         000014                  TBITVEC=14              ;"T" BIT
(1)         000014                  TRTVEC= 14              ;TRACE TRAP
(1)         000014                  BPTVEC= 14              ;BREAKPOINT TRAP (BPT)
(1)         000020                  IOTVEC= 20              ;INPUT/OUTPUT TRAP (IOT) **SCOPE**
(1)         000024                  PWRVEC= 24              ;POWER FAIL
(1)         000030                  EMTVEC= 30              ;EMULATOR TRAP (EMT) **ERROR**
(1)         000034                  TRAPVEC=34              ;"TRAP" TRAP
(1)         000060                  TKVEC=  60              ;TTY KEYBOARD VECTOR
(1)         000064                  TPVEC=  64              ;TTY PRINTER VECTOR
(1)         000240                  PIRQVEC=240             ;PROGRAM INTERRUPT REQUEST VECTOR
 29                                 ;MISCELANHUS EQUATES
 30         177546                  LKS=177546
 31         000240                  NOP=240
 32         000774                  BUF2=774
 33         000776                  BUF1=776
 34
(1)                                 .SBTTL  TRAP CATCHER
(1)
(1)         000000                          .=0
(1)                                 ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
(1)                                 ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
(1)                                 ;*LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
(1)
(1)                                 .SBTTL  STARTING ADDRESS(ES)
(1)         000200                          .=200
(1)
(1)  000200 000137  001400                  JMP     @#KSTART                ;JUMP TO STARTING ADDRESS OF PROGRAM
 38         000050                          .=50
 39  000050 000000                          .WORD   0
 40  000052 000000                          .WORD   0
```

```
 41                                 ;;*****************************************************************
(1)
(1)                                 .SBTTL  COMMON TAGS
(1)
(1)                                 ;*THIS TABLE CONTAINS VARIOUS COMMON STORAGE LOCATIONS
(1)                                 ;*USED IN THE PROGRAM.
(1)
(1)          000046                         .=46
(1)  000046  005640                         $ENDAD                          ;LOGICAL END OF PROGRAM
(1)
(1)          001100                         .=1100
(1)
(1)  001100                         $CMTAG:                                 ;START OF COMMON TAGS
(1)  001100  000000                 $PASS:  .WORD   0                       ;CONTAINS PASS COUNT
(1)  001102     000                 $TSTNM: .BYTE   0                       ;CONTAINS THE TEST NUMBER
(1)  001103     000                 $ERFLG: .BYTE   0                       ;CONTAINS ERROR FLAG
(1)  001104  000000                 $ICNT:  .WORD   0                       ;CONTAINS SUBTEST ITERATION COUNT
(1)  001106  000000                 $LPADR: .WORD   0                       ;CONTAINS SCOPE LOOP 1100
(1)  001110  000000                 $LPERR: .WORD   0                       ;CONTAINS SCOPE RETURN FOR ERRORS
(1)  001112  000000                 $ERTTL: .WORD   0                       ;CONTAINS TOTAL ERRORS DETECTED
(1)  001114     000                 $ITEMB: .BYTE   0                       ;CONTAINS ITEM CONTROL BYTE
(1)  001115     001                 $ERMAX: .BYTE   1                       ;CONTAINS MAX. ERRORS PER TEST
(1)  001116  000000                 $ERRPC: .WORD   0                       ;CONTAINS PC OF LAST ERROR INSTRUCTION
(1)  001120  000000                 $GDADR: .WORD   0                       ;CONTAINS 1100 OF 'GOOD' DATA
(1)  001122  000000                 $BDADR: .WORD   0                       ;CONTAINS 1100 OF 'BAD' DATA
(1)  001124  000000                 $GDDAT: .WORD   0                       ;CONTAINS 'GOOD' DATA
(1)  001126  000000                 $BDDAT: .WORD   0                       ;CONTAINS 'BAD' DATA
(1)  001130  000000  000000  000000         .WORD   0,0,0                   ;RESERVED--NOT TO BE USED
(1)  001136  177560                 $TKS:   177560                          ;TTY KBD STATUS
(1)  001140  177562                 $TKB:   177562                          ;TTY KBD BUFFER
(1)  001142  177564                 $TPS:   177564                          ;TTY PRINTER STATUS REG. 1100
(1)  001144  177566                 $TPB:   177566                          ;TTY PRINTER BUFFER REG. 1100
(1)  001146     000                 $NULL:  .BYTE   0                       ;CONTAINS NULL CHARACTER FOR FILLS
(1)  001147     002                 $FILLS: .BYTE   2                       ;CONTAINS # OF FILLER CHARACTERS REQUIRED
(1)  001150     012                 $FILLC: .BYTE   12                      ;INSERT FILL CHARS. AFTER A "LINE FEED"
(1)  001151     000                 $TPFLG: .BYTE   0                       ;"TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
(1)  001152  000000                 $REGAD: .WORD   0                       ;CONTAINS THE 1100 FROM
(1)                                                                         ;WHICH  ($REGO) WAS OBTAINED
(3)  001154  000000                 $REG0:  .WORD   0                       ;CONTAINS (($PEGAD)+0)
(3)  001156  000000                 $REG1:  .WORD   0                       ;CONTAINS (($REGAD)+2)
(3)  001160  000000                 $REG2:  .WORD   0                       ;CONTAINS (($REGAD)+4)
(3)  001162  000000                 $REG3:  .WORD   0                       ;CONTAINS (($REGAD)+6)
(3)  001164  000000                 $REG4:  .WORD   0                       ;CONTAINS (($REGAD)+10)
(3)  001166  000000                 $REG5:  .WORD   0                       ;CONTAINS (($REGAD)+12)
(3)  001170  000000                 $REG6:  .WORD   0                       ;CONTAINS (($REGAD)+14)
(3)  001172  000000                 $REG7:  .WORD   0                       ;CONTAINS (($REGAD)+16)
(3)  001174  000000                 $TMP0:  .WORD   0                       ;USER DEFINED
(3)  001176  000000                 $TMP1:  .WORD   0                       ;USER DEFINED
(3)  001200  000000                 $TMP2:  .WORD   0                       ;USER DEFINED
(3)  001202  000000                 $TMP3:  .WORD   0                       ;USER DEFINED
(3)  001204  000000                 $TMP4:  .WORD   0                       ;USER DEFINED
(3)  001206  000000                 $TMP5:  .WORD   0                       ;USER DEFINED
(3)  001210  000000                 $TMP6:  .WORD   0                       ;USER DEFINED
(3)  001212  000000                 $TMP7:  .WORD   0                       ;USER DEFINED
```

```
(1)  001214  000000                 $TIMES: 0                          ;MAX. NUMBER OF ITERATIONS
(1)  001216  000000                 $ESCAPE:0                          ;ESCAPE ON ERROR 1100
(1)  001220  177607  000377         $BELL:  .ASCIZ  <207><377><377>    ;CODE FOR BELL
(1)  001224     077                 $QUES:  .ASCII  /?/                ;QUESTION MARK
(1)  001225     015                 $CRLF:  .ASCII  <15>               ;CARRIAGE RETURN
(1)  001226  000012                 $LF:    .ASCIZ  <12>               ;LINE FEED
(3)  001230  000000                 WORD:   000000
```

```
(2)                                 ;;*****************************************************************
(1)
(1)                                 .SBTTL  ERROR POINTER TABLE
(1)
(1)                                 ;*THIS TABLE CONTAINS THE INFORMATION FOR EACH ERROR THAT CAN OCCUR.
(1)                                 ;*THE INFORMATION IS OBTAINED BY USING THE INDEX NUMBER FOUND IN
(1)                                 ;*LOCATION $ITEMB. THIS NUMBER INDICATES WHICH ITEM IN THE TABLE IS PERTINENT.
(1)                                 ;*NOTE1:        IF $ITEMB IS 0 THE ONLY PERTINENT DATA IS ($ERRPC).
(1)                                 ;*NOTE2:        EACH ITEM IN THE TABLE CONTAINS 4 POINTERS EXPLAINED AS FOLLOWS:
(1)
(1)                                 ;*      EM              ;POINTS TO THE ERROR MESSAGE
(1)                                 ;*      DH              ;POINTS TO THE DATA HEADER
(1)                                 ;*      DT              ;POINTS TO THE DATA
(1)                                 ;*      DF              ;POINTS TO THE DATA FORMAT
(1)
(1)
(1)  001232                         $ERRTB:
 42  001232  007752                         EM1     ;"                                      LKS     LKS     "
 43  001234  010033                         DH1     ;"PC      PS      SP      TEST#   WAS     S/B     "
 44  001236  010114                         DT1     ;$ERRPC,$REG7,$REG6,$REG5,LKS,$GDDAT
 45  001240  000000                         0
 46
 47  001242  010132                         EM2     ;"CLOCK FAILED TO INTERRUPT"
 48  001244  010164                         DH2     ;"PC      PS      SP      TEST#   LKS     "
 49  001246  010236                         DT2     ;$ERRPC,$REG7,$REG6,$REG5,LKS
 50  001250  000000                         0
 51
 52  001252  010252                         EM3     ;"CLOCK INTERRUPTED WHEN THE PROCESSOR PRIORITY WAS TOO HIGH"
 53  001254  010345                         DH3     ;"PC      PS      SP      TEST#   LKS     "
 54  001256  010416                         DT3     ;$ERRPC,$REG7,$REG6,$REG5,LKS
 55  001260  000000                         0
 56
 57  001262  010432                         EM4     ;"CLOCK GIVES UNEQUAL # OF PULSES OVER TWO EQUAL PERIODS OF TIME"
 58  001264  010531                         DH4     ;"PC      PS      SP      TEST#   1ST     2ND"
 59  001266  010666                         DT4     ;$ERRPC,$REG7,$REG6,$REG5,$REG1,$REG0
 60  001270  000000                         0
 61
 62  001272  010704                         EM5     ;"LKS REGISTER RESPONDS TO ANOTHER ADDRESS"
 63  001274  010755                         DH5     ;"PC      PS      SP      TEST#   ADDRESS"
 64  001276  011026                         DT5     ;$ERRPC,$REG7,$REG6,$REG5,$GDADR
 65  001300  000000                         0
 66
 67  001302  011042                         EM6     ;"A NO SACK TIMEOUT HAS OCCURED"
 68  001304  011100                         DH6     ;"PC      PS      SP      TEST#   LKS     "
 69  001306  011152                         DT6     ;$ERRPC,$REG7,$REG6,$REG5,LKS
 70  001310  000000                         0
 71
 72  001312  011166                         EM7     ;"WRONG CONDITION CODES WERE PUT ONTO STACK BY INTERRUPT"
 73  001314  011255                         DH7     ;"PC      PS      SP      TEST#   CC      CC"
 74  001316  011334                         DT7     ;$ERRPC,$REG7,$REG6,$REG5,BUF1,$GDDAT
 75  001320  000000                         0
 76
 77  001322  011352                         EM10    ;"WRONG PC PUT ONTO THE STACK BY AN INTERRUPT"
 78  001324  011426                         DH10    ;"PC      PS      SP      TEST#   "
```

```
     79  001326  011512                          DT10    ;$ERRPC,$REG7,$REG6,$REG5,BUF2,$GDDAT
     80  001330  000000                          0
     81
     82  001332  011530                          EM11    ;"TRAPPED TRYING TO ACCESS LKS REGISTER"
     83  001334  011606                          DH11    ;"(PC)    (PS)    (SP)    TEST#"
     84  001336  011644                          DT11    ;$ERRPC,$REG7,$REG6,$REG5
     85  001340  000000                  0
     86
     87
     88                                   ;STARTUP CODE
     89          001400                   .=1400
     90  001400  012706  001000           KSTART: MOV     #1000,SP                ;INITIALIZE THE STACK SO WE CAN CALL THE TYPEOUT
     91  001404  013746  177776                   MOV     PS,-(SP)                ;SAVE STATUS
     92  001410  004737  006216                   JSR     PC,$TYPE                ;PRINTOUT STARTUP MESSAGE
     93  001414  007604                           STMES                           ;ADDRESS OF MESSAGE "MAINDEC-11-DZKWA-D"
     94  001416                           START:
(1)  001416  012706  001100                       MOV     #$CMTAG,R6              ;FIRST LOCATION TO BE CLEARED
(1)  001422  005026                               CLR     (R6)+                   ;CLEAR MEMORY LOCATION
(1)  001424  022706  001136                       CMP     #$TKS,R6                ;DONE?
(1)  001430  001374                               BNE     .-6                     ;LOOP BACK IF NO
(1)  001432  012706  001000                       MOV     #1000,SP                        ;SETUP THE STACK POINTER
(1)  001436  012737  005746  000020               MOV     #$SCOPE,@#IOTVEC        ;IOT VECTOR FOR SCOPE ROUTINE
(1)  001444  012737  000340  000022               MOV     #340,@#IOTVEC+2         ;LEVEL 7
(1)  001452  012737  007132  000030               MOV     #$ERROR,@#EMTVEC        ;EMT VECTOR FOR ERROR ROUTINE
(1)  001460  012737  000340  000032               MOV     #340,@#EMTVEC+2         ;LEVEL 7
(1)  001466  012737  007324  000034               MOV     #$TRAP,@#TRAPVEC        ;TRAP VECTOR FOR TRAP CALLS
(1)  001474  012737  000340  000036               MOV     #340,@#TRAPVEC+2        ;LEVEL 7
(1)  001502  012737  007356  000024               MOV     #$PWRDN,@#PWRVEC        ;POWER FAILURE VECTOR
(1)  001510  012737  000340  000026               MOV     #340,@#PWRVEC+2         ;LEVEL 7
(1)  001516  013737  005610  005602               MOV     $ENDCT,$EOPCT           ;SETUP END-OF-PROGRAM COUNTER
(1)  001524  112737  000001  001115               MOVB    #1,$ERMAX               ;ALLOW ONE ERROR PER TEST
(1)  001532  012737  001532  001106               MOV     #.,$LPADR               ;INITIALIZE THE LOOP ADDRESS FOR SCOPE
     95  001540  005737  000042                   TST     42                      ;LOADED BY A MONITOR
     96  001544  001401                           BEQ     T0001                   ;BR IF NO
     97  001546  000005                           RESET                           ;YES--GENERATE AN INIT
     98
     99
    100
    101                                   .SBTTL  TEST THAT THE LKS CAN BE REFERENCED WITHOUT A BUS ERROR
    102                                   ;LKS ACCESS TEST
    103  001550  000004                   T0001:  SCOPE
    104  001552  012737  001606  000004           MOV     #E0001,@#4              ;PREPARE FOR ADDRESSING THE LKS REGISTER. BAD HARDWARE
    105  001560  012737  000340  000006           MOV     #340,@#6                ;COULD CAUSE A TRAP TO 4
    106  001566  012737  001574  001106           MOV     #R0001,$LPADR           ;TIGHTEN UP THE SCOPE LOOP A BIT IN CASE OF AN ERROR
    107  001574  012706  001000           R0001:  MOV     #1000,SP                ;SETUP THE STACK POINTER IN CASE OF AN ERROR
    108  001600  005037  177546           I0001:  CLR     @#LKS                   ;JUST REFERENCE LKS. DONT WORRY IF IT DIDNT CLEAR YET
    109  001604  000401                           BR      T0002                   ;WE DIDNT TRAP IF WE REACH HERE. GO ON TO NEXT TEST
    110  001606  104011                   E0001:  ERROR 11                        ;ERROR:::TRAPED TRYING TO ACCESS THE LKS REGISTER
    111
    112
    113
    114                                   .SBTTL  TEST THAT START CLEARS LINE CLOCK INTERRUPT ENABLE BIT
    115                                   ;TEST THAT START CLEARS LINE CLOCK INTERRUPT ENABLE BIT
    116  001610  000004                   T0002:  SCOPE
```

```
   117  001612  012737  005674  000004          MOV     #TRAP0,@#4      ;SETUP VECOR IN CASE OF UNFORSEEN PROBLEMS
   (1)  001620  012737  000340  000006          MOV     #340,@#6        ;NO INTERRUPTS WHILE PRINTING FATAL MESSAGE
   118  001626  012737  001634  001106          MOV     #R0002,$LPADR   ;SETUP LOOPBACK ADDRESS IN CASE OF AN ERROR
   119  001634  000005                  R0002:  RESET
   120  001636  012737  000200  001124          MOV     #200,$GDDAT     ;HAVE GOOD DATA INFO READY FOR TYPEOUT IN CASE OF AN ERR
   121  001644  032737  000100  177546          BIT     #100,LKS        ;TEST THE INTERRUPT ENABLE BIT
   122  001652  001401                          BEQ     T0003
   123  001654  104001                  E0002:  ERROR 1                 ;ERROR, CLOCK INTERRUPT ENABLE NOT CLEARED BY INIT
   124
   125
   126
   127                                  .SBTTL  TEST THAT START SETS CLOCK FLAG
   128                                  ;TEST THAT START SETS CLOCK FLAG
   129  001656  000004                  T0003:  SCOPE
   130  001660  012737  005674  000004          MOV     #TRAP0,@#4      ;SETUP VECOR IN CASE OF UNFORSEEN PROBLEMS
   (1)  001666  012737  000340  000006          MOV     #340,@#6        ;NO INTERRUPTS WHILE PRINTING FATAL MESSAGE
   131  001674  012737  000200  001124          MOV     #200,$GDDAT     ;HAVE GOOD DATA INFO READY FOR TYPEOUT IN CASE OF AN ERR
   132  001702  012737  001710  001106          MOV     #R0003,$LPADR   ;SETUP LOOPBACK ADDRESS IN CASE OF AN ERROR
   133  001710  000005                  R0003:  RESET                   ;SHOULD SET THE  CLOCK FLAG
   134  001712  105737  177546                  TSTB    LKS             ;FIND OUT IF IT DID
   135  001716  100401                          BMI     T0004           ;GO ON TO THE NEXT TEST IF IT SET THE CLOCK FLAG
   136  001720  104001                  E0003:  ERROR 1                 ;ERROR, CLOCK FLAG NOT SET BY INIT
   137
   138
   139
   140                                  .SBTTL  TEST THAT CLOCK FLAG WILL SET AFTER SUFFICIENT PERIOD OF TIME (20 MS MIN)
   141                                  ;TEST THAT CLOCK FLAG WILL SET AFTER SUFFICIENT PERIOD OF TIME (20 MS MIN)
   142  001722  000004                  T0004:  SCOPE
   143  001724  012737  005674  000004          MOV     #TRAP0,@#4      ;SETUP VECOR IN CASE OF UNFORSEEN PROBLEMS
   (1)  001732  012737  000340  000006          MOV     #340,@#6        ;NO INTERRUPTS WHILE PRINTING FATAL MESSAGE
   144  001740  012737  001746  001106          MOV     #R0004,$LPADR   ;SETUP LOOPBACK ADDRESS IN CASE OF AN ERROR
   145  001746  012737  000200  001124  R0004:  MOV     #200,$GDDAT     ;HAVE GOOD DATA INFO READY FOR TYPEOUT IN CASE OF AN ERR
   146  001754  005037  177546                  CLR     LKS             ;CLEAR THE CLOCK FLAG
   147  001760  005000                          CLR     R0              ;AND A TIMER LOCATION
   148  001762  105737  177546          A0004:  TSTB    LKS             ;IS CLOCK FLAG SET
   149  001766  100403                          BMI     T0005
   150  001770  005200                          INC     R0              ;NO, INCREMENT COUNT DO3 WAIT FOR SOMEMORE
   151  001772  00137ง                          BNE     A0004           ;WAIT SUFFICIENT AMOUNT OF TIME FOR CLOCK
   152  001774  104001                  E0004:  ERROR 1                 ;ERROR, CLOCK FLAG FAILED TO SET
   153
   154
   155
   156                                  .SBTTL  TEST THAT INTERRUPT ENABLE BIT MAY BE SET
   157                                  ;TEST THAT INTERRUPT ENABLE BIT MAY BE SET
   158  001776  000004                  T0005:  SCOPE
   159  002000  012737  005674  000004          MOV     #TRAP0,@#4      ;SETUP VECOR IN CASE OF UNFORSEEN PROBLEMS
   (1)  002006  012737  000340  000006          MOV     #340,@#6        ;NO INTERRUPTS WHILE PRINTING FATAL MESSAGE
   160  002014  012737  000100  001124          MOV     #100,$GDDAT     ;HAVE GOOD DATA INFO READY FOR TYPEOUT IN CASE OF AN ERR
   161  002022  012737  002036  001106          MOV     #R0005,$LPADR   ;SETUP LOOP BACK ADDRESS IN CASE OF ERROR
   162  002030  012737  000340  177776          MOV     #340,PS         ;SET PRIORITY TO LEVEL 7, NO INTERRUPTS
   163  002036  005037  177546          R0005:  CLR     LKS
   164  002042  005003                          CLR     R3              ;INITIALIZE A COUNTER LOCATION
   (1)  002044  105737  177546          A0005:  TSTB    LKS             ;IS THE CLOCK FLAG SET?
   (1)  002050  100404                          BMI     B0005           ;IF SO, CONTINUE ON WITH THE TEST
```

```
(1)  002052  005203                        INC     R3              ;IF NOT INCREMENT THE COUNTER LOCATION
(1)  002054  001373                        BNE     A0005           ;AND GO TEST THE CLOCK FLAG AGAIN. UNLESS...
(1)  002056  104001                E0005:   ERROR 1                 ;CLOCK FLAG DID NOT SET AFTER A WAITING PERIOD > 20 MS
(1)  002060  000410                        BR      T0006
(1)  002062                        B0005:
165  002062  012737  000100  177546        MOV     #100,LKS        ;CLEAR CLOCK FLAG AND SET INTERRUPT ENABLE
166  002070  032737  000100  177546        BIT     #100,LKS        ;IS INTERRUPT ENABLE SET?
167  002076  001001                        BNE     T0006
168  002100  104001                E1005:   ERROR 1                 ;ERROR INTERRUPT ENABLE NOT SET
169
170
171
172                                .SBTTL  TEST THAT INTERRUPT ENABLE BIT MAY BE CLEARED
173                                ;TEST THAT INTERRUPT ENABLE BIT MAY BE CLEARED
174  002102  000004                T0006:   SCOPE
175  002104  012737  005674  000004        MOV     #TRAP0,@#4      ;SETUP VECOR IN CASE OF UNFORSEEN PROBLEMS
(1)  002112  012737  000340  000006        MOV     #340,@#6        ;NO INTERRUPTS WHILE PRINTING FATAL MESSAGE
176  002120  012737  000000  001124        MOV     #0,$GOODAT
177  002126  012737  002142  001106        MOV     #R0006,$LPADR   ;INITIALIZE THE LOOPBACK ADDRESS IN CASE OF AN ERROR
178  002134  012737  000340  177776        MOV     #340,PS         ;SET PRIORITY LEVEL TO 7. NO INTERRUPTS
179  002142  005037  177546        R0006:  CLR     LKS
180  002146  005003                        CLR     R3              ;INITIALIZE A COUNTER LOCATION
(1)  002150  105737  177546        A0006:  TSTB    LKS             ;IS THE CLOCK FLAG SET?
(1)  002154  100404                        BMI     B0006           ;IF SO, CONTINUE ON WITH THE TEST
(1)  002156  005203                        INC     R3              ;IF NOT INCREMENT THE COUNTER LOCATION
(1)  002160  001373                        BNE     A0006           ;AND GO TEST THE CLOCK FLAG AGAIN. UNLESS...
(1)  002162  104001                E0006:   ERROR 1                 ;CLOCK FLAG DID NOT SET AFTER A WAITING PERIOD > 20 MS
(1)  002164  000412                        BR      T0007
(1)  002166                        B0006:
181  002166  012737  000100  177546        MOV     #100,LKS        ;CLEAR CLOCK FLAG AND SET INTERRUPT ENABLE
182  002174  005037  177546                CLR     LKS             ;CLEAR INTERRUPT ENABLE
183  002200  032737  000100  177546        BIT     #100,LKS        ;TEST THE INTERRUPT ENABLE BIT
184  002206  001401                        BEQ     T0007           ;IS INTERRUPT ENABLE CLEARED
185  002210  104001                E10006:  ERROR 1                 ;ERROR, ERROR INTERRUPT BIT CAN NOT BE CLEARED
186
187
188
189                                .SBTTL  TEST THAT CLOCK INTERRUPTS TO CORRECT VECTOR ADDRESS
190                                ;TEST THAT CLOCK INTERRUPTS TO CORRECT VECTOR ADDRESS
191  002212  000004                T0007:   SCOPE
192  002214  012737  005674  000004        MOV     #TRAP0,@#4      ;SETUP VECOR IN CASE OF UNFORSEEN PROBLEMS
(1)  002222  012737  000340  000006        MOV     #340,@#6        ;NO INTERRUPTS WHILE PRINTING FATAL MESSAGE
193  002230  012737  000300  001124        MOV     #300,$GOODAT    ;HAVE GOOD DATA INFO READY FOR TYPEOUT IN CASE OF AN ERR
194  002236  012737  002260  001106        MOV     #R0007,$LPADR   ;INITIALIZE THE LOOPBACK ADDRESS IN CASE OF AN ERROR
195  002244  012737  002340  000100        MOV     #B0007,100      ;SET UP VECTOR RETURN POINTER
196  002252  012737  000340  000102        MOV     #340,@#102      ;1 INTERRUPT IS ENOUGH
197  002260  012706  001000        R0007:  MOV     #1000,SP        ;GET STACK READY FOR INTERRUPTS
198  002264  012737  000200  177776        MOV     #200,PS         ;SET PROCESSOR PRIORITY 4
199  002272  005037  177546                CLR     LKS
200  002276  005003                        CLR     R3              ;INITIALIZE A COUNTER LOCATION
(1)  002300  105737  177546        A0007:  TSTB    LKS             ;IS THE CLOCK FLAG SET?
(1)  002304  100404                        BMI     B0007           ;IF SO, CONTINUE ON WITH THE TEST
(1)  002306  005203                        INC     R3              ;IF NOT INCREMENT THE COUNTER LOCATION
(1)  002310  001373                        BNE     A0007           ;AND GO TEST THE CLOCK FLAG AGAIN. UNLESS...
```

```
(1)  002312  104001                    E0007:  ERROR 1                 ;CLOCK FLAG DID NOT SET AFTER A WAITING PERIOD > 20 MS
(1)  002314  000415                            BR      T0010
(1)  002316                             B0007:
201  002316  012737  000100  177546            MOV     #100,LKS        ;ENABLE INTERRUPT
202  002324  005000                            CLR     R0
203  002326  005200                    C0007:  INC     R0
204  002330  000240                            NOP                     ;STALL FOR TIME
205  002332  001375                            BNE     C0007           ;WAIT FOR INTERRUPT
206  002334  104002                    E10007: ERROR 2                 ;ERROR, DIDNT GET INTERRUPT
207  002336  000404                            BR      T0010
208  002340  105737  177546            D0007:  TSTB    LKS             ;ENTER HERE IF INTERRUPTED
209  002344  100401                            BMI     T0010
210  002346  104001                    E20007: ERROR 1                 ;ERROR, INTERRUPT NOT CAUSED BY CLOCK
211
212
213
214                                     .SBTTL  TEST THAT CLOCK WILL INTERRUPT WITH PROCESSOR AT PRIORITY 5
215                                     ;TEST THAT CLOCK WILL INTERRUPT WITH PROCESSOR AT PRIORITY 5
216  002350  000004                    T0010:  SCOPE
217  002352  012737  005674  000004            MOV     #TRAP0,@#4      ;SETUP VECOR IN CASE OF UNFORSEEN PROBLEMS
(1)  002360  012737  000340  000006            MOV     #340,@#6        ;NO INTERRUPTS WHILE PRINTING FATAL MESSAGE
218  002366  012737  002410  001106            MOV     #R0010,$LPADR   ;INITIALIZE THE LOOPBACK ADDRESS IN CASE OF AN ERROR
219  002374  012737  002470  000100            MOV     #D0010,100      ;SET UP VECTOR RETURN POINTER
220  002402  012737  000340  000102            MOV     #340,@#102      ;NO INTERRUPTS ALLOWED AFTER THE FIRST ONE
221  002410  005037  177546            R0010:  CLR     LKS
222  002414  012737  000240  177776            MOV     #240,PS         ;SET PRIORITY 5
223  002422  012706  001000                    MOV     #1000,SP        ;INITIALIZE THE STACK POINTER
224  002426  005003                            CLR     R3              ;INITIALIZE A COUNTER LOCATION
(1)  002430  105737  177546            A0010:  TSTB    LKS             ;IS THE CLOCK FLAG SET?
(1)  002434  100404                            BMI     B0010           ;IF SO, CONTINUE ON WITH THE TEST
(1)  002436  005203                            INC     R3              ;IF NOT INCREMENT THE COUNTER LOCATION
(1)  002440  001373                            BNE     A0010           ;AND GO TEST THE CLOCK FLAG AGAIN. UNLESS...
(1)  002442  104001                    E0010:  ERROR 1                 ;CLOCK FLAG DID NOT SET AFTER A WAITING PERIOD > 20 MS
(1)  002444  000415                            BR      T0011
(1)  002446                             B0010:
225  002446  012737  000100  177546            MOV     #100,LKS        ;ENABLE INTERRUPT
226  002454  005000                            CLR     R0
227  002456  005200                    C0010:  INC     R0
228  002460  000240                            NOP                     ;STALL FOR SOME TIME
229  002462  001375                            BNE     C0010           ;WAIT FOR INTERRUPT
230  002464  104002                    E10010: ERROR 2                 ;ERROR, INTERRUPT FAILED TO OCCUR
231  002466  000404                            BR      T0011
232  002470  105737  177546            D0010:  TSTB    LKS             ;ENTER HERE IF INTERRUPTED
233  002474  100401                            BMI     T0011
234  002476  104001                    E20010: ERROR 1                 ;ERROR, INTERRUPTDID NOT CLEAR THE CLOCK FLAG
235
236
237
238                                     .SBTTL  TEST THAT CLOCK WILL NOT INTERRUPT WITH PROCESSOR PRIORITY 6
239                                     ;TEST THAT CLOCK WILL NOT INTERRUPT WITH PROCESSOR PRIORITY 6
240  002500  000004                    T0011:  SCOPE
241  002502  012737  005674  000004            MOV     #TRAP0,@#4      ;SETUP VECOR IN CASE OF UNFORSEEN PROBLEMS
(1)  002510  012737  000340  000006            MOV     #340,@#6        ;NO INTERRUPTS WHILE PRINTING FATAL MESSAGE
242  002516  012737  002524  001106            MOV     #R0011,$LPADR   ;SETUP LOOPBACK ADDRESS IN CASE OF AN ERROR
```

```
                                R0011:  CLR     LKS
                                        CLR     R3              ;INITIALIZE A COUNTER LOCATION
(1)  002536  100404             A0011:  TSTB    LKS             ;IS THE CLOCK FLAG SET?
(1)  002536  100404                     BMI     B0011           ;IF SO, CONTINUE ON WITH THE TEST
(1)  002540  005203                     INC     R3              ;IF NOT INCREMENT THE COUNTER LOCATION
(1)  002542  001373                     BNE     A0011           ;AND GO TEST THE CLOCK FLAG AGAIN. UNLESS...
(1)  002544  104001             E0011:  ERROR 1                 ;CLOCK FLAG DID NOT SET AFTER A WAITING PERIOD > 20 MS
(1)  002546  000427                     BR      T0012
(1)  002550                     B0011:
002550  012706  001000                    MOV     #1000,SP        ;INITIALIZE THE STACK POINTER
002554  012737  000300  177776            MOV     #300,PS         ;SET PRIORITY 6
002562  012737  002612  000100            MOV     #E1011,100      ;SET UP VECTOR RETURN
002570  012737  000100  177546            MOV     #100,LKS        ;ENABLE INTERRUPT
002576  005003                            CLR     R3              ;INITIALIZE A COUNTER LOCATION
(1)  002600  105737  177546     C0011:  TSTB    LKS             ;IS THE CLOCK FLAG SET?
(1)  002604  100404                     BMI     D0011           ;IF SO, CONTINUE ON WITH THE TEST
(1)  002606  005203                     INC     R3              ;IF NOT INCREMENT THE COUNTER LOCATION
(1)  002610  001373                     BNE     C0011           ;AND GO TEST THE CLOCK FLAG AGAIN. UNLESS...
(1)  002612  104001             E1011:  ERROR 1                 ;CLOCK FLAG DID NOT SET AFTER A WAITING PERIOD > 20 MS
(1)  002614  000731                     BR      T0011
(1)  002616                     D0011:
002616  000240                            NOP
002620  000240                            NOP                     ;GIVE CLOCK EXTRA TIME TO INTERRUPT
002622  000401                            BR      T0012
002624  104003             E20011: ERROR 3                 ;ERROR, CLOCK INTERRUPTED WITHOUT HAVING PRIORITY
```

```
                                .SBTTL  TEST THAT RESET SETS CLOCK FLAG
                                ;TEST THAT RESET SETS CLOCK FLAG
                                T0012:  SCOPE
002626  000004
002630  012737  000200  001124        MOV     #200,$GDDAT     ;HAVE GOOD DATA INFO READY FOR TYPEOUT IN CASE OF AN ERR
002636  012737  005674  000004        MOV     #TRAP0,@#4      ;SETUP VECOR IN CASE OF UNFORSEEN PROBLEMS
(1)  002644  012737  000340  000006  MOV     #340,@#6        ;NO INTERRUPTS WHILE PRINTING FATAL MESSAGE
002652  012737  002660  001106        MOV     #R0012,$LPADR   ;SETUP LOOPBACK ADDRESS IN CASE OF AN ERROR
002660  005037  177546     R0012:  CLR     LKS             ;CLEAR CLOCK FLAG
002664  005003                     CLR     R3              ;INITIALIZE A COUNTER LOCATION
(1)  002666  105737  177546     A0012:  TSTB    LKS             ;IS THE CLOCK FLAG SET?
(1)  002672  100404                     BMI     B0012           ;IF SO, CONTINUE ON WITH THE TEST
(1)  002674  005203                     INC     R3              ;IF NOT INCREMENT THE COUNTER LOCATION
(1)  002676  001373                     BNE     A0012           ;AND GO TEST THE CLOCK FLAG AGAIN. UNLESS...
(1)  002700  104001             E0012:  ERROR 1                 ;CLOCK FLAG DID NOT SET AFTER A WAITING PERIOD > 20 MS
(1)  002702  000407                     BR      T0013
(1)  002704                     B0012:
002704  005037  177546                    CLR     LKS
002710  000005                            RESET                   ;SHOULD SET CLOCK FLAG
002712  105737  177546                    TSTB    LKS
002716  100401                            BMI     T0013
002720  104001             E10012: ERROR 1                 ;ERROR, RESET DIDN'T SET CLOCK FLAG
```

```
                                .SBTTL  TEST LINE CLOCK REPEATABILITY
                                ;TEST LINE CLOCK REPEATABILITY
```

```
                                        ;MAKE SURE THAT OVER TWO EQUAL PERIODS OF TIME
                                        ;THE CLOCK PUTS OUT THE SAME NUMBER OF PULSES
002722  000004                  T0013:  SCOPE
002724  005000                  R0013:  CLR     R0              ;CLEAR 1ST TIME COUNT
002726  005001                          CLR     R1              ;CLEAR 1ST CLOCK COUNT
002730  012737  000340  177776          MOV     #340,PS         ;SET PRIORITY 7
002736  012737  002736  001106  R1013:  MOV     #R1013,$LPADR   ;ERROR IN NEXT  FEW INSTRUCTIONS CAUSES A SHORT SCOPE LO
002744  005037  177546                  CLR     LKS
                                        ;SYNC ON CLOCK FLAG A COUPLE OF TIMES
002750  005003                          CLR     R3              ;INITIALIZE A COUNTER LOCATION
(1) 002752  105737  177546      A0013:  TSTB    LKS             ;IS THE CLOCK FLAG SET?
(1) 002756  100404                      BMI     B0013           ;IF SO, CONTINUE ON WITH THE TEST
(1) 002760  005203                      INC     R3              ;IF NOT INCREMENT THE COUNTER LOCATION
(1) 002762  001373                      BNE     A0013           ;AND GO TEST THE CLOCK FLAG AGAIN. UNLESS...
(1) 002764  104001              E0013:  ERROR 1                 ;CLOCK FLAG DID NOT SET AFTER A WAITING PERIOD > 20 MS
(1) 002766  000510                      BR      T0014
(1) 002770                      B0013:
002770  012737  002770  001106  R2013:  MOV     #R2013,$LPADR   ;MAKE SCOPE LOOP SHORT IN CASE OF AN ERROR
002776  005037  177546                  CLR     LKS
003002  005003                          CLR     R3              ;INITIALIZE A COUNTER LOCATION
(1) 003004  105737  177546      C0013:  TSTB    LKS             ;IS THE CLOCK FLAG SET?
(1) 003010  100404                      BMI     D0013           ;IF SO, CONTINUE ON WITH THE TEST
(1) 003012  005203                      INC     R3              ;IF NOT INCREMENT THE COUNTER LOCATION
(1) 003014  001373                      BNE     C0013           ;AND GO TEST THE CLOCK FLAG AGAIN. UNLESS...
(1) 003016  104001              E1013:  ERROR 1                 ;CLOCK FLAG DID NOT SET AFTER A WAITING PERIOD > 20 MS
(1) 003020  000473                      BR      T0014
(1) 003022                      D0013:
003022  005037  177546                  CLR     LKS
003026  105737  177546      F0013:  TSTB    LKS             ;IS CLOCK FLAG SET
003032  100003                          BPL     G0013           ;NO
003034  005201                          INC     R1              ;+1 TO CLOCK COUNT
003036  005037  177546                  CLR     LKS             ;CLEAR CLOCK IF SET
003042  005200                  G0013:  INC     R0              ;+1 TO TIME COUNT
003044  001370                          BNE     F0013           ;REPEAT UNTIL R0=0
003046  005000                          CLR     R0              ;CLEAR 2ND TIME COUNT
003050  005002                          CLR     R2              ;CLEAR 2ND CLOCK COUNT
003052  012737  003052  001106  R3013:  MOV     #R3013,$LPADR   ;INSURE A SHORT SCOPE LOOP
003060  005037  177546                  CLR     LKS
                                        ;SYNC ON CLOCK FLAG TWICE
003064  005003                          CLR     R3              ;INITIALIZE A COUNTER LOCATION
(1) 003066  105737  177546      H0013:  TSTB    LKS             ;IS THE CLOCK FLAG SET?
(1) 003072  100404                      BMI     J0013           ;IF SO, CONTINUE ON WITH THE TEST
(1) 003074  005203                      INC     R3              ;IF NOT INCREMENT THE COUNTER LOCATION
(1) 003076  001373                      BNE     H0013           ;AND GO TEST THE CLOCK FLAG AGAIN. UNLESS...
(1) 003100  104001              E2013:  ERROR 1                 ;CLOCK FLAG DID NOT SET AFTER A WAITING PERIOD > 20 MS
(1) 003102  000442                      BR      T0014
(1) 003104                      J0013:
003104  012737  003104  001106  R4013:  MOV     #R4013,$LPADR   ;INSURE A SHORT SCOPE LOOP
003112  005037  177546                  CLR     LKS
003116  005003                          CLR     R3              ;INITIALIZE A COUNTER LOCATION
(1) 003120  105737  177546      K0013:  TSTB    LKS             ;IS THE CLOCK FLAG SET?
(1) 003124  100404                      BMI     L0013           ;IF SO, CONTINUE ON WITH THE TEST
(1) 003126  005203                      INC     R3              ;IF NOT INCREMENT THE COUNTER LOCATION
(1) 003130  001373                      BNE     K0013           ;AND GO TEST THE CLOCK FLAG AGAIN. UNLESS...
```

```
003132  104001                    E30013: ERROR 1                       ;CLOCK FLAG DID NOT SET AFTER A WAITING PERIOD > 20 MS
003134  000425                            BR      T0014
003136                            L0013:
003136  012737  002724  001106            MOV     #R0013,$LPADR         ;MUST LOOP BACK TO BEGINING OF TEST IF EEROR COMES NOW
003144  005037  177546                    CLR     LKS
003150  105737  177546            M0013:  TSTB    LKS                   ;IS CLOCK FLAG SET
003154  100003                            BPL     N0013                 ;NO
003156  005202                            INC     R2                    ;+1 TO CLOCK COUNT
003160  005037  177546                    CLR     LKS                   ;CLEAR CLOCK IF SET
003164  005200                    N0013:  INC     R0                    ;+1 TO TIME COUNT
003166  001370                            BNE     M0013                 ;REPEAT UNTIL R0=0
003170  020102                            CMP     R1,R2                 ;IS 1ST CLOCK COUNT EQUAL TO 2ND CLOCK COUNT?
003172  001406                            BEQ     T0014                 ;YES
003174  010137  001156            E40013: MOV     R1,$REG1              ;GET R1 READY FOR PRINTOUT
003200  010237  001160                    MOV     R2,$REG2              ;GET R2 READY FOR PRINTOUT
003204  104004                            ERROR 4                       ;ERROR, CLOCK FLAG OCCURRED DIFFERENT
003206  000240                            NOP                           ;NUMBER OF TIMES IN EQUAL PERIODS



                                  .SBTTL  LINE CLOCK REGISTER ADDRESSING TEST
                                  ;LINE CLOCK REGISTER ADDRESSING TEST
                                  ;TEST THAT THE "LKS" REGISTER CAN NOT BE ADDRESSED AS ANYTHING BUT 177546
                                  ;SET A LOCATION THAT IS CLOSE(DIFFERS BY 1 BIT) TO THE LKS REGISTER
                                  ;TO 100. IF THE LKS ALSO CHANGES, THEN SIGNAL AN ERROR
003210  000004                    T0014:  SCOPE
003212  005037  001124                    CLR     $GDDAT
003216  012737  003254  001106            MOV     #R0014,$LPADR         ;INITIALIZE THE LOOPBACK ADDRESS IN CASE OF AN ERROR
003224  012737  157546  001120            MOV     #157546,$GDADR        ;SAME AS "LKS" ADDRESS EXCEPT WITH BIT 13 CLEAR
003232  012737  003272  000004            MOV     #A0014,4              ;SETUP VECTOR IN CASE IT IS NONEXISTANT
003240  012737  000340  000006            MOV     #340,6
003246  012737  000340  177776            MOV     #340,@#PS             ;NO INTERRUPTS NOW
003254  012706  001000            R0014:  MOV     #1000,SP              ;SETUP THE STACK
003260  005037  177546                    CLR     LKS
003264  012777  000100  175626    I0014:  MOV     #100,@$GDADR          ;SET THE "CLOSE" ADDRESS TO = 100
003272  032737  000100  177546    A0014:  BIT     #100,LKS              ;MAKE SURE THAT "LKS" WAS NOT AFFECTED
003300  001401                            BEQ     B0014
003302  104005                    E0014:  ERROR 5                       ;IT AFFECTED "LKS"  --  ERROR
003304  005037  177546            B0014:  CLR     LKS
003310  012737  003322  000004            MOV     #T0015  ,4
003316  005077  175576                    CLR     @$GDADR               ;CLEAR OUT THE "CLOSE" ADDRESS



                                  .SBTTL  LINE CLOCK REGISTER ADDRESSING TEST
                                  ;LINE CLOCK REGISTER ADDRESSING TEST
003322  000004                    T0015:  SCOPE
003324  012737  003404  000004            MOV     #A0015,4              ;SETUP VECTOR IN CASE IT IS NONEXISTANT
003332  012737  000340  000006            MOV     #340,6
003340  005037  001124                    CLR     $GDDAT
003344  012737  003366  001106            MOV     #R0015,$LPADR         ;INITIALIZE THE LOOPBACK ADDRESS IN CASE OF AN ERROR
003352  012737  177146  001120            MOV     #177146,$GDADR        ;SAME AS "LKS" ADDRESS EXCEPT WITH BIT 8 CLEAR
003360  012737  000340  177776            MOV     #340,@#PS             ;NO INTERRUPTS NOW
003366  012706  001000            R0015:  MOV     #1000,SP              ;SETUP THE STACK
```

```
                                                CLR     LKS
003376  012777  000100  175514  I0015:  MOV     #100,@$GDAOR    ;SET THE "CLOSE" ADDRESS TO = 100
003404  032737  000100  177546  A0015:  BIT     #100,LKS        ;MAKE SURE THAT "LKS" WAS NOT AFFECTED
003412  001401                          BEQ     B0015
003414  104005                  E0015:  ERROR 5                 ;IT AFFECTED "LKS"  --  ERROR
003416  005037  177546          B0015:  CLR     LKS
003422  012737  003434  000004          MOV     #T0016  ,4
003430  005077  175464                  CLR     @$GDAOR         ;CLEAR OUT THE "CLOSE" ADDRESS
```

```
                        .SBTTL  LINE CLOCK REGISTER ADDRESSING TEST
                        ;LINE CLOCK REGISTER ADDRESSING TEST
003434  000004          T0016:  SCOPE
003436  012737  003516  000004          MOV     #A0016,4        ;SETUP VECTOR IN CASE IT IS NONEXISTANT
003444  012737  000340  000006          MOV     #340,6
003452  005037  001124                  CLR     $GDOAT
003456  012737  003500  001106          MOV     #R0016,$LPADR   ;INITIALIZE THE LOOPBACK ADDRESS IN CASE OF AN ERROR
003464  012737  177446  001120          MOV     #177446,$GDAOR  ;SAME AS "LKS" ADDRESS EXCEPT WITH BIT 6 CLEAR
003472  012737  000340  177776          MOV     #340,@#PS       ;NO INTERRUPTS NOW
003500  012706  001000          R0016:  MOV     #1000,SP        ;SETUP THE STACK
003504  005037  177546                  CLR     LKS
003510  012777  000100  175402  I0016:  MOV     #100,@$GDAOR    ;SET THE "CLOSE" ADDRESS TO = 100
003516  032737  000100  177546  A0016:  BIT     #100,LKS        ;MAKE SURE THAT "LKS" WAS NOT AFFECTED
003524  001401                          BEQ     B0016
003526  104005                  E0016:  ERROR 5                 ;IT AFFECTED "LKS"  --  ERROR
003530  005037  177546          B0016:  CLR     LKS
003534  012737  003546  000004          MOV     #T0017  ,4
003542  005077  175352                  CLR     @$GDAOR         ;CLEAR OUT THE "CLOSE" ADDRESS
```

```
                        .SBTTL  LINE CLOCK REGISTER ADDRESSING TEST
                        ;LINE CLOCK REGISTER ADDRESSING TEST
003546  000004          T0017:  SCOPE
003550  012737  003630  000004          MOV     #A0017,4        ;SETUP VECTOR IN CASE IT IS NONEXISTANT
003556  012737  000340  000006          MOV     #340,6
003564  005037  001124                  CLR     $GDOAT
003570  012737  003612  001106          MOV     #R0017,$LPADR   ;INITIALIZE THE LOOPBACK ADDRESS IN CASE OF AN ERROR
003576  012737  177556  001120          MOV     #177556,$GDAOR  ;SAME AS "LKS" ADDRESS EXCEPT WITH BIT 3 SET
003604  012737  000340  177776          MOV     #340,@#PS       ;NO INTERRUPTS NOW
003612  012706  001000          R0017:  MOV     #1000,SP        ;SETUP THE STACK
003616  005037  177546                  CLR     LKS
003622  012777  000100  175270  I0017:  MOV     #100,@$GDAOR    ;SET THE "CLOSE" ADDRESS TO = 100
003630  032737  000100  177546  A0017:  BIT     #100,LKS        ;MAKE SURE THAT "LKS" WAS NOT AFFECTED
003636  001401                          BEQ     B0017
003640  104005                  E0017:  ERROR 5                 ;IT AFFECTED "LKS"  --  ERROR
003642  005037  177546          B0017:  CLR     LKS
003646  012737  003660  000004          MOV     #T0020  ,4
003654  005077  175240                  CLR     @$GDAOR         ;CLEAR OUT THE "CLOSE" ADDRESS
```

```
                        .SBTTL  LINE CLOCK REGISTER ADDRESSING TEST
```

```
                                                ;LINE CLOCK REGISTER ADDRESSING TEST
003660  000004                          T0020:  SCOPE
003662  012737  003742  000004                  MOV     #A0020,4        ;SETUP VECTOR IN CASE IT IS NONEXISTANT
003670  012737  000340  000006                  MOV     #340,6
003676  005037  001124                          CLR     $GDDAT
003702  012737  003724  001106                  MOV     #R0020,$LPADR   ;INITIALIZE THE LOOPBACK ADDRESS IN CASE OF AN ERROR
003710  012737  177566  001120                  MOV     #177566,$GDADR  ;SAME AS "LKS" ADDRESS EXCEPT WITH BIT 4 SET
003716  012737  000340  177776                  MOV     #340,@#PS       ;NO INTERRUPTS NOW
003724  012706  001000                  R0020:  MOV     #1000,SP        ;SETUP THE STACK
003730  005037  177546                          CLR     LKS
003734  012777  000100  175156          I0020:  MOV     #100,@$GDADR    ;SET THE "CLOSE" ADDRESS TO = 100
003742  032737  000100  177546          A0020:  BIT     #100,LKS        ;MAKE SURE THAT "LKS" WAS NOT AFFECTED
003750  001401                                  BEQ     B0020
003752  104005                          E0020:  ERROR 5                 ;IT AFFECTED "LKS"  --  ERROR
003754  005037  177546                  B0020:  CLR     LKS
003760  012737  003772  000004                  MOV     #T0021  ,4
003766  005077  175126                          CLR     @$GDADR         ;CLEAR OUT THE "CLOSE" ADDRESS
                                                .SBTTL  LINE CLOCK REGISTER ADDRESSING TEST
                                                ;LINE CLOCK REGISTER ADDRESSING TEST
003772  000004                          T0021:  SCOPE
003774  012737  004054  000004                  MOV     #A0021,4        ;SETUP VECTOR IN CASE IT IS NONEXISTANT
004002  012737  000340  000006                  MOV     #340,6
004010  005037  001124                          CLR     $GDDAT
004014  012737  004036  001106                  MOV     #R0021,$LPADR   ;INITIALIZE THE LOOPBACK ADDRESS IN CASE OF AN ERROR
004022  012737  177746  001120                  MOV     #177746,$GDADR  ;SAME AS "LKS" ADDRESS EXCEPT WITH BIT 7 SET
004030  012737  000340  177776                  MOV     #340,@#PS       ;NO INTERRUPTS NOW
004036  012706  001000                  R0021:  MOV     #1000,SP        ;SETUP THE STACK
004042  005037  177546                          CLR     LKS
004046  012777  000100  175044          I0021:  MOV     #100,@$GDADR    ;SET THE "CLOSE" ADDRESS TO = 100
004054  032737  000100  177546          A0021:  BIT     #100,LKS        ;MAKE SURE THAT "LKS" WAS NOT AFFECTED
004062  001401                                  BEQ     B0021
004064  104005                          E0021:  ERROR 5                 ;IT AFFECTED "LKS"  --  ERROR
004066  005037  177546                  B0021:  CLR     LKS
004072  012737  004104  000004                  MOV     #T0022  ,4
004100  005077  175014                          CLR     @$GDADR         ;CLEAR OUT THE "CLOSE" ADDRESS
                                                .SBTTL  LINE CLOCK REGISTER HIGH BYTE TEST
                                                ;LINE CLOCK REGISTER HIGH BYTE TEST
                                                ;MAKE SURE THE LKS REGISTER LOW BYTE RESPONDS TO THE HIGH BYTES ADDRESS
004104  000004                          T0022:  SCOPE
004106  012737  005674  000004                  MOV     #TRAP0,@#4      ;SETUP VECOR IN CASE OF UNFORSEEN PROBLEMS
(1) 004114  012737  000340  000006              MOV     #340,@#6        ;NO INTERRUPTS WHILE PRINTING FATAL MESSAGE
004122  012737  000100  001124                  MOV     #100,$GDDAT
004130  012737  004152  001106                  MOV     #R0022,$LPADR   ;INITIALIZE THE LOOPBACK ADDRESS IN CASE OF AN ERROR
004136  012737  177547  001120                  MOV     #177547,$GDADR  ;HIGH BYTE OF THE LKS REGISTER
004144  012737  000340  177776                  MOV     #340,@#PS       ;NO INTERRUPTS NOW
004152  012706  001000                  R0022:  MOV     #1000,SP        ;SETUP THE STACK
004156  005037  177546                          CLR     LKS
004162  112777  000100  174730          I0022:  MOVB    #100,@$GDADR    ;SET THE HIGH BYTE ADDRESS TO = 100
```

```
                                                .SBTTL  CLOCK FLAG BIT TEST
                                                ;CLOCK FLAG BIT TEST
004210  000004                          T0023:  SCOPE
004212  012737  005674  000004                  MOV     #TRAP0,@#4      ;SETUP VECOR IN CASE OF UNFORSEEN PROBLEMS
(1)     004220  012737  000340  000006          MOV     #340,@#6        ;NO INTERRUPTS WHILE PRINTING FATAL MESSAGE
004226  012737  000200  001124                  MOV     #200,$GDDAT
004234  012737  004242  001106                  MOV     #R0023,$LPADR   ;INITIALIZE THE LOOPBACK ADDRESS IN CASE OF AN ERROR
004242  005037  177546                  R0023:  CLR     LKS
004246  005003                                  CLR     R3              ;INITIALIZE A COUNTER LOCATION
(1)     004250  105737  177546          A0023:  TSTB    LKS             ;IS THE CLOCK FLAG SET?
(1)     004254  100404                          BMI     B0023           ;IF SO, CONTINUE ON WITH THE TEST
(1)     004256  005203                          INC     R3              ;IF NOT INCREMENT THE COUNTER LOCATION
(1)     004260  001373                          BNE     A0023           ;AND GO TEST THE CLOCK FLAG AGAIN. UNLESS...
(1)     004262  104001                  E0023:  ERROR 1                 ;CLOCK FLAG DID NOT SET AFTER A WAITING PERIOD > 20 MS
(1)     004264  000410                          BR      T0024
(1)     004266                          B0023:
004266  012737  000200  177546  I0023:  MOV     #200,LKS        ;MOVE A 1 INTO THE CLOCK FLAG BIT
004274  023737  177546  001124          CMP     LKS,$GDDAT      ;SHOULD NOT AFFECT THE FLAG BIT
004302  001401                          BEQ     T0024
004304  104001                  E10023: ERROR 1                 ;CLOCK FLAG DID NOT CLEAR


                                                .SBTTL  INTERRUPT TEST
004306  000004                          T0024:  SCOPE
004310  012737  005674  000004                  MOV     #TRAP0,@#4      ;SETUP VECOR IN CASE OF UNFORSEEN PROBLEMS
(1)     004316  012737  000340  000006          MOV     #340,@#6        ;NO INTERRUPTS WHILE PRINTING FATAL MESSAGE
004324  012737  000200  001124                  MOV     #200,$GDDAT     ;HAVE GOOD DATA INFO READY FOR TYPEOUT IN CASE OF AN ERR
004332  012737  004352  001106                  MOV     #R0024,$LPADR   ;INITIALIZE THE LOOPBACK ADDRESS IN CASE OF AN ERROR
004340  012737  004406  000100                  MOV     #E0024,100
004346  005037  177546                          CLR     LKS             ;ALLOW CLOCK INTERRUPTS
004352  012737  000340  177776  R0024:  MOV     #340,@#PS       ;NO INTERRUPTS NOW
004360  012737  000300  177546                  MOV     #300,LKS
004366  005227  000000                  A0024:  INC     #0              ;WAIT FOR 20+ MS
004372  001375                          BNE     A0024           ;LOOP BACK IF NOT DONE WAITING
004374  000005                          RESET                   ;RESET SHOULD CLEAR INTERRUPT ENABLE
004376  023737  001124  177546          CMP     $GDDAT,LKS      ;AND LEAVE THE CLOCK FLAG SET
004404  001401                          BEQ     T0025           ;GO ON TO THE NEXT TEST IF IT DID
004406  104001                  E0024:  ERROR 1                 ;RESET SET INTERRUPT ENABLE OR CLEARED CLOCK FLAG


                                                .SBTTL  NO SACK TIMEOUT TEST
                                                ;NO SACK TIMEOUT TEST
004410  000004                          T0025:  SCOPE
004412  012737  005674  000004                  MOV     #TRAP0,@#4      ;SETUP VECOR IN CASE OF UNFORSEEN PROBLEMS
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(1)  004420  012737  000340  000006          MOV     #340,@#6        ;NO INTERRUPTS WHILE PRINTING FATAL MESSAGE
507  004426  012737  000300  001124          MOV     #300,$GDDAT     ;HAVE GOOD DATA INFO READY FOR TYPEOUT IN CASE OF AN ERR
508  004434  012737  004456  001106          MOV     #R0025,$LPADR   ;INITIALIZE THE LOOPBACK ADDRESS IN CASE OF AN ERROR
509  004442  012737  000340  000102          MOV     #340,102        ;NO INTERRUPTS AFTER THE FIRST ONE
510  004450  012737  004530  000100          MOV     #C0025,100
511  004456  005037  177546          R0025:  CLR     LKS
512  004462  012737  000360  177776          MOV     #360,PS
513  004470  005003                          CLR     R3              ;INITIALIZE A COUNTER LOCATION
(1)  004472  105737  177546          A0025:  TSTB    LKS             ;IS THE CLOCK FLAG SET?
(1)  004476  100404                          BMI     B0025           ;IF SO, CONTINUE ON WITH THE TEST
(1)  004500  005203                          INC     R3              ;IF NOT INCREMENT THE COUNTER LOCATION
(1)  004502  001373                          BNE     A0025           ;AND GO TEST THE CLOCK FLAG AGAIN. UNLESS...
(1)  004504  104001          E0025:  ERROR 1                         ;CLOCK FLAG DID NOT SET AFTER A WAITING PERIOD > 20 MS
(1)  004506  000415                          BR      T0026
(1)  004510                  B0025:
514  004510  005037  177776                 CLR     PS              ;MAKE ALL INTERRUPTS OK
515  004514  012737  000100  177546          MOV     #100,LKS        ;ENABLE CLOCK INTERRUPTS
516  004522  000001                          WAIT                    ;THE ONLY WAY TO LEAVE HERE WITHOUT ERROR IS TO INTERRUP
517  004524  104006          E1002S: ERROR 6                         ;IF IT ERROR IS HERE ITS BECAUSE OF A "NO-SACK" TIMEOUT
518  004526  000405                          BR      T0026
519  004530  022737  000300  177546  C0025:  CMP     #300,LKS
520  004536  001401                          BEQ     T0026           ;FIND OUT WHAT THE INTERRUPT DID TO THE CLOCK STATUS REG
521  004540  104001          E2002S: ERROR 1                         ;IT CLEARED THE INTERRUPT ENABLE OR THE FLAG BIT
522
523
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525                                  .SBTTL  RESET TEST
526                                  ;RESET TEST
527  004542  000004          T0026:  SCOPE
528  004544  012737  005674  000004          MOV     #TRAP0,@#4      ;SETUP VECOR IN CASE OF UNFORSEEN PROBLEMS
(1)  004552  012737  000340  000006          MOV     #340,@#6        ;NO INTERRUPTS WHILE PRINTING FATAL MESSAGE
529  004560  012737  000200  001124          MOV     #200,$GDDAT     ;HAVE GOOD DATA INFO READY FOR TYPEOUT IN CASE OF AN ERR
530  004566  012737  004616  001106          MOV     #R0026,$LPADR   ;INITIALIZE THE LOOPBACK ADDRESS IN CASE OF AN ERROR
531  004574  012737  000340  177776          MOV     #340,@#PS       ;NO INTERRUPTS NOW
532  004602  012737  004654  000100          MOV     #E0026,100
533  004610  012737  000140  000102          MOV     #140,102        ;SETUP STATUS FOR AFTER THE INTERRUPT
534  004616  005037  177546          R0026:  CLR     LKS
535  004622  012706  001000                  MOV     #1000,SP        ;SETUP THE STACK
536  004626  012737  000100  177546          MOV     #100,LKS        ;SET INTERRUPT ENABLE BIT NOW
537  004634  005227  000000          A0026:  INC     #0              ;WAIT FOR CLOCK FLAG TO SET
538  004640  001375                          BNE     A0026
539  004642  000005          I0026:  RESET                           ;RESET SHOULD NOT CLEAR THE FLAG
540  004644  023737  177546  001124          CMP     LKS,$GDDAT      ;FIND OUT IF ID DIT DID OR NOT
541  004652  001401                          BEQ     T0027
542  004654  104001          E0026:  ERROR 1                         ;RESET DID NOT INITIALIZE THE LKS WORD CORRECTLY
543
544
545
546                                  .SBTTL  CLOCK FLAG BIT TEST
547                                  ;CLOCK FLAG BIT TEST
548                                  ;MAKE SURE IT DOESNT CLEAR WHEN YOU TRY TO SET IT VIA A 'MOV' INSTRUCTION
549  004656  000004          T0027:  SCOPE
550  004660  012737  005674  000004          MOV     #TRAP0,@#4      ;SETUP VECOR IN CASE OF UNFORSEEN PROBLEMS
(1)  004666  012737  000340  000006          MOV     #340,@#6        ;NO INTERRUPTS WHILE PRINTING FATAL MESSAGE
```

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    004674 012737 000200 001124          MOV    #200,$GDDAT      ;HAVE GOOD DATA INFO READY FOR TYPEOUT IN CASE OF AN ERR
    004702 012737 004722 001106          MOV    #R0027,$LPADR    ;INITIALIZE THE LOOPBACK ADDRESS IN CASE OF AN ERROR
    004710 005037 000102                 CLR    102
    004714 012737 005000 000100          MOV    #T0030  ,100
    004722 005037 177546         R0027:  CLR    LKS
    004726 012737 000340 177776          MOV    #340,PS
    004734 012706 001000                 MOV    #1000,SP         ;SETUP THE STACK
    004740 005037 001230                 CLR    WORD             ;SETUP A COUNTER LOCATION TO = 0
    004744 005237 001230         A0027:  INC    WORD
    004750 001375                        BNE    A0027            ;WASTE TIME LOOPING UNTIL THE COUNTER REACHES 0
    004752 012737 000300 177546          MOV    #300,LKS         ;SET INTERRUPT ENABLE AND TRY TO SET THE CLOCK FLAG
    004760 012737 000200 177546          MOV    #200,LKS         ;TRY TO SET IT AGAIN
    004766 023737 177546 001124          CMP    LKS,$GDDAT       ;DID THE CLOCK FLAG STAY SET?
    004774 001401                        BEQ    T0030            ;IF NOT GO ON TO THE NEXT TEST
    004776 104001                E0027:  ERROR 1                 ;ERROR - MOVED A '1' INTO THE CLOCK FLAG BIT AND IT STAY



                                 .SBTTL  CLOCK FLAG AFTER INTERRUPT TEST
                                 ;SEE IF AN INTERRUPT CLEARS THE CLOCK FLAG
    005000 000004                T0030:  SCOPE
    005002 012737 005674 000004          MOV    #TRAP0,@#4       ;SETUP VECOR IN CASE OF UNFORSEEN PROBLEMS
(1) 005010 012737 000340 000006          MOV    #340,@#6         ;NO INTERRUPTS WHILE PRINTING FATAL MESSAGE
    005016 005037 177546                 CLR    LKS              ;NO CLOCK INTERRUPTS BEFORE WE ARE READY
    005022 012737 000100 001124          MOV    #100,$GDDAT      ;HAVE GOOD DATA INFO READY FOR TYPEOUT IN CASE OF AN ERR
    005030 012737 005036 001106          MOV    #R0030,$LPADR    ;INITIALIZE THE LOOPBACK ADDRESS IN CASE OF AN ERROR
    005036 012737 005100 000100  R0030:  MOV    #A0030,100       ;SETUP CLOCK INTERRUPT VECTOR
    005044 005037 000102                 CLR    102              ;PRIORITY LEVEL WILL ALLOW FURTHER INTERRUPTS
    005050 005037 177776                 CLR    PS
    005054 012706 001000                 MOV    #1000,SP         ;SETUP THE STACK
    005060 005037 177546                 CLR    LKS
    005064 105037 001230                 CLRB   WORD             ;CLEAR OUT A COUNTER LOCATION
    005070 012737 000100 177546          MOV    #100,LKS         ;ENABLE CLOCK INTERRUPTS NOW
    005076 000001                        WAIT                    ;WAIT FOR AN INTERRUPT
    005100 012737 005126 000100  A0030:  MOV    #E0030,100       ;ERROR IF WE INTERRUPT AGAIN
    005106 005037 177776                 CLR    PS               ;LET INTERRUPTS HAPPEN NOW
    005112 105237 001230         B0030:  INCB   WORD             ;DO A NOTHING LOOP FOR A VERY SHORT PERIOD OF TIME
    005116 001375                        BNE    B0030            ;WE SHOULD INCREMENT TO 0 LONG BEFORE AN INTERRUPT COMES
    005120 005037 177546                 CLR    LKS
    005124 000401                        BR     T0031
    005126 104001                E0030:  ERROR 1                 ;INTERRUPT DID NOT CLEAR THE CLOCK FLAG



                                 .SBTTL  NO INTERRUT AT PRIORITY 7 TEST
                                 ;TEST THAT CLOCK WILL NOT INTERRUPT WITH PROCESSR AT PRIORITY 7
    005130 000004                T0031:  SCOPE
    005132 012737 005674 000004          MOV    #TRAP0,@#4       ;SETUP VECOR IN CASE OF UNFORSEEN PROBLEMS
(1) 005140 012737 000340 000006          MOV    #340,@#6         ;NO INTERRUPTS WHILE PRINTING FATAL MESSAGE
    005146 012737 005154 001106          MOV    #R0031,$LPADR    ;SETUP LOOPBACK ADDRESS IN CASE OF AN ERROR
    005154 005037 177546         R0031:  CLR    LKS
    005160 005003                        CLR    R3               ;INITIALIZE A COUNTER LOCATION
(1) 005162 105737 177546         A0031:  TSTB   LKS              ;IS THE CLOCK FLAG SET?
(1) 005166 100404                        BMI    B0031            ;IF SO, CONTINUE ON WITH THE TEST
```

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(1)  005170  005203                          INC     R3              ;IF NOT INCREMENT THE COUNTER LOCATION
(1)  005172  001373                          BNE     A0031           ;AND GO TEST THE CLOCK FLAG AGAIN. UNLESS...
(1)  005174  104001                E0031:    ERROR 1                 ;CLOCK FLAG DID NOT SET AFTER A WAITING PERIOD > 20 MS
(1)  005176  000427                          BR      T0032
(1)  005200                        B0031:
601  005200  012706  001000                 MOV     #1000,SP        ;INITIALIZE THE STACK POINTER
602  005204  012737  000340  177776         MOV     #340,PS         ;SET PRIORITY 7
603  005212  012737  005174  000100         MOV     #E0031,100      ;SET UP VECTOR RETURN
604  005220  012737  000100  177546         MOV     #100,LKS        ;ENABLE INTERRUPT
605  005226  005003                          CLR     R3              ;INITIALIZE A COUNTER LOCATION
(1)  005230  105737  177546        C0031:    TSTB    LKS             ;IS THE CLOCK FLAG SET?
(1)  005234  100404                          BMI     D0031           ;IF SO, CONTINUE ON WITH THE TEST
(1)  005236  005203                          INC     R3              ;IF NOT INCREMENT THE COUNTER LOCATION
(1)  005240  001373                          BNE     C0031           ;AND GO TEST THE CLOCK FLAG AGAIN. UNLESS...
(1)  005242  104001                E1O031:   ERROR 1                 ;CLOCK FLAG DID NOT SET AFTER A WAITING PERIOD > 20 MS
(1)  005244  000404                          BR      T0032
(1)  005246                        D0031:
606  005246  000240                          NOP
607  005250  000240                          NOP                     ;GIVE CLOCK EXTRA TIME TO INTERRUPT
608  005252  000401                          BR      T0032
609  005254  104003                E20031:   ERROR 3                 ;ERROR, CLOCK INTERRUPTED WITHOUT HAVING PRIORITY
610
611
612
613                                .SBTTL  CC PUSH TEST FOR CLOCK INTERRUPTS
614                                ;TEST THAT CLOCK INTERRUPT PUSHES CONDITION CODES ONTO STACK
615  005256  000004                T0032:    SCOPE
616  005260  012737  005674  000004         MOV     #TRAP0,@#4      ;SETUP VECOR IN CASE OF UNFORSEEN PROBLEMS
(1)  005266  012737  000340  000006         MOV     #340,@#6        ;NO INTERRUPTS WHILE PRINTING FATAL MESSAGE
617  005274  012737  005302  001106         MOV     #R0032,$LPADR   ;SETUP LOOPBACK ADDRESS IN CASE OF AN ERROR
618  005302  005037  177546        R0032:    CLR     LKS
619  005306  005003                          CLR     R3              ;INITIALIZE A COUNTER LOCATION
(1)  005310  105737  177546        A0032:    TSTB    LKS             ;IS THE CLOCK FLAG SET?
(1)  005314  100404                          BMI     B0032           ;IF SO, CONTINUE ON WITH THE TEST
(1)  005316  005203                          INC     R3              ;IF NOT INCREMENT THE COUNTER LOCATION
(1)  005320  001373                          BNE     A0032           ;AND GO TEST THE CLOCK FLAG AGAIN. UNLESS...
(1)  005322  104001                E0032:    ERROR 1                 ;CLOCK FLAG DID NOT SET AFTER A WAITING PERIOD > 20 MS
(1)  005324  000432                          BR      T0033
(1)  005326                        B0032:
620  005326  012706  001000                 MOV     #1000,SP        ;INITIALIZE THE STACK POINTER
621  005332  005037  000776                 CLR     BUF1
622  005336  005037  000774                 CLR     BUF2
623  005342  012737  005370  000100         MOV     #C0032,100      ;SET UP VECTOR RETURN
624  005350  012737  000100  177546         MOV     #100,LKS        ;ENABLE INTERRUPT
625  005356  012737  000200  177776         MOV     #200,PS         ;SET PRIORITY 4
626  005364  000277                          +SEC!SEV!SEZ!SEN        ;SET ALL CONDITION CODES
627  005366  000001                          WAIT                    ;WAIT FOR INTERRUPT
628  005370  022737  000217  000776 C0032:   CMP     #217,BUF1
629  005376  001405                          BEQ     T0033
630  005400  012737  000017  001124         MOV     #17,$GDDAT
631  005406  104007                          ERROR 7                 ;ERROR DID NOT PUSH CORRECT PS ONTO STACK
632  005410  000722                          BR      T0032
633
634
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                                        .SBTTL  PC PUSH TEST FOR CLOCK INTERRUPTS
                                        ;TEST THAT CLOCK INTERRUPT PUSHES THE PROGRAM COUNTER ONTO STACK
005412  000004                  T0033:  SCOPE
005414  012737  005674  000004          MOV     #TRAP0,@#4      ;SETUP VECOR IN CASE OF UNFORSEEN PROBLEMS
(1) 005422  012737  000340  000006      MOV     #340,@#6        ;NO INTERRUPTS WHILE PRINTING FATAL MESSAGE
005430  012737  005436  001106          MOV     #R0033,$LPADR   ;SETUP LOOPBACK ADDRESS IN CASE OF AN ERROR
005436  005037  177546          R0033:  CLR     LKS
005442  005003                          CLR     R3              ;INITIALIZE A COUNTER LOCATION
(1) 005444  105737  177546      A0033:  TSTB    LKS             ;IS THE CLOCK FLAG SET?
(1) 005450  100404                      BMI     B0033           ;IF SO, CONTINUE ON WITH THE TEST
(1) 005452  005203                      INC     R3              ;IF NOT INCREMENT THE COUNTER LOCATION
(1) 005454  001373                      BNE     A0033           ;AND GO TEST THE CLOCK FLAG AGAIN. UNLESS...
(1) 005456  104001              E0033:  ERROR 1                 ;CLOCK FLAG DID NOT SET AFTER A WAITING PERIOD > 20 MS
(1) 005460  000431                      BR      T0034
(1) 005462                      B0033:
005462  012706  001000                  MOV     #1000,SP        ;INITIALIZE THE STACK POINTER
005466  005037  000776                  CLR     BUF1
005472  005037  000774                  CLR     BUF2
005476  012737  005524  000100          MOV     #C0033,100      ;SET UP VECTOR RETURN
005504  012737  000100  177546          MOV     #100,LKS        ;ENABLE INTERRUPT
005512  012737  000200  177776          MOV     #200,PS         ;SET PRIORITY 4
005520  000277                          +SEC!SEV!SEZ!SEN        ;SET ALL CONDITION CODES
005522  000001                          WAIT                    ;WAIT FOR INTERRUPT
005524  022737  005524  000774  C0033:  CMP     #C0033,BUF2
005532  001404                          BEQ     T0034
005534  012737  005524  001124  E10033: MOV     #C0033,$GDDAT
005542  104010                          ERROR 10                ;ERROR, DID NOT PUSH CORRECT PC ONTO STACK


                                        .SBTTL  END OF PASS INDICATING
005544  000004                  T0034:  SCOPE
005546  005037  177546                  CLR     LKS             ;TURN THE CLOCK OFF
005552  000005                          RESET                   ;TURN EVERYTHING OFF

                                        ;;**************************************************************
(1)
(1)                                     .SBTTL  END OF PASS ROUTINE
(1)
(1)                                     ;*INCREMENT THE PASS NUMBER ($PASS)
(1)                                     ;*TYPE "END PASS #XXXXX" (WHERE XXXXX IS A DECIMAL NUMBER)
(1)                                     ;*IF THERES A MONITOR GO TO IT
(1)                                     ;*IF THERE ISN'T JUMP TO T0001
(1)
(1) 005554                      $EOP:
(1) 005554  000004                      SCOPE
(1) 005556  005037  001102              CLR     $TSTNM          ;ZERO THE TEST NUMBER
(1) 005562  005037  001214              CLR     $TIMES          ;ZERO THE NUMBER OF ITERATIONS
(1) 005566  005237  001100              INC     $PASS           ;INCREMENT THE PASS NUMBER
(1) 005572  042737  100000  001100      BIC     #100000,$PASS   ;DON'T ALLOW A NEG. NUMBER
(1) 005600  005327                      DEC     (PC)+           ;LOOP?
(1) 005602  000001              $EOPCT: .WORD   1
(1) 005604  003021                      BGT     $DOAGN          ;YES
```

```
(1)  005606  012737                          MOV     (PC)+,@(PC)+            ;RESTORE COUNTER
(1)  005610  000001                  $ENDCT: .WORD   1
(1)  005612  005602                          $EOPCT
(1)  005614  104400  005654                  TYPE    ,$ENDMG                 ;TYPE "END PASS #"
(2)  005620  013746  001100                  MOV     $PASS,-(SP)             ;SAVE $PASS FOR TYPEOUT
(2)  005624  104410                          TYPOS                           ;GO TYPE--DECIMAL ASCII WITH SIGN
(1)  005626  104400  005671                  TYPE    ,$ENULL                 ;TYPE A NULL CHARACTER
(1)  005632  013700  000042          $GET42: MOV     @#42,R0                 ;GET MONITOR ADDRESS
(1)  005636  001404                          BEQ     $DOAGN                  ;IF NONE
(1)  005640  004710                  $ENDAD: JSR     PC,(R0)                 ;GO TO MONITOR
(1)  005642  000240                          NOP                             ;SAVE ROOM
(1)  005644  000240                          NOP                             ;FOR
(1)  005646  000240                          NOP                             ;ACT11
(1)  005650  000137  001550          $DOAGN: JMP     @#T0001                 ;RETURN
(1)  005654  005015  047105  020104  $ENDMG: .ASCIZ   <15><12>/END PASS #/
(1)  005662  040520  051523  021440
(1)  005670     000
(1)  005671     377     377     000  $ENULL: .BYTE   -1,-1,0                 ;NULL CHARACTER STRING
664  005674  005046                  TRAP0:  CLR     -(SP)
665  005676  004737  006216                  JSR     PC,$TYPE        ;PRINTOUT"TRAPPED TO 4 FROM "
666  005702  007661                          TRPMES                  ;ADDRESS OF THE MESSAGE
667  005704  011646                          MOV     (SP),-(SP)      ;GET THE ADDRESS WHERE THE TRAP OCCURED
668  005706  162716  000002                  SUB     #2,(SP)         ;MAKE IT RIGHT
669  005712  104402                          TYPOC                   ;TYPE OUT ADDRESS IN OCTAL
670  005714  104400  001225                  TYPE    ,$CRLF          ;PRINTOUT A CARRIAGE RETURN-LINE FEED
671  005720  005046                          CLR     -(SP)
672  005722  004737  006216                  JSR     PC,$TYPE        ;PRINTOUT RESTARTING MESSAGE
673  005726  007722                          TRPM2S                  ;ADDRESS OF RESTART MESSAGE
674  005730  000240                          NOP
675  005732  000240                          NOP
676  005734  000240                          NOP
677  005736  000240                          NOP
678  005740  000005                          RESET
679  005742  000137  001416                  JMP     START
680                          ;;*****************************************************************
(1)
(1)                          .SBTTL  SCOPE HANDLER ROUTINE
(1)
(1)                          ;*SW14=1        LOOP ON TEST
(1)                          ;*SW11=1        INHIBIT ITERATIONS
(1)                          ;*SW09=1        LOOP ON ERROR
(1)                          ;*SW08=1        LOOP ON TEST IN SWR<7:0>
(1)                          ;*THE TEST NUMBER ($TSTNM) IS INCREMENTED AND DISPLAYED IN DISPLAY<7:0>
(1)                          ;*AND THE ERROR FLAG ($ERFLG) IS DISPLAYED IN DISPLAY<15:08>
(1)
(1)  005746                  $SCOPE:
(2)  005746  000240                  NOP
(1)  005750  006137  177570          ROL     @#SWR                   ;LOOP ON PRESENT TEST?
(1)  005754  100511                  BMI     $OVER                   ;YES IF SW14=1
(1)                          ;*****START OF CODE FOR THE XOR TESTER*****
(1)  005756  000416          $XTSTR: BR      6$                      ;IF RUNNING ON THE "XOR" TESTER CHANGE
(1)                                                                  ;THIS INSTRUCTION TO A "NOP" (NOP=240)
(1)  005760  013746  000004          MOV     @#ERRVEC,-(SP)          ;SAVE THE CONTENTS OF THE ERROR VECTOR
(1)  005764  012737  006004  000004  MOV     #5$,@#ERRVEC            ;SET FOR TIMEOUT
```

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(1)  005772  005737  177060            TST     @#177060                ;TIME OUT ON XOR?
(1)  005776  012637  000004            MOV     (SP)+,@#ERRVEC          ;RESTORE THE ERROR VECTOR
(1)  006002  000463                    BR      $SVLAD                  ;GO TO THE NEXT TEST
(1)  006004  022626              5$:   CMP     (SP)+,(SP)+             ;CLEAR THE STACK AFTER A TIME OUT
(1)  006006  012637  000004            MOV     (SP)+,@#ERRVEC          ;RESTORE THE ERROR VECTOR
(1)  006012  000423                    BR      7$                      ;LOOP ON THE PRESENT TEST
(1)  006014                      6$:   ;#####END OF CODE FOR THE XOR TESTER#####
(1)  006014  032737  000400  177570    BIT     #SW08,@#SWR             ;LOOP ON SPEC. TEST?
(1)  006022  001404                    BEQ     2$                      ;BR IF NO
(1)  006024  123737  177570  001102    CMPB    @#SWR,$TSTNM            ;ON THE RIGHT TEST?     SWR<7:0>
(1)  006032  001462                    BEQ     $OVER                   ;BR IF YES
(1)  006034  105737  001103      2$:   TSTB    $ERFLG                  ;HAS AN ERROR OCCURRED?
(1)  006040  001421                    BEQ     3$                      ;BR IF NO
(1)  006042  123737  001115  001103    CMPB    $ERMAX,$ERFLG           ;MAX. ERRORS FOR THIS TEST OCCURRED?
(1)  006050  101015                    BHI     3$                      ;BR IF NO
(1)  006052  032737  001000  177570    BIT     #SW09,@#SWR             ;LOOP ON ERROR?
(1)  006060  001404                    BEQ     4$                      ;BR IF NO
(1)  006062  013737  001110  001106  7$:   MOV     $LPERR,$LPADR           ;SET LOOP ADDRESS TO LAST SCOPE
(1)  006070  000443                    BR      $OVER
(1)  006072  105037  001103      4$:   CLRB    $ERFLG                  ;ZERO THE ERROR FLAG
(1)  006076  005037  001214            CLR     $TIMES                  ;CLEAR THE NUMBER OF ITERATIONS TO MAKE
(1)  006102  000415                    BR      1$                      ;ESCAPE TO THE NEXT TEST
(1)  006104  032737  004000  177570  3$:   BIT     #SW11,@#SWR             ;INHIBIT ITERATIONS?
(1)  006112  001011                    BNE     1$                      ;BR IF YES
(1)  006114  005737  001100            TST     $PASS                   ;IF FIRST PASS OF PROGRAM
(1)  006120  001406                    BEQ     1$                      ;       INHIBIT ITERATIONS
(1)  006122  005237  001104            INC     $ICNT                   ;INCREMENT ITERATION COUNT
(1)  006126  023737  001214  001104    CMP     $TIMES,$ICNT            ;CHECK THE NUMBER OF ITERATIONS MADE
(1)  006134  002021                    BGE     $OVER                   ;BR IF MORE ITERATION REQUIRED
(1)  006136  012737  000001  001104  1$:   MOV     #1,$ICNT                ;REINITIALIZE THE ITERATION COUNTER
(1)  006144  013737  006214  001214        MOV     $MXCNT,$TIMES           ;SET NUMBER OF ITERATIONS TO DO
(1)  006152  105237  001102      $SVLAD: INCB    $TSTNM                  ;COUNT TEST NUMBERS
(1)  006156  011637  001106              MOV     (SP),$LPADR             ;SAVE SCOPE LOOP ADDRESS
(1)  006162  011637  001110              MOV     (SP),$LPERR             ;SAVE ERROR LOOP ADDRESS
(1)  006166  005037  001216              CLR     $ESCAPE                 ;CLEAR THE ESCAPE FROM ERROR ADDRESS
(1)  006172  112737  000001  001115      MOVB    #1,$ERMAX               ;ONLY ALLOW ONE(1) ERROR ON NEXT TEST
(1)  006200  013737  001102  177570  $OVER:  MOV     $TSTNM,@#DISPLAY        ;DISPLAY TEST NUMBER
(1)  006206  013716  001106              MOV     $LPADR,(SP)             ;FUDGE RETURN ADDRESS
(1)  006212  000002                      RTI                             ;FIXES PS
(1)  006214  000010              $MXCNT: 10                              ;MAX. NUMBER OF ITERATIONS
681                              ;;**************************************************************
(1)
(1)                              .SBTTL  TYPE ROUTINE
(1)
(1)                              ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
(1)                              ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
(1)                              ;*NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
(1)                              ;*NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
(1)                              ;*NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
(1)                              ;*
(1)                              ;*CALL:
(1)                              ;*1) USING A TRAP INSTRUCTION
(1)                              ;*      TYPE    ,MESADR                 ;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
(1)                              ;*OR
```

```
(1)                                     ;*      TYPE
(1)                                     ;*      MESADR
(1)                                     ;*
(1)                                     ;*2) USING A JSR INSTRUCTION
(1)                                     ;*      MOV     PS,-(SP)        ;PUSH PROCESSOR STATUS WORD ON THE STACK
(1)                                     ;*      JSR     PC,$TYPE        ;CALL TYPE ROUTINE
(1)                                     ;*      MESADDR                 ;FIRST ADRESS OF MESSAGE
(1)
(1)  006216  105737  001151             $TYPE:  TSTB    $TPFLG          ;IS THERE A TERMINAL?
(1)  006222  100002                             BPL     1$              ;BR IF YES
(1)  006224  000000                             HALT                    ;HALT HERE IF NO TERMINAL
(1)  006226  000407                             BR      3$              ;LEAVE
(1)  006230  010046                     1$:     MOV     R0,-(SP)        ;SAVE R0
(1)  006232  017600  000002                     MOV     @2(SP),R0       ;GET ADDRESS OF ASCIZ STRING
(1)  006236  112046                     2$:     MOVB    (R0)+,-(SP)     ;PUSH CHARACTER TO BE TYPED ONTO STACK
(1)  006240  001005                             BNE     4$              ;BR IF IT ISN'T THE TERMINATOR
(1)  006242  005726                             TST     (SP)+           ;IF TERMINATOR POP IT OFF THE STACK
(1)  006244  012600                             MOV     (SP)+,R0        ;RESTORE R0
(1)  006246  062716  000002             3$:     ADD     #2,(SP)         ;ADJUST RETURN PC
(1)  006252  000002                             RTI                     ;RETURN
(1)  006254  004737  006306             4$:     JSR     PC,7$           ;GO TYPE THIS CHARACTER
(1)  006260  123726  001150             5$:     CMPB    $FILLC,(SP)+    ;IS IT TIME FOR FILLER CHARS.?
(1)  006264  001364                             BNE     2$              ;IF NO GO GET NEXT CHAR.
(1)  006266  013746  001146                     MOV     $NULL,-(SP)     ;GET # OF FILLER CHARS. NEEDED
(1)                                                                     ;AND THE NULL CHAR.
(1)  006272  105366  000001             6$:     DECB    1(SP)           ;DOES A NULL NEED TO BE TYPED?
(1)  006276  002770                             BLT     5$              ;BR IF NO--GO POP THE NULL OFF OF STACK
(1)  006300  004737  006306                     JSR     PC,7$           ;GO TYPE A NULL
(1)  006304  000772                             BR      6$              ;LOOP
(1)  006306  105777  172630             7$:     TSTB    @$TPS           ;WAIT UNTIL PRINTER IS READY
(1)  006312  100375                             BPL     7$
(1)  006314  116677  000002  172622             MOVB    2(SP),@$TPB     ;LOAD CHAR TO BE TYPED INTO DATA REG.
(1)  006322  000207                             RTS     PC
682                                     ;;**************************************************************
(1)
(1)                                     .SBTTL  CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
(1)
(1)                                     ;#CALL:
(1)                                     ;#      MOV     NUM,-(SP)       ;PUT THE BINARY NUMBER ON THE STACK
(1)                                     ;#      TYPDS                   ;GO TO THE ROUTINE
(1)
(2)  006324                             $TYPDS:
(3)  006324  010046                             MOV     R0,-(SP)        ;PUSH R0 ON STACK
(3)  006326  010146                             MOV     R1,-(SP)        ;PUSH R1 ON STACK
(3)  006330  010246                             MOV     R2,-(SP)        ;PUSH R2 ON STACK
(3)  006332  010346                             MOV     R3,-(SP)        ;PUSH R3 ON STACK
(3)  006334  010546                             MOV     R5,-(SP)        ;PUSH R5 ON STACK
(1)  006336  012746  020200                     MOV     #20200,-(SP)    ;SET BLANK SWITCH AND SIGN
(1)  006342  016605  000020                     MOV     20(SP),R5       ;GET THE INPUT NUMBER
(1)  006346  100004                             BPL     1$              ;BR IF INPUT IS POS.
(1)  006350  005405                             NEG     R5              ;MAKE THE BINARY NUMBER POS.
(1)  006352  112766  000055  000001             MOVB    #'-,1(SP)       ;MAKE THE ASCII NUMBER NEG.
(1)  006360  005000                     1$:     CLR     R0              ;ZERO THE CONSTANTS INDEX
(1)  006362  012703  006540                     MOV     #$DBLK,R3       ;SETUP THE OUTPUT POINTER
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(1)  006366  112723  000040                    MOVB    #' ,(R3)+       ;SET THE FIRST CHARACTER TO A BLANK
(1)  006372  005002                      2$:   CLR     R2              ;CLEAR THE BCD NUMBER
(1)  006374  016001  006530                    MOV     $DTBL(R0),R1    ;GET THE CONSTANT
(1)  006400  160105                      3$:   SUB     R1,R5           ;FORM THIS BCD DIGIT
(1)  006402  002402                            BLT     4$              ;BR IF DONE
(1)  006404  005202                            INC     R2              ;INCREASE THE BCD DIGIT BY 1
(1)  006406  000774                            BR      3$
(1)  006410  060105                      4$:   ADD     R1,R5           ;ADD BACK THE CONSTANT
(1)  006412  005702                            TST     R2              ;CHECK IF BCD DIGIT=0
(1)  006414  001002                            BNE     5$              ;FALL THROUGH IF 0
(1)  006416  105716                            TSTB    (SP)            ;STILL DOING LEADING 0'S?
(1)  006420  100407                            BMI     7$              ;BR IF YES
(1)  006422  106316                      5$:   ASLB    (SP)            ;MSD?
(1)  006424  103003                            BCC     6$              ;BR IF NO
(1)  006426  116663  000001  177777            MOVB    1(SP),-1(R3)    ;YES--SET THE SIGN
(1)  006434  052702  000060              6$:   BIS     #'0,R2          ;MAKE THE BCD DIGIT ASCII
(1)  006440  052702  000040              7$:   BIS     #' ,R2          ;MAKE IT A SPACE IF NOT ALREADY A DIGIT
(1)  006444  110223                            MOVB    R2,(R3)+        ;PUT THIS CHARACTER IN THE OUTPUT BUFFER
(1)  006446  005720                            TST     (R0)+           ;JUST INCREMENTING
(1)  006450  020027  000010                    CMP     R0,#10          ;CHECK THE TABLE INDEX
(1)  006454  002746                            BLT     2$              ;GO DO THE NEXT DIGIT
(1)  006456  003002                            BGT     8$              ;GO TO EXIT
(1)  006460  010502                            MOV     R5,R2           ;GET THE LSD
(1)  006462  000764                            BR      6$              ;GO CHANGE TO ASCII
(1)  006464  105726                      8$:   TSTB    (SP)+           ;WAS THE LSD THE FIRST NON-ZERO?
(1)  006466  100003                            BPL     9$              ;BR IF NO
(1)  006470  116663  177777  177776            MOVB    -1(SP),-2(R3)   ;YES--SET THE SIGN FOR TYPING
(1)  006476  105013                      9$:   CLRB    (R3)            ;SET THE TERMINATOR
(3)  006500  012605                            MOV     (SP)+,R5        ;POP STACK INTO R5
(3)  006502  012603                            MOV     (SP)+,R3        ;POP STACK INTO R3
(3)  006504  012602                            MOV     (SP)+,R2        ;POP STACK INTO R2
(3)  006506  012601                            MOV     (SP)+,R1        ;POP STACK INTO R1
(3)  006510  012600                            MOV     (SP)+,R0        ;POP STACK INTO R0
(1)  006512  104400  006540                    TYPE    ,$DBLK          ;NOW TYPE THE NUMBER
(1)  006516  016666  000002  000004            MOV     2(SP),4(SP)     ;ADJUST THE STACK
(1)  006524  012616                            MOV     (SP)+,(SP)
(1)  006526  000002                            RTI                     ;RETURN TO USER
(1)  006530  023420                      $DTBL:  10000.
(1)  006532  001750                              1000.
(1)  006534  000144                              100.
(1)  006536  000012                              10.
(1)  006540  000004                      $DBLK:  .BLKW   4
683                                      ;;*****************************************************************
(1)
(1)                                      .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
(1)
(1)                                      ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
(1)                                      ;*CALL:
(1)                                      ;*      MOV     NUM,-(SP)       ;NUMBER TO BE TYPED
(1)                                      ;*      TYPOS                   ;CALL FOR TYPEOUT
(1)                                      ;*      .BYTE   N               ;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
(1)                                      ;*      .BYTE   M               ;M=1 OR 0
(1)                                      ;*                                      ;1=TYPE LEADING ZEROS
(1)                                      ;*                                      ;0=SUPPRESS LEADING ZEROS
```

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(1)                                     ;*
(1)                                     ;*STYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
(1)                                     ;*STYPOS OR STYPOC
(1)                                     ;*CALL:
(1)                                     ;*      MOV     NUM,-(SP)               ;NUMBER TO BE TYPED
(1)                                     ;*      TYPON                           ;CALL FOR TYPEOUT
(1)                                     ;*
(1)                                     ;*STYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
(1)                                     ;*CALL:
(1)                                     ;*      MOV     NUM,-(SP)               ;NUMBER TO BE TYPED
(1)                                     ;*      TYPOC                           ;CALL FOR TYPEOUT
(1)
(1)  006550  017646  000000          STYPOS: MOV     @(SP),-(SP)             ;PICKUP THE MODE
(1)  006554  116637  000001  006773          MOVB    1(SP),$OFILL            ;LOAD ZERO FILL SWITCH
(1)  006562  112637  006775                   MOVB    (SP)+,$OMODE+1          ;NUMBER OF DIGITS TO TYPE
(1)  006566  062716  000002                   ADD     #2,(SP)                 ;ADJUST RETURN ADDRESS
(1)  006572  000406                           BR      $TYPON
(1)  006574  112737  000001  006773  STYPOC: MOVB    #1,$OFILL               ;SET THE ZERO FILL SWITCH
(1)  006602  112737  000006  006775          MOVB    #6,$OMODE+1             ;SET FOR SIX(6) DIGITS
(1)  006610  112737  000005  006772  STYPON: MOVB    #5,$OCNT                ;SET THE ITERATION COUNT
(1)  006616  010346                           MOV     R3,-(SP)                ;SAVE R3
(1)  006620  010446                           MOV     R4,-(SP)                ;SAVE R4
(1)  006622  010546                           MOV     R5,-(SP)                ;SAVE R5
(1)  006624  113704  006775                   MOVB    $OMODE+1,R4             ;GET THE NUMBER OF DIGITS TO TYPE
(1)  006630  005404                           NEG     R4
(1)  006632  062704  000006                   ADD     #6,R4                   ;SUBTRACT IT FOR MAX. ALLOWED
(1)  006636  110437  006774                   MOVB    R4,$OMODE               ;SAVE IT FOR USE
(1)  006642  113704  006773                   MOVB    $OFILL,R4               ;GET THE ZERO FILL SWITCH
(1)  006646  016605  000012                   MOV     12(SP),R5               ;PICKUP THE INPUT NUMBER
(1)  006652  005003                           CLR     R3                      ;CLEAR THE OUTPUT WORD
(1)  006654  006105                   1$:     ROL     R5                      ;ROTATE MSB INTO "C"
(1)  006656  000404                           BR      3$                      ;GO DO MSB
(1)  006660  006105                   2$:     ROL     R5                      ;FORM THIS DIGIT
(1)  006662  006105                           ROL     R5
(1)  006664  006105                           ROL     R5
(1)  006666  010503                           MOV     R5,R3
(1)  006670  006103                   3$:     ROL     R3                      ;GET LSB OF THIS DIGIT
(1)  006672  105337  006774                   DECB    $OMODE                  ;TYPE THIS DIGIT?
(1)  006676  100016                           BPL     7$                      ;BR IF NO
(1)  006700  042703  177770                   BIC     #177770,R3              ;GET RID OF JUNK
(1)  006704  001002                           BNE     4$                      ;TEST FOR 0
(1)  006706  005704                           TST     R4                      ;SUPPRESS THIS 0?
(1)  006710  001403                           BEQ     5$                      ;BR IF YES
(1)  006712  005204                   4$:     INC     R4                      ;DON'T SUPPRESS ANYMORE 0'S
(1)  006714  052703  000060                   BIS     #'0,R3                  ;MAKE THIS DIGIT ASCII
(1)  006720  052703  000040           5$:     BIS     #' ,R3                  ;MAKE ASCII IF NOT ALREADY
(1)  006724  110337  006770                   MOVB    R3,8$                   ;SAVE FOR TYPING
(1)  006730  104400  006770                   TYPE    ,8$                     ;GO TYPE THIS DIGIT
(1)  006734  105337  006772           7$:     DECB    $OCNT                   ;COUNT BY 1
(1)  006740  003347                           BGT     2$                      ;BR IF MORE TO DO
(1)  006742  002402                           BLT     6$                      ;BR IF DONE
(1)  006744  005204                           INC     R4                      ;INSURE LAST DIGIT ISN'T A BLANK
(1)  006746  000744                           BR      2$                      ;GO DO THE LAST DIGIT
(1)  006750  012605                   6$:     MOV     (SP)+,R5                ;RESTORE R5
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(1)  006752  012604                        MOV     (SP)+,R4        ;RESTORE R4
(1)  006754  012603                        MOV     (SP)+,R3        ;RESTORE R3
(1)  006756  016666  000002  000004        MOV     2(SP),4(SP)     ;SET THE STACK FOR RETURNING
(1)  006764  012616                        MOV     (SP)+,(SP)
(1)  006766  000002                        RTI                     ;RETURN
(1)  006770     000             BS:        .BYTE   0               ;STORAGE FOR ASCII DIGIT
(1)  006771     000                        .BYTE   0               ;TERMINATOR FOR TYPE ROUTINE
(1)  006772     000             $OCNT:     .BYTE   0               ;OCTAL DIGIT COUNTER
(1)  006773     000             $OFILL:    .BYTE   0               ;ZERO FILL SWITCH
(1)  006774  000000             $OMODE:    0                       ;NUMBER OF DIGITS TO TYPE
684                                         ;;**************************************************************
(1)
(1)                                         .SBTTL  ERROR MESSAGE TYPEOUT ROUTINE
(1)
(1)                                         ;*THIS ROUTINE USES THE "ITEM CONTROL BYTE" ($ITEMB) TO DETERMINE WHICH
(1)                                         ;*ERROR IS TO BE REPORTED. IT THEN OBTAINS, FROM THE "ERROR TABLE" ($ERRTB),
(1)                                         ;*AND REPORTS THE APPROPRIATE INFORMATION CONCERNING THE ERROR.
(1)
(1)  006776                         $ERRTYP:
(1)  006776  104400  001225                TYPE    ,$CRLF          ;"CARRIAGE RETURN" & "LINE FEED"
(1)  007002  010046                        MOV     R0,-(SP)        ;SAVE R0
(1)  007004  005000                        CLR     R0              ;PICKUP THE ITEM INDEX
(1)  007006  153700  001114                BISB    @#$ITEMB,R0
(1)  007012  001004                        BNE     1$              ;IF ITEM NUMBER IS ZERO, JUST
(1)                                                                 ;TYPE THE PC OF THE ERROR
(2)  007014  013746  001116                MOV     $ERRPC,-(SP)    ;SAVE $ERRPC FOR TYPEOUT
(2)                                                                 ;ERROR ADDRESS
(2)  007020  104402                        TYPOC                   ;GO TYPE--OCTAL ASCII(ALL DIGITS)
(1)  007022  000426                        BR      6$              ;GET OUT
(1)  007024  005300             1$:        DEC     R0              ;ADJUST THE INDEX SO THAT IT WILL
(1)  007026  006300                        ASL     R0              ;       WORK FOR THE ERROR TABLE
(1)  007030  006300                        ASL     R0
(1)  007032  006300                        ASL     R0
(1)  007034  062700  001232                ADD     #$ERRTB,R0      ;FORM TABLE POINTER
(1)  007040  012037  007050                MOV     (R0)+,2$        ;PICKUP "ERROR MESSAGE" POINTER
(1)  007044  001404                        BEQ     3$              ;SKIP TYPEOUT IF NO POINTER
(1)  007046  104400                        TYPE                    ;TYPE THE "ERROR MESSAGE"
(1)  007050  000000             2$:        .WORD   0               ;"ERROR MESSAGE" POINTER GOES HERE
(1)  007052  104400  001225                TYPE    ,$CRLF          ;"CARRIAGE RETURN" & "LINE FEED"
(1)  007056  012037  007066     3$:        MOV     (R0)+,4$        ;PICKUP "DATA HEADER" POINTER
(1)  007062  001404                        BEQ     5$              ;SKIP TYPEOUT IF 0
(1)  007064  104400                        TYPE                    ;TYPE THE "DATA HEADER"
(1)  007066  000000             4$:        .WORD   0               ;"DATA HEADER" POINTER GOES HERE
(1)  007070  104400  001225                TYPE    ,$CRLF          ;"CARRIAGE RETURN" & "LINE FEED"
(1)  007074  011000             5$:        MOV     (R0),R0         ;PICKUP "DATA TABLE" POINTER
(1)  007076  001004                        BNE     7$              ;GO TYPE THE DATA
(1)  007100  012600             6$:        MOV     (SP)+,R0        ;RESTORE R0
(1)  007102  104400  001225                TYPE    ,$CRLF          ;"CARRIAGE RETURN" & "LINE FEED"
(1)  007106  000207                        RTS     PC              ;RETURN
(2)  007110                         7$:
(2)  007110  013046                        MOV     @(R0)+,-(SP)    ;SAVE @(R0)+ FOR TYPEOUT
(2)  007112  104402                        TYPOC                   ;GO TYPE--OCTAL ASCII(ALL DIGITS)
(1)  007114  005710                        TST     (R0)            ;IS THERE ANOTHER NUMBER?
(1)  007116  001770                        BEQ     6$              ;BR IF NO
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(1)  007120  104400  007126                TYPE    ,8$                     ;TYPE TWO(2) SPACES
(1)  007124  000771                        BR      7$                      ;LOOP
(1)  007126  020040     000        8$:     .ASCIZ  /  /                    ;TWO(2) SPACES
(1)          007132                        .EVEN
693                                 ;;*****************************************************************
(1)
(1)                                 .SBTTL  ERROR HANDLER ROUTINE
(1)
(1)                                 ;*SW15=1        HALT ON ERROR
(1)                                 ;*SW13=1        INHIBIT ERROR TYPEOUTS
(1)                                 ;*SW10=1        BELL ON ERROR
(1)                                 ;*SW09=1        LOOP ON ERROR
(1)                                 ;*GO TO SERRTYP ON ERROR
(1)
(1)  007132                         $ERROR:
(3)  007132  010637  001170                MOV     SP,$REG6        ;GET THE CURRENT STACK POINTER VALUE
(3)  007136  162737  000004  001170        SUB     #4,$REG6                ;RESTORE IT TO ITS "PRE ERROR TRAP" VALUE FOR PR
(3)  007144  016637  000002  001172        MOV     2(SP),$REG7             ;GET THE PS OFF OF THE STACK
(3)  007152  005037  001166                CLR     $REG5                   ;PREPARE "$REG5" TO HOLD THE TEST #
(3)  007156  113737  001102  001166        MOVB    $TSTNM,$REG5            ;TEST # IS HELD IN THE LOW BYTE OF "TSTNM"
(3)  007164  010037  001154                MOV     R0,$REG0                ;MOST OF THE TIME R0 HAS GOOD STUFF IN IT ALSO
(1)  007170  105237  001103        7$:     INCB    $ERFLG                  ;SET THE ERROR FLAG
(1)  007174  001775                        BEQ     7$                      ;DON'T LET THE FLAG GO TO ZERO
(1)  007176  013737  001102  177570        MOV     $TSTNM,@#DISPLAY        ;DISPLAY TEST NUMBER AND ERROR FLAG
(1)  007204  032737  002000  177570        BIT     #SW10,@#SWR             ;BELL ON ERROR?
(1)  007212  001402                        BEQ     1$                      ;NO - SKIP
(1)  007214  104400  001220                TYPE    ,$BELL                  ;RING BELL
(1)  007220  005237  001112        1$:     INC     $ERTTL                  ;COUNT THE NUMBER OF ERRORS
(1)  007224  011637  001116                MOV     (SP),$ERRPC             ;GET ADDRESS OF ERROR INSTRUCTION
(1)  007230  162737  000002  001116        SUB     #2,$ERRPC
(1)  007236  117737  171654  001114        MOVB    @$ERRPC,$ITEMB          ;STRIP AND SAVE THE ERROR ITEM CODE
(1)  007244  032737  020000  177570        BIT     #SW13,@#SWR             ;SKIP TYPEOUT IF SET
(1)  007252  001004                        BNE     2$                      ;SKIP TYPEOUTS
(1)  007254  004737  006776                JSR     PC,@#$ERRTYP            ;GO TO USER ERROR ROUTINE
(1)  007260  104400  001225                TYPE    ,$CRLF
(1)  007264  005737  177570        2$:     TST     @#SWR                   ;HALT ON ERROR
(1)  007270  100001                        BPL     3$                      ;SKIP IF CONTINUE
(1)  007272  000000                        HALT                            ;HALT ON ERROR!
(1)  007274  032737  001000  177570  3$:     BIT     #SW09,@#SWR            ;LOOP ON ERROR SWITCH SET?
(1)  007302  001402                        BEQ     4$                      ;BR IF NO
(1)  007304  013716  001110                MOV     $LPERR,(SP)             ;FUDGE RETURN FOR LOOPING
(1)  007310  005737  001216        4$:     TST     $ESCAPE                 ;CHECK FOR AN ESCAPE ADDRESS
(1)  007314  001402                        BEQ     5$                      ;BR IF NONE
(1)  007316  013716  001216                MOV     $ESCAPE,(SP)            ;FUDGE RETURN ADDRESS FOR ESCAPE
(1)  007322  000002                 5$:    RTI                             ;RETURN
694                                 ;;*****************************************************************
(1)
(1)                                 .SBTTL  TRAP DECODER
(1)
(1)                                 ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
(1)                                 ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
(1)                                 ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
(1)                                 ;*GO TO THAT ROUTINE.
(1)
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(1)  007324  010046                 $TRAP:  MOV     R0,-(SP)            ;SAVE R0
(1)  007326  016600  000002                 MOV     2(SP),R0            ;GET TRAP ADDRESS
(1)  007332  005740                         TST     -(R0)               ;BACKUP BY 2
(1)  007334  111000                         MOVB    (R0),R0             ;GET RIGHT BYTE OF TRAP
(1)  007336  016000  007344                 MOV     $TRPAD(R0),R0       ;INDEX TO TABLE
(1)  007342  000200                         RTS     R0                  ;GO TO ROUTINE
(1)
(3)
(3)                                  .SBTTL  TRAP TABLE
(3)
(3)                                  ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
(3)                                  ;*BY THE "TRAP" INSTRUCTION.
(3)
(3)                                  ;       ROUTINE
(3)                                  ;       -------
(3)  007344                          $TRPAD:
(3)  007344  006216                         $TYPE           ;CALL=TYPE      TRAP+0(104400)  TTY TYPEOUT ROUTINE
(3)  007346  006574                         $TYPOC          ;CALL=TYPOC     TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING
(3)  007350  006550                         $TYPOS          ;CALL=TYPOS     TRAP+4(104404)  TYPE OCTAL NUMBER (NO LEADING ZE
(3)  007352  006610                         $TYPON          ;CALL=TYPON     TRAP+6(104406)  TYPE OCTAL NUMBER (AS PER LAST C
(3)  007354  006324                         $TYPDS          ;CALL=TYPDS     TRAP+10(104410) TYPE DECIMAL NUMBER (WITH SIGN)
 695                                 ;;*****************************************************************
(1)
(1)                                  .SBTTL  POWER DOWN AND UP ROUTINES
(1)
(1)                                  ;POWER DOWN ROUTINE
(1)  007356  012737  007520  000024 $PWRDN: MOV     #$ILLUP,@#PWRVEC    ;SET FOR FAST UP
(1)  007364  012737  000340  000026         MOV     #340,@#PWRVEC+2     ;PRIO:7
(3)  007372  010046                         MOV     R0,-(SP)            ;PUSH R0 ON STACK
(3)  007374  010146                         MOV     R1,-(SP)            ;PUSH R1 ON STACK
(3)  007376  010246                         MOV     R2,-(SP)            ;PUSH R2 ON STACK
(3)  007400  010346                         MOV     R3,-(SP)            ;PUSH R3 ON STACK
(3)  007402  010446                         MOV     R4,-(SP)            ;PUSH R4 ON STACK
(3)  007404  010546                         MOV     R5,-(SP)            ;PUSH R5 ON STACK
(3)  007406  013746  007746                 MOV     POWPUS,-(SP)        ;PUSH POWPUS ON STACK
(3)  007412  013746  007750                 MOV     POWPOP,-(SP)        ;PUSH POWPOP ON STACK
(3)  007416  013746  007536                 MOV     POWMES,-(SP)        ;PUSH POWMES ON STACK
(3)  007422  013746  001550                 MOV     T0001,-(SP)         ;PUSH T0001 ON STACK
(1)  007426  010637  007524                 MOV     SP,$SAVR6           ;SAVE SP
(1)  007432  012737  007444  000024         MOV     #$PWRUP,@#PWRVEC    ;SET UP VECTOR
(1)  007440  000000                         HALT
(1)  007442  000776                         BR      .-2                 ;HANG UP
(1)
(1)                                  ;POWER UP ROUTINE
(1)  007444  013706  007524          $PWRUP: MOV     $SAVR6,SP           ;GET SP
(1)  007450  005037  007524                  CLR     $SAVR6              ;WAIT LOOP FOR THE TTY
(1)  007454  005237  007524          1$:     INC     $SAVR6              ;WAIT FOR THE INC
(1)  007460  001375                         BNE     1$                  ;OF <POWPUS>,<POWPOP>,<POWMES>,<T0001> WORD
(3)  007462  012605                         MOV     (SP)+,R5            ;POP STACK INTO R5
(3)  007464  012604                         MOV     (SP)+,R4            ;POP STACK INTO R4
(3)  007466  012603                         MOV     (SP)+,R3            ;POP STACK INTO R3
(3)  007470  012602                         MOV     (SP)+,R2            ;POP STACK INTO R2
(3)  007472  012601                         MOV     (SP)+,R1            ;POP STACK INTO R1
(3)  007474  012600                         MOV     (SP)+,R0            ;POP STACK INTO R0
```

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(1)  007476  012737  007356  000024          MOV     #$PWRDN,@#PWRVEC        ;SET UP THE POWER DOWN VECTOR
(1)  007504  012737  000340  000026          MOV     #340,@#PWRVEC+2         ;PRIO:7
(1)  007512  104400  007526                  TYPE    ,$POWER                 ;POWER FAIL MESSAGE
(1)  007516  000002                          RTI
(1)  007520  000000                $ILLUP:   HALT                            ;THE POWER UP SEQUENCE WAS STARTED
(1)  007522  000776                          BR      .-2                     ; BEFORE THE POWER DOWN WAS COMPLETE
(1)  007524  000000                $SAVR6:   0                               ;PUT THE SP HERE
(1)  007526  005015  047520  042527  $POWER:  .ASCIZ  <15><12>"POWER"
(1)  007534  000122
(1)                                          .EVEN
696  007536  005015  042522  052123  POWMES:  .ASCIZ <15> <12> "RESTARTING AFTER A POWER FIALURE" <15> <12> <12>
     007544  051101  044524  043516
     007552  040440  052106  051105
     007560  040440  050040  053517
     007566  051105  043040  040511
     007574  052514  042522  005015
     007602  000012
697  007604  005015  046412  026504  STMES:   .ASCIZ  <15><12><12>"MD-11-DZKWA-D LINE FREQUENCY CLOCK TEST"<15><12>
     007612  030461  042055  045532
     007620  040527  042055  046040
     007626  047111  020105  051106
     007634  050505  042525  041516
     007642  020131  046103  041517
     007650  020113  042524  052123
     007656  005015     000
698
699  007661     124  040522  050120  TRPMES:  .ASCIZ  "TRAPPED TO LOC 4 FROM LOCATION  "
     007666  042105  052040  020117
     007674  047514  020103  020064
     007702  051106  046517  046040
     007710  041517  052101  047511
     007716  020116  000040
700  007722  042522  052123  051101  TRPM2S:  .ASCIZ  "RESTARTING PROGRAM"
     007730  044524  043516  050040
     007736  047522  051107  046501
     007744     000
701          007746                          .EVEN
702  007746  001230                  POWPUS:  WORD
703  007750  001230                  POWPOP:  WORD
704  007752  020040  020040  020040  EM1:     .ASCIZ  "                                LKS     LKS     "
     007760  020040  020040  020040
     007766  020040  020040  020040
     007774  020040  020040  020040
     010002  020040  020040  020040
     010010  020040  045514  020123
     010016  020040  020040  045514
     010024  020123  020040  020040
     010032     000
705  010033     050  041520  020051  DH1:     .ASCIZ  "(PC)    (PS)    (SP)    TEST#   WAS     S/B     "
     010040  020040  024040  051520
     010046  020051  020040  024040
     010054  050123  020051  020040
     010062  052040  051505  021524
     010070  020040  053440  051501
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        010076  020040  020040  051440
        010104  041057  020040  020040
        010112  000040
706                                     .EVEN
707     010114  001116  001172  001170  DT1:    $ERRPC,$REG7,$REG6,$REG5,LKS,$GDDAT
        010122  001166  177546  001124
708     010130  000000                  0
709     010132  046103  041517  020113  EM2:    .ASCIZ  "CLOCK FAILED TO INTERRUPT"
        010140  040506  046111  042105
        010146  052040  020117  047111
        010154  042524  051122  050125
        010162  000124
710     010164  050050  024503  020040  DH2:    .ASCIZ  "(PC)    (PS)    (SP)    TEST#   (LKS)   "
        010172  020040  050050  024523
        010200  020040  020040  051450
        010206  024520  020040  020040
        010214  042524  052123  020043
        010222  020040  046050  051513
        010230  020051  020040     000
711             010236                  .EVEN
712     010236  001116  001172  001170  DT2:    $ERRPC,$REG7,$REG6,$REG5,LKS
        010244  001166  177546
713     010250  000000                  0
714     010252  046103  041517  020113  EM3:    .ASCIZ  "CLOCK INTERRUPTED WHEN THE PROCESSOR PRIORITY WAS TOO HIGH"
        010260  047111  042524  051122
        010266  050125  042524  020104
        010274  044127  047105  052040
        010302  042510  050040  047522
        010310  042503  051523  051117
        010316  050040  044522  051117
        010324  052111  020131  040527
        010332  020123  047524  020117
        010340  044510  044107     000
715     010345     050  041520  020051  DH3:    .ASCIZ  "(PC)    (PS)    (SP)    TEST#   (LKS)   "
        010352  020040  024040  051520
        010360  020051  020040  024040
        010366  050123  020051  020040
        010374  052040  051505  021524
        010402  020040  024040  045514
        010410  024523  020040  000040
716                                     .EVEN
717     010416  001116  001172  001170  DT3:    $ERRPC,$REG7,$REG6,$REG5,LKS
        010424  001166  177546
718     010430  000000                  0
719     010432  046103  041517  020113  EM4:    .ASCIZ  "CLOCK GIVES UNEQUAL # OF PULSES OVER TWO EQUAL PERIODS OF TIME"
        010440  044507  042526  020123
        010446  047125  050505  040525
        010454  020114  020043  043117
        010462  050040  046125  042523
        010470  020123  053117  051105
        010476  052040  047527  042440
        010504  052521  046101  050040
        010512  051105  047511  051504
        010520  047440  020106  044524
```

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        010526  042515  000
  720   010531  050  041520  020051  DH4:    .ASCIZ  "(PC)    (PS)    (SP)    TEST#   1ST     2ND"<15><12>"
        010536  020040  024040  051520
        010544  020051  020040  024040
        010552  [illegible]  020051  020040
        010560  [illegible]  051505  021524
        010566  020040  030440  052123
        010574  020040  020040  031040
        010602  042116  005015  020040
        010610  020040  020040  020040
        010616  020040  020040  020040
        010624  020040  020040  020040
        010632  020040  020040  020040
        010640  020040  020040  020040
        010646  042520  044522  042117
        010654  020040  042520  044522
        010662  042117  000
  721           010666                  .EVEN
  722   010666  001116  001172  001170  DT4:    $ERRPC,$REG7,$REG6,$REG5,$REG1,$REG2
        010674  001166  001156  001160
  723   010702  000000                  0
  724   010704  045514  020123  042522  EM5:    .ASCIZ  "LKS REGISTER RESPONDS TO ANOTHER ADDRESS"
        010712  044507  052123  051105
        010720  051040  051505  047520
        010726  042116  020123  047524
        010734  040440  047516  044124
        010742  051105  040440  042104
        010750  042522  051523  000
  725   010755  050  041520  020051  DH5:    .ASCIZ  "(PC)    (PS)    (SP)    TEST#   ADDRESS"
        010762  020040  024040  051520
        010770  020051  020040  024040
        010776  050123  020051  020040
        011004  052040  051505  021524
        011012  020040  040440  042104
        011020  042522  051523  000
  726           011026                  .EVEN
  727   011026  001116  001172  001170  DT5:    $ERRPC,$REG7,$REG6,$REG5,$GDADR
        011034  001166  001120
  728   011040  000000                  0
  729   011042  020101  047516  051440  EM6:    .ASCIZ  "A NO SACK TIMEOUT HAS OCCURED"
        011050  041501  020113  044524
        011056  042515  052517  020124
        011064  040510  020123  041517
        011072  052503  042522  000104
  730   011100  050050  024503  020040  DH6:    .ASCIZ  "(PC)    (PS)    (SP)    TEST#   (LKS)   "
        011106  020040  050050  024523
        011114  020040  020040  051450
        011122  024520  020040  020040
        011130  042524  052123  020043
        011136  020040  046050  051513
        011144  020051  020040  000
  731           011152                  .EVEN
  732   011152  001116  001172  001170  DT6:    $ERRPC,$REG7,$REG6,$REG5,LKS
        011160  001166  177546
```

```
011164  000000                          0
011166  051127  047117  020107  EM7:    .ASCIZ  "WRONG CONDITION CODES WERE PUT ONTO STACK BY INTERRUPT"
011174  047503  042116  052111
011202  047511  020116  047503
011210  042504  020123  042527
011216  042522  050040  052125
011224  047440  052116  020117
011232  052123  041501  020113
011240  054502  044440  052116
011246  051105  052522  052120
011254     000
011255     050  041520  020051  DH7:    .ASCIZ  "(PC)    (PS)    (SP)    TEST#   CC WAS  CC S/B"
011262  020040  024040  051520
011270  020051  020040  024040
011276  050123  020051  020040
011304  052040  051505  021524
011312  020040  041440  020103
011320  040527  020123  041440
011326  020103  027523  000102
                                .EVEN
011334  001116  001172  001170  DT7:    $ERRPC,$REG7,$REG6,$REG5,BUF1,$GDDAT
011342  001166  000776  001124
011350  000000                          0
011352  051127  047117  020107  EM10:   .ASCIZ  "WRONG PC PUT ONTO THE STACK BY AN INTERRUPT"
011360  041520  050040  052125
011366  047440  052116  020117
011374  044124  020105  052123
011402  041501  020113  054502
011410  040440  020116  047111
011416  042524  051122  050125
011424  000124
011426  050050  024503  020040  DH10:   .ASCIZ  "(PC)    (PS)    (SP)    TEST#  @(SP)WAS @(SP)S/B  "
011434  020040  050050  024523
011442  020040  020040  051450
011450  024520  020040  020040
011456  042524  052123  020043
011464  040040  051450  024520
011472  040527  020123  024100
011500  050123  051451  041057
011506  020040     000
        011512                  .EVEN
011512  001116  001172  001170  DT10:   $ERRPC,$REG7,$REG6,$REG5,BUF2,$GDDAT
011520  001166  000774  001124
011526  000000                          0
011530  051124  042531  020104  EM11:   .ASCIZ  "TRYED TO ACCESS THE LKS REGISTER, AND TRAPPED"
011536  047524  040440  041503
011544  051505  020123  044124
011552  020105  045514  020123
011560  042522  044507  052123
011566  051105  020054  047101
011574  020104  051124  050101
011602  042520  000104
011606  050050  024503  020040  DH11:   .ASCIZ  "(PC)    (PS)    (SP)    TEST#"
011614  020040  050050  024523
```

```
        011622  020040  020040  051450
        011630  024520  020040  020040
        011636  042524  052123  000043
   746                                  .EVEN
   747  011644  001116  001172  001170  DT11:   $ERRPC,$REG7,$REG6,$REG5
        011652  001166
   748  011654  000000                  0
   749          000001                  .END
```

```
A0004   001762          A0005   002044          A0006   002150          A0007   002300
A0010   002430          A0011   002532          A0012   002666          A0013   002752
A0014   003272          A0015   003404          A0016   003516          A0017   003630
A0020   003742          A0021   004054          A0022   004202          A0023   004250
A0024   004366          A0025   004472          A0026   004634          A0027   004744
A0030   005100          A0031   005162          A0032   005310          A0033   005444
BIT0  = 000001          BIT00 = 000001          BIT01 = 000002          BIT02 = 000004
BIT03 = 000010          BIT04 = 000020          BIT05 = 000040          BIT06 = 000100
BIT07 = 000200          BIT08 = 000400          BIT09 = 001000          BIT1  = 000002
BIT10 = 002000          BIT11 = 004000          BIT12 = 010000          BIT13 = 020000
BIT14 = 040000          BIT15 = 100000          BIT2  = 000004          BIT3  = 000010
BIT4  = 000020          BIT5  = 000040          BIT6  = 000100          BIT7  = 000200
BIT8  = 000400          BIT9  = 001000          BPTVEC= 000014          BUF1  = 000776
BUF2  = 000774          B0005   002062          B0006   002166          B0007   002316
B0010   002446          B0011   002550          B0012   002704          B0013   002770
B0014   003304          B0015   003416          B0016   003530          B0017   003642
B0020   003754          B0021   004066          B0023   004266          B0025   004510
B0030   005112          B0031   005200          B0032   005326          B0033   005462
C0007   002326          C0010   002456          C0011   002600          C0013   003004
C0025   004530          C0031   005230          C0032   005370          C0033   005524
DH1     010033          DH10    011426          DH11    011606          DH2     010164
DH3     010345          DH4     010531          DH5     010755          DH6     011100
DH7     011255          DISPLA= 177570          DT1     010114          DT10    011512
DT11    011644          DT2     010236          DT3     010416          DT4     010666
DT5     011026          DT6     011152          DT7     011334          D0007   002340
D0010   002470          D0011   002616          D0013   003022          D0031   005246
EMTVEC= 000030          EM1     007752          EM10    011352          EM11    011530
EM2     010132          EM3     010252          EM4     010432          EM5     010704
EM6     011042          EM7     011166          ERRVEC= 000004          E0001   001606
E0002   001654          E0003   001720          E0004   001774          E0005   002056
E0006   002162          E0007   002312          E0010   002442          E0011   002544
E0012   002700          E0013   002764          E0014   003302          E0015   003414
E0016   003526          E0017   003640          E0020   003752          E0021   004064
E0022   004200          E0023   004262          E0024   004406          E0025   004504
E0026   004654          E0027   004776          E0030   005126          E0031   005174
E0032   005322          E0033   005456          E10006  002210          E10007  002334
E10010  002464          E10012  002720          E10013  003016          E10023  004304
E10025  004524          E10031  005242          E10033  005534          E1005   002100
E1011   002612          E20007  002346          E20010  002476          E20011  002624
E20013  003100          E20025  004540          E20031  005254          E30013  003132
E40013  003174          F0013   003026          G0013   003042          H0013   003066
IOTVEC= 000020          I0001   001600          I0014   003264          I0015   003376
I0016   003510          I0017   003622          I0020   003734          I0021   004046
I0022   004162          I0023   004266          I0026   004642          J0013   003104
KSTART  001400          K0013   003120          LKS   = 177546          L0013   003136
M0013   003150          NOP   = 000240          N0013   003164          PC    =x000007
PIRQ  = 177772          PIRQVE= 000240          POWMES  007536          POWPOP  007750
POWPUS  007746          PS    = 177776          PSW   = 177776          PWRVEC= 000024
RESVEC= 000010          R0    =x000000          R0001   001574          R0002   001634
R0003   001710          R0004   001746          R0005   002036          R0006   002142
R0007   002260          R0010   002410          R0011   002524          R0012   002660
R0013   002724          R0014   003254          R0015   003366          R0016   003500
R0017   003612          R0020   003724          R0021   004036          R0022   004152
R0023   004242          R0024   004352          R0025   004456          R0026   004616
```

B06

DZKWAD.P11 SYMBOL TABLE

```
R0027   004722    R0030   005036    R0031   005154    R0032   005302
R0033   005436    R1     =X000001   R1013   002736    R2     =X000002
R2013   002770    R3     =X000003   R3013   003052    R4     =X000004
R4013   003104    R5     =X000005   R6     =X000006   R7     =X000007
SP     =X000006   STACK  = 001100   START   001416    STKLMT= 177774
STMES   007604    SWR    = 177570   SW0    = 000001   SW00   = 000001
SW01   = 000002   SW02   = 000004   SW03   = 000010   SW04   = 000020
SW05   = 000040   SW06   = 000100   SW07   = 000200   SW08   = 000400
SW09   = 001000   SW1    = 000002   SW10   = 002000   SW11   = 004000
SW12   = 010000   SW13   = 020000   SW14   = 040000   SW15   = 100000
SW2    = 000004   SW3    = 000010   SW4    = 000020   SW5    = 000040
SW6    = 000100   SW7    = 000200   SW8    = 000400   SW9    = 001000
TBITVE= 000014    TKVEC  = 000060   TPVEC  = 000064   TRAPVE= 000034
TRAP0   005674    TRPMES  007661    TRPM2S  007722    TRTVEC= 000014
TYP0S  = 104410   TYPE   = 104400   TYP0C  = 104402   TYP0N  = 104406
TYP0S  = 104404   T0001    001550   T0002    001610   T0003    001656
T0004    001722   T0005    001776   T0006    002102   T0007    002212
T0010    002350   T0011    002500   T0012    002626   T0013    002722
T0014    003210   T0015    003352   T0016    003434   T0017    003546
T0020    003660   T0021    003772   T0022    004104   T0023    004210
T0024    004306   T0025    004410   T0026    004542   T0027    004656
T0030    005000   T0031    005130   T0032    005256   T0033    005412
T0034    005544   WORD     001230   $ERROR   001122   $ERRDAT  001126
$CELL    001220   $CMTAG   001100   $CM1    = 000010   $CM2    = 000020
$CM3    = 000010   $CM4    = 000010   $CRLF    001225   $CBLK    001540
$DORGN   005650   $DTBL     004530   $ERRORD  001140   $ENDCT   001510
$ENDMG   005654   $EMULL    001071   $ERP     001154   $EOPCT   001502
$ERFLG   001103   $ERMAX    001115   $ERROR   001132   $ERRPC   001116
$ERRTB   001232   $ERRTY    006776   $ERTTL   001112   $ESCAP   001216
$FILLC   001150   $FILLS    001147   $GOERR   001120   $GODAT   001124
$GET42   005632   $HD     = 000000   $ICNT    001104   $ILLUP   007520
$ITEMB   001114   $LF       001226   $LPADR   001106   $LPERR   001110
$MCCNT   004214   $NULL     001146   $OCNT    006772   $OMODE   006774
$OVER    001200   $PARS     001100   $PER     007526   $PWRDN   007356
$PWRUP   007444   $QUES     001224   $READ    001152   $REGO    001154
$REG1    001156   $REG2     001160   $REG3    001162   $REG4    001164
$REG5    001166   $REG6     001170   $REG7    001172   $SAVR6   007524
$SCOPE   005746   $SETUP=   000037   $STUP  = 177777   $SVLAD   006152
$SWR   = 167400   $TIMES    001214   $TKB      001140   $TKS     001136
$TMP0    001174   $TMP1     001176   $TMP2     001200   $TMP3    001202
$TMP4    001204   $TMP5     001206   $TMP6     001210   $TMP7    001212
$TN    = 000000   $TPB      001144   $TPFLG    001151   $TPS     001142
$TRAP    007324   $TRP    = 000012   $TRPAD    007344   $TSTNM   001102
$TYPDS   006324   $TYPE     006216   $TYPOC    006574   $TYPON   006610
$TYPOS   006550   $XTSTR    005756   $OFILL    006773   .      = 011656
```

ERRORS DETECTED: 0

#DZKWAD,DZKWAD+DZKWAD.P11
RUN-TIME: 40 21 0 SECONDS
CORE USED: 14K

C06

Spooler runtime 11 Seconds, 27 KCS, 271 disk reads, 0 disk writes, 67 pages