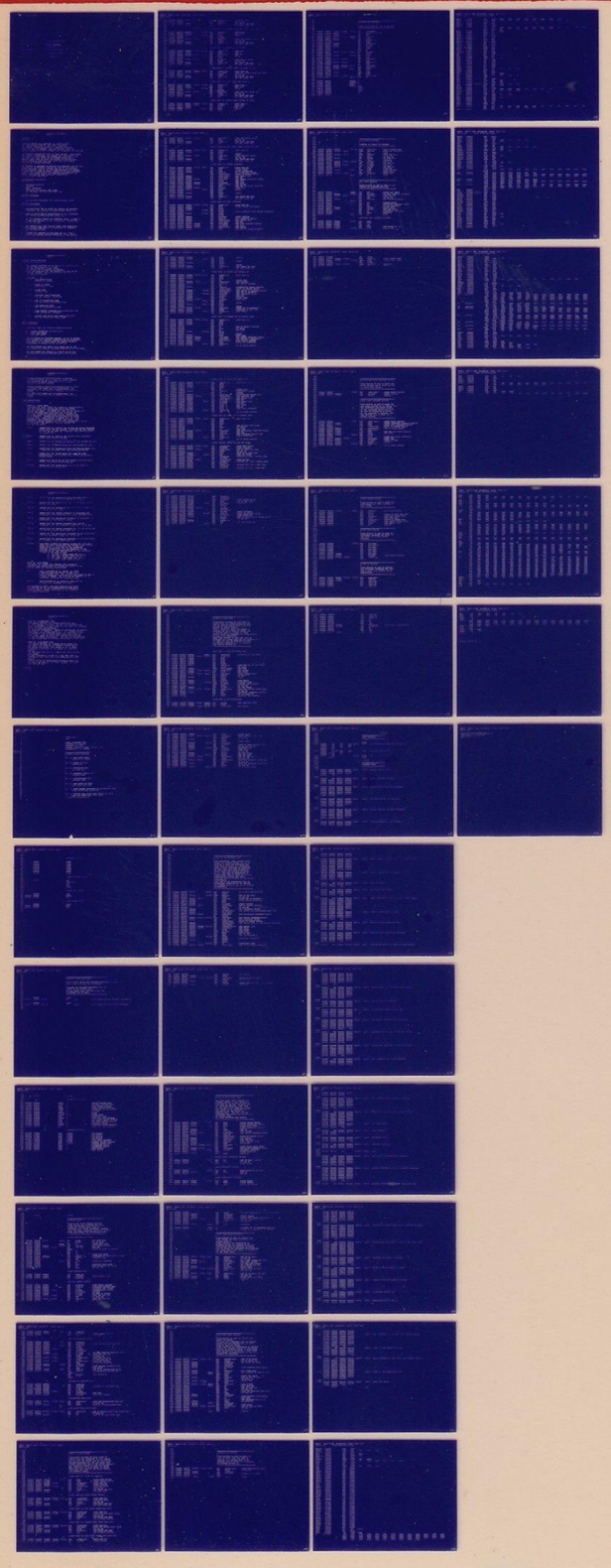
LPC11

INTERFACE DIAGNOSTIC TEST
MD-11-DZLPB-B

EP-DZLPB-B-DL

FICHE 1 OF 1

JUN 1978
digital
MADE IN USA



IDENTIFICATION

PRODUCT CODE:	MAINDEC-11-DZLFB-B-D
PRODUCT NAME:	LP11 INTERFACE DIAGNOSTIC TEST
DATE CREATED:	FEBRUARY 25, 1973
MAINTAINER:	DIAGNOSTIC GROUP
AUTHOR:	R.B. BARNES

1. ABSTRACT

THIS DIAGNOSTIC WILL EXERCISE ALL LOGIC FUNCTIONS
AND DATA CAPABILITIES OF THE LPC11 INTERFACE.
THE PROGRAM SHOULD BE STARTED AT LOCATION 200 AND
WILL TYPE OUT THE PROGRAM NAME AND REQUEST INPUT OF
VECTOR ADDRESS, REGISTER ADDRESS, AND INTERFACE MODE SETTING.

THE PROGRAM CONSISTS OF FOUR (4) TEST GROUPS: LOGIC TESTS,
DATA TESTS, MAINTENANCE MODE TESTS, AND LINE COUNT MODE.
THE LOGIC AND DATA TESTS ARE PERFORMED SEQUENTIALY;
(EXCEPT LOGIC TEST 22 WHICH IS ENTERED VIA SWITCH TEN).
THE MAINTENANCE MODE AND LINE COUNT MODE ARE ENTERED
THROUGH THE CONSOLE SWITCHES.

THE PROGRAM IS DESIGNED TO PROVIDE THE OPERATOR WITH AS MUCH
FLEXABILITY AS POSSIBLE THROUGH THE USE OF THE CONSOLE
SWITCH REGISTER. USE OF THE SWITCHES PROVIDES FOR CONTROL
OF ERROR PRINT, STOP ON ERROR, ITERATION OF DATA PATTERNS,
REPEAT LOOP, ERROR STATUS BIT TESTING, MAINTENANCE MODE
ENTRY, MAINTENANCE MODE INTERRUPT RECOGNITION,
AND LINE COUNT MODE ENTRY.

2. REQUIREMENTS (EQUIPMENT)

A. PDP-11/20,15,20,45
B. TELETYPE
C. LPC11 INTERFACE
D. PDP-11/45 AND KL11-L LINE CLOCK
   ARE REQUIRED FOR THE LINE COUNT MODE.

3. LOADING PROCEDURE

A. USE STANDARD PROCEDURE FOR LOADING BINARY TAPES

4. STARTING PROCEDURE

A. LOAD AND START 200 TO ENTER NEW VECTOR AND REGISTER
   ADDRESSES; SET CONSOLE SWITCHES BEFORE TYPING 'G'.

B. LOAD AND START 204 TO BYPASS ENTRY OF NEW ADDRESSES;
   SET CONSOLE SWITCHES BEFORE TYPING 'G'.

C. DUE TO FLOATABLE VECTOR AND REGISTER USAGE, A START AT
   AT 200 MUST BE DONE ON THE INITIAL RUN. THEREAFTER
   204 MAY BE USED.

D. THE PROGRAM WILL TYPE "END OF TEST" UPON COMPLETION
   OF A SINGLE PASS AND MAY BE RESTARTED BY PRESSING
   THE CONTINUE SWITCH.

E. A POWER FAIL RESTART IS PROVIDED AND WILL TYPE A
   POWER FAIL MESSAGE BEFORE RESTARTING AT LOC 200(8).

5. CONSOLE SWITCH SETTINGS

A. THE CONSOLE SWITCHES MAY BE SET TO ANY CONFIGURATION AND ARE APPLICABLE TO ALL TESTS.
B. ANY SWITCH MAY BE CHANGED DYNAMICALLY.
C. IF NO SWITCHES ARE SET THE PROGRAM WILL RUN IN THE "NORMAL" MANNER. THE SWITCHES SHOULD BE SET FOR ANY VARIATION DESIRED.

SWITCHES:

SW 15: 1=NO ERROR PRINTS
0=PRINT ALL ERRORS

SW 14: 1=STOP ON ERROR
0=CONTINUE ON ERROR

SW 13: 1=LOOP MODE
0=SINGLE PASS

SW 12: 1=INHIBIT DATA ITERATIONS
0=DO NOT INHIBIT ITERATIONS

SW 11: 1=GO TO MAINTENANCE MODE
0=DO NOT ENTER MAINTENANCE MODE

SW 10: 1=DO ERROR BIT TEST
0=DO NOT DO ERROR BIT TEST

SW 9: 1=USE TESTER INTERRUPT FOR MAINTENANCE MODE
0=USE CONTROLLER INTERRUPT

SW 8: 1=ENTER LINE COUNT MODE (PDP-11/45 ONLY)
0=DO NOT ENTER LINE COUNT MODE

6. ERROR PRINTOUTS

A. THERE ARE THREE (3) TYPES OF ERROR PRINTOUTS:

1. ILLEGAL VECTOR OR REGISTER ENTRY
2. LOGIC TEST ERROR
3. DATA TEST ERROR

B. ANY ODD VECTOR OR REGISTER ADDRESS, OR OUT OF BOUNDS ENTRY (0-500 FOR VECTORS; 760000-777600 FOR REGISTERS) WILL RESULT IN AN ERROR PRINT AND REENTRY REQUEST, REGARDLESS OF CONSOLE SWITCH 15 SETTING.

C. ANY LOGIC ERROR WILL RESULT IN A PRINT OUT OF THE TEST NUMBER AND ENGLISH LANGUAGE DESCRIPTION OF THE ERROR.

D. ANY DATA ERROR WILL RESULT IN A PRINT OUT OF THE EXPECTED DATA AND THE RECIEVED DATA IN BIT FORMAT.

E. CONSOLE SWITCH 15 CONDITIONS ERROR PRINTOUTS.
BY SETTING SWITCH 15 TO A ONE, ALL ERROR MESSAGES
ARE INHIBITED EXCEPT FOR ENTRY OF AN ILLEGAL
VECTOR OR REGISTER ADDRESS.

F. CONSOLE SWITCH 14 CONDITIONS STOP/CONTINUE ON ERROR
IF A LOGIC TEST ERROR HALT IS ENCOUNTERED, THE
PROGRAM MAY BE RESTARTED BY PRESSING THE CONTINUE
SWITCH.
IF A DATA TEST ERROR HALT IS ENCOUNTERED, THE
PROGRAM MAY BE CONTINUED BY PRESSING THE CONTINUE
SWITCH.

7. TEST DESCRIPTIONS

A. GROUP 1: LOGIC TESTS
THIS GROUP OF 22(8) TESTS WILL CHECK ALL USABLE BITS OF
BOTH THE TESTER AND CONTROLLER STATUS REGISTERS
FOR SET AND RESET. THE ERROR BIT (15) IN THE CONTROLLER
STATUS REGISTERS ONLY SETS WHEN THE INTERFACE IS
OFF LINE, THEREFORE REQUIRING MANNUAL INTERVENTION
BY AN OPERATOR. CONSOLE SWITCH 10 CONDITIONS ENTRY
TO THIS TEST. WHEN ENTERED A MESSAGE WILL BE TYPED
REQUESTING THE INTERFACE BE PLACED 'OFF LINE', WHEN
COMPLETED ANOTHER MESSAGE WILL BE TYPED REQUESTING A RETURN
TO "ON LINE." THE ERROR BIT WILL BE CHECKED FOR
BOTH SET AND RESET.

TEST1: ASSURE THAT ALL BITS OF THE CONTROLLER STATUS REGISTER
EXCEPT READY CAN BE CLEARED. BITS 8-5 ARE NOT CHECKED
AS THEY MAY BE USED FOR INTERFACE TYPE IDENTIFICATION
AT A LATER DATE.

TEST2: ASSURE THAT ALL BITS OF THE TESTER STATUS REGISTER
EXCEPT READY CAN BE CLEARED.

TEST3: ASSURE THAT THE CONTROLLER READY BIT WAS CLEARED BY INIT.

TEST4: ASSURE THAT THE TESTER READY BIT WAS CLEARED BY INIT.

TEST5: ASSURE THAT THE CONTROLLER READY BIT REMAINS RESET WHEN
A CHARACTER IS LOADED INTO THE CONTROLLER BUFFER.

TEST6: ASSURE THAT THE TESTER READY BIT DOES SET UPON
COMPLETION OF DATA TRANSFER FROM CONTROLLER BUFFER TO
TESTER BUFFER.

TEST7: ASSURE THAT THE GO BIT OF THE TESTER STATUS REGISTER
RESETS IMMEDIATELY AFTER BEING SET.

TEST10: ASSURE THAT THE TESTER READY BIT IS NOT RESET BY
THE SETTING OF THE GO BIT.

TEST11: ASSURE THAT THE CONTROLLER READY BIT SETS AFTER THE GO BIT IS SET TO COMPLETE THE CYCLE.

TEST12: ASSURE THAT THE TESTER READY BIT IS NOT RESET AT THE END OF THE CYCLE.

TEST13: ASSURE THAT THE CONTROLLER READY BIT IS NOT RESET AT AT THE END OF THE CYCLE.

TEST14: ASSURE THAT THE TESTER INTERRUPT IS GENERATED AND RECOGNIZED AFTER COMPLETION OF A DATA TRANSFER CYCLE.

TEST15: ASSURE THAT THE CONTROLLER INTERRUPT IS GENERATED AND RECOGNIZED AT THE END OF A CYCLE.

TEST16: ASSURE THAT THE TESTER INTERRUPT WILL NOT BE RECOGNIZED WHEN THE INTERRUPT ENABLE BIT IS NOT SET.

TEST17: ASSURE THAT THE TESTER INTERRUPT WILL NOT BE RECOGNIZED AT A PRIORITY LEVEL ABOVE FOUR (4).

TEST20: ASSURE THAT THE CONTROLLER INTERRUPT IS NOT RECOGNIZED WHEN THE INTERRUPT ENABLE BIT IS NOT SET.

TEST21: ASSURE THAT THE CONTROLLER INTERRUPT IS NOT RECOGNIZED AT A PRIORITY LEVEL ABOVE FOUR (4).

TEST22: THIS TEST, ENTERED VIA CONSOLE SWITCH TEN (10),WILL CHECK THE ERROR STATUS BIT, BIT FIFTEEN (15), FOR THE PROPER STATE IN EACH MODE OF THE INTERFACE. OPERATOR INTERVENTION WILL BE REQUESTED ON THE TELETYPE TO SET THE MODE SWITCHES ON THE INTERFACE TO EACH OF THE FOUR STATES:

1. ON LINE = NORMAL MODE: BIT 15 = 0
2. OFF LINE = NORMAL MODE: BIT 15 = 1
3. OFF LINE = TEST MODE: BIT 15 = 1
4. ON LINE = TEST MODE: BIT 15 = 1

;. GROUP 2: DATA TESTS
THIS GROUP OF 2 TESTS WILL PERFORM DATA CHECKS BY WRAPPING DATA AROUND FROM THE CONTROLLER BUFFER TO THE TESTER BUFFER AND COMPARING FOR ERRORS.

TEST 1: WRAP = PATTERNS OF ALL ZEROS, ALL ONES, A ZERO WALKING FROM RIGHT TO LEFT IN A FIELD OF ONES, AND A ONE WALKING FROM RIGHT TO LEFT IN A FIELD OF ZEROS. THE DATA CAN BE OBSERVED IN THE INDICATOR LIGHTS ON THE INTERFACE PANEL.

TEST 2: WRAP PATTERNS OF ALL POSSIBLE COMBINATIONS OF THE 8 BIT CHARACTER (0 - 377).

THE PATTERNS IN TEST 1 ARE EACH REPEATED 512 TIMES AND EACH SET OF ALL BIT COMBINATIONS IS REPEATED 6 TIMES IN TEST 2. THESE ITERATIONS MAY BE INHIBITED VIA CONSOLE SWITCH 12.

C. GROUP 3: MAINTENANCE MODE
THIS GROUP, ENTERED VIA CONSOLE SWITCH 11, WILL RUN CONTINUOUSLY AND SHOULD BE USED FOR DEBUGGING AND DELAY ADJUSTMENTS. A FULL CYCLE OF DATA WRAP AND INTERRUPT AT END OF CYCLE IS PERFORMED.
THE INTERRUPT RECOGNIZED, TESTER OR CONTROLLER, IS VARIABLE DYNAMICALLY VIA CONSOLE SWITCH 9. THE INTERRUPT ENABLE INDICATERS ON THE INTERFACE PANEL WILL SHOW WHICH IS BEING USED. DATA IS TAKEN FROM CONSOLE SWITCHES 0-7 AND MAY BE VARIED DYNAMICALLY. THE DATA IS COMPLEMENTED ON EVERY OTHER PASS TO PROVIDE TRANSITIONS IN THE LOGIC.

D. GROUP 4: LINE COUNT MODE
THIS GROUP, ENTERED VIA CONSOLE SWITCH EIGHT (8), WILL COUNT THE NUMER OF CHARACTERS TRANSMITTED IN ONE SECOND AND DIVIDE THIS NUMBER BY 37 IN ORDER TO PROVIDE A PRINTOUT OF THE NUMBER OF LINES PER SECOND.
THE TEST WILL ONLY RUN ON A PDP-11/45 WITH A KL11-L LINE CLOCK.
AS LONG AS SWITCH 8 IS SET TO A ONE, THE TEST WILL CONTINUE TO RUN WITH A PRINTOUT APPROXIMATLY EVERY SECOND.
CONSOLE SWITCH 13 (CONTINUOUS OR SINGLE PASS) WILL HAVE FULL USE DURING THIS TEST; HOWEVER, NO OTHER SWITCHES ARE USED.

E. LISTING

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                        .TITLE LPC11
                        .ABS

                        ;LPC11 INTERFACE TEST
                        ;MAINDEC-11-DZLPB-B-D
                        ;FEBRUARY 25, 1973
                        ;DIGITAL EQUIPMENT CORP. MAYNARD MASS.
                        ;PROGRAMMER P. B. BARNES

                        ;************************
                        ;CONSOLE SWITCH SETTINGS
                        ;
                        ;SW 15: 1=NO ERROR PRINT
                        ;       0=PRINT ALL ERRORS
                        ;
                        ;SW 14: 1=STOP ON ERROR
                        ;       0=CONTINUE
                        ;
                        ;SW 13: 1=CONTINUE MODE
                        ;       0=1 PASS ONLY
                        ;
                        ;SW 12: 1=INHIBIT ITERATIONS
                        ;       0=NORMAL TEST
                        ;
                        ;SW 11: 1=MAINTENANCE MODE
                        ;       0=NORMAL MODE
                        ;
                        ;SW 10: 1=DO ERROR BIT TEST
                        ;       0=NO ERROR BIT TEST
                        ;
                        ;SW  9: 1=USE TESTER INTERRUPT IN MAINTENANCE MODE
                        ;       0=USE CONTROLLER INTERRUPT
                        ;
                        ;SW  8: 1=ENTER LINE COUNT MODE (PDP-11/45 ONLY)
                        ;       0=DO NOT ENTER LINE COUNT MODE
                        ;************************
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```
                                        ;REGISTER EQUIVS
                                        ;
            000000                      R0=%0
            000001                      R1=%1
            000002                      R2=%2
            000003                      R3=%3
            000004                      R4=%4
            000005                      R5=%5
            000006                      SP=%6
            000007                      PC=%7
                                        ;
                                        ;TRAP CATCHERS 0-1000
                                        ;
            000000                      .=0
                                        .REPT 200
                                        .+2
                                        HALT
                                        .ENDR
                                        ;
                                        ;POWER FAIL VECTOR
                                        ;
            000024                      .=24
000024  005352                          PWRFAL
000026  000340                          340
                                        ;
                                        ;LINE CLOCK VECTOR
                                        ;
            000100                      .=100
000100  004224                          TINT
000102  000340                          340
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                                        ;*****************************************
                                        ;PROGRAM START LOCATIONS:
                                        ;
                                        ;200 = INPUT VECTOR AND REGISTER ADDRESSES AT START
                                        ;204 = USE PREVIOUSLY SET ADDRESSES
                                        ;
                                        ;VECTORS AND REGISTER ADDRESSES MUST BE
                                        ;INPUT ON THE INITIAL RUN.
                                        ;ON ALL OTHER RUNS, THE PREVIOUSLY SET
                                        ;ADDRESSES MAY BE USED.
                                        ;*****************************************

            000200                      .=200
000200  000167  001002                  JMP     PBEG            ;GO TO START AND SET VECTOR / REGISTERS

            000204                      .=204
000204  000167  000770                  JMP     PSKIP           ;GO TO START BUT DO NOT SET ADDRESSES
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                                .=1000

                                ;FLAGS AND COUNTERS

001000  000000          PVEC:   0               ;VECTOR POINTER SAVE
001002  000000          PREG:   0               ;REGISTER POINTER SAVE
001004  000000          PTN:    0               ;TEST NUMBER STORAGE
001006  000000          PSPS:   0               ;STACK POINTER SAVE LOC
001010  000000          PITA:   0               ;INTERRUPT RETURN STORAGE
001012  000000          PGOF:   0               ;GO FLAG
001014  000000          PTIM1:  0               ;TIMER
001016  000000          PTIM2:  0               ;GROSS TIMER
001020  000000          PIC:    0               ;ITERATION CNTR
001022  000000          PCHAR:  0               ;TEST CHAR TEMP STORAGE
001024  000000          TOB:    0               ;TTY OUTPUT BUFFER STORAGE
001026  000000          TIB:    0               ;TTY INPUT BUFFER STORAGE
001030  000000          ROTA:   0               ;ROTATION FACTOR
001032  000000          PINTR:  0               ;INTERRUPT RETURN POINTER
001034  000000          PLT:    0               ;ERROR BIT TEMP STORAGE

                                ;ADDRESS CONSTANTS

001036  177560          TKS:    177560          ;TTY STATUS
001040  177562          TKB:    177562          ;TTY BUFFER
001042  177564          TPS:    177564          ;TTP STATUS
001044  177566          TPB:    177566          ;TTP BUFFER
001046  177546          LKS:    177546          ;LINE CLOCK REGISTER
001050  177570          SWR:    177570          ;CONSOLE SWITCH REGISTER
001052  177776          PSW:    177776          ;PROGRAM STATUS WORD
001054  000000          PCS:    0               ;PACESETTER STATUS
001056  000000          PCB:    0               ;PACESETTER BUFFER
001060  000000          PTS:    0               ;TEST STATUS
001062  000000          PTB:    0               ;TEST BUFFER
```

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                                        .=1200
                                        ;*********************************
                                        ;PROGRAM START
                                        ;
                                        ;THIS IS THE HOUSE KEEPING ROUTINE
                                        ;WHICH CLEARS ALL COUNTERS AND FLAGS
                                        ;TYPES THE PROGRAM NAME, SETS UP
                                        ;REGISTERS AND VECTOR ADDRESSES, ASSUMES
                                        ;THAT THE LPC11 INTERFACE IS IN THE PROPER
                                        ;MODE, AND CHECKS FOR MAINTENANCE MODE.
                                        ;*********************************

                                        ;CLEAR COUNTERS AND FLAGS

001200  012702  000001          PSKIP:  MOV     #1,R2           ;SET SKIP FLAG
001204  000401                          BR      PSTART          ;GO TO START
001206  005002                  PNEG:   CLR     R2              ;RESET SKIP FLAG
001210  012706  000500          PSTART: MOV     #500,SP         ;SET STACK POINTER
001214  012777  000340  177630          MOV     #340,@#PSW      ;SET PSW
001222  000005                          RESET                   ;RESET AT START OR RESTART
001224  005000                          CLR     R0
001226  005300                          DEC     R0
001230  001376                          BNE     .-2             ;DELAY FOR RESET
001232  012701  000014                  MOV     #14,R1          ;R1=NUMBER OF LOCATIONS TO CLEAR
001236  012700  001034                  MOV     #PET,R0         ;R0=START ADDR
001242  005010                          CLR     @R0
001244  005040                  PCLR:   CLR     -(R0)           ;CLEAR ALL COUNTERS
001246  005301                          DEC     R1
001250  001375                          BNE     PCLR            ;CONTINUE UNTIL DONE
001252  005702                          TST     R2              ;SEE IF SHOULD GET ADDRS
001254  001137                          BNE     PSMC            ;IF NOT; BR

                                        ;PRINT PROGRAM NAME

001256  012704  005535                  MOV     #MSG1,R4
001262  004767  003516                  JSR     PC,TTOUT        ;TYPE PROGRAM NAME
001266  012704  005564                  MOV     #MSG2,R4

                                        ;GET NEW VECTOR ADDRESS

001272  004767  003506                  JSR     PC,TTOUT        ;TYPE VECTOR REQUEST
001276  012704  001000          PV1:    MOV     #PVEC,R4        ;R4=VECTOR STORAGE ADDR
001302  012703  000003                  MOV     #3,R3           ;R3=INPUT CHAR NUMBER
001306  012767  000003  177514          MOV     #3,ROTA         ;ROTA=ROTATION FACTOR
001314  012705  177770                  MOV     #177770,R5      ;R5=MASK
001320  004767  003550                  JSR     PC,READ         ;GO READ IN VECTOR
001324  032767  000001  177466          BIT     #1,PVEC         ;TEST FOR ODD ADDR
001332  001004                          BNE     PVE             ;IF ODD; BR
001334  022767  000500  177436          CMP     #500,PVEC       ;TEST FOR TOO HIGH
001342  101005                          BHI     PNG             ;IF OK; BR
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K1

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                                        ;GET NEW REGISTER ADDRESS
                                        ;
001356  012704  005660          PRG:    MOV     #MSG4,R4
001362  004767  003416                  JSR     PC,TTOUT        ;TYPE REGISTER ADDR REQUEST
001366  012704  001002          PRG1:   MOV     #PREG,R4
001372  012703  000006                  MOV     #6,R3
001376  012767  000003  177424          MOV     #3,NOTA
001404  012705  177770                  MOV     #177770,R5
001410  004767  003466                  JSR     PC,READ         ;GO READ STARTING REGISTER ADDR
001414  032767  000001  177360          BIT     #1,PREG         ;TEST FOR ODD ADDR
001422  001010                          BNE     PREGE           ;IF ODD: BR
001424  022767  160000  177350          CMP     #160000,PREG    ;TEST FOR TOO LOW
001432  101004                          BMI     PREGE           ;IF TOO LOW: BR
001434  022767  177600  177340          CMP     #177600,PREG    ;TEST FOR TOO HIGH
001442  101005                          BMI     PSET            ;IF NOT TO HIGH: BR
001444  012704  005722          PREGE:  MOV     #MSG5,R4
001450  004767  003330                  JSR     PC,TTOUT        ;TYPE ILLEGAL REGISTER ADDR
001454  000744                          BR      PRG1            ;TRY AGAIN
001456  016700  177320          PSET:   MOV     PREG,R0         ;SET P. S. STATUS ADDR IN R0
001462  012701  001054                  MOV     #PCS,R1         ;R1=PACESETTER STATUS ADDR
                                        .REPT 4
                                        MOV     R0,(R1)+        ;SET REGISTERS
                                        ADD     #2,R0
                                        .ENDR
                                        ;REQUEST ON LINE/TEST MODE
001516  012704  005760                  MOV     #MSG6,R4
001522  004767  003256                  JSR     PC,TTOUT        ;REQUEST ON LINE/TEST MODE
001526  012704  001012                  MOV     #PGOF,R4
001532  012703  000001                  MOV     #1,R3
001536  012767  000003  177264          MOV     #3,NOTA
001544  012705  177770                  MOV     #177770,R5      ;SET MASK
001550  004767  003326                  JSR     PC,READ         ;AWAIT GO COMMAND
                                        ;MAINTENANCE MODE CHECK
001554  032777  004000  177266  PSMC:   BIT     #4000,@SWR      ;LOOK FOR MAINTENANCE MODE BIT
001562  001402                          BEQ     PLCC            ;IF NOT: BR
001564  000167  002074                  JMP     PSCOP           ;ELSE GO TO MAINTENANCE MODE
                                        ;LINE COUNT MODE ENTRY CHECK
001570  032777  000400  177252  PLCC:   BIT     #400,@SWR       ;SEE IF SHOULD ENTER LINE COUNT MODE
001576  001402                          BEQ     PT1             ;IF NOT: BR
001600  000167  002306                  JMP     PLC             ;ELSE GO TO LINE COUNT MODE
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                                        ;**************************************
                                        ;GROUP 1: LOGIC TESTS
                                        ;
                                        ;THIS GROUP CONSISTS OF 22(8) TESTS TO
                                        ;ASSURE THAT ALL FUNCTIONS OF EACH USABLE
                                        ;BIT IN BOTH THE TESTER AND THE CONTROLLER
                                        ;STATUS REGISTERS WILL SET AND RESET FROM
                                        ;PROPER CONDITIONS AND IN THE PROPER SEQUENCE.
                                        ;THE INTERRUPT SYSTEM OF BOTH THE TESTER
                                        ;AND CONTROLLER IS ALSO TESTED TO ASSURE
                                        ;THAT EACH WILL MAP TO THE PROPER VECTOR
                                        ;AND PRIORITY LEVEL.
                                        ;**************************************

                                        ;LOGIC TEST 01: CLEAR CONT STATUS

001604  005077  177244        PT1:    CLR     @PCS            ;CLEAR CONT STATUS
001610  005077  177244                CLR     @PTS            ;CLEAR TESTER STATUS
001614  012767  030460  177162        MOV     #30460,PTN      ;SAVE TEST NO.
001622  004767  003500                JSR     PC,PRSTV        ;RESET VECTORS
001626  032777  077500  177220        BIT     #77500,@PCS     ;LOOK FOR CLEAR
001634  001404                        BEQ     PT1A1           ;IF OK: BR
001636  012703  006276                MOV     #MSG13,R3       ;SET ERROR MSG ADDR
001642  000167  002450                JMP     PLE             ;GO TYPE ERROR

                                        ;LOGIC TEST 02: CLEAR TESTER STATUS

001646  012767  031060  177130  PT1A1:  MOV     #31060,PTN      ;SAVE TEST NO.
001654  032777  077577  177176        BIT     #77577,@PTS     ;LOOK FOR CLEAR
001662  001404                        BEQ     PT1A1A          ;IF OK: BR
001664  012703  006241                MOV     #MSG14,R3       ;SET ERROR MSG ADDR
001670  000167  002422                JMP     PLE             ;GO TYPE ERROR MSG

                                        ;LOGIC TEST 03: CONT READY RESET FROM INIT

001674  012767  031460  177102  PT1A1A: MOV     #31460,PTN      ;SAVE TEST NO.
001702  032777  000200  177144        BIT     #200,@PCS       ;LOOK FOR CONT READY RESET
001710  001404                        BEQ     PT1A1B          ;IF OK: BR
001712  012703  007573                MOV     #MSG41,R3       ;SET ERROR MSG ADDR
001716  000167  002374                JMP     PLE             ;GO TO ERROR ROUTINE

                                        ;LOGIC TEST 04: TESTER READY RESET FROM INIT

001722  012767  032060  177054  PT1A1B: MOV     #32060,PTN      ;SAVE TEST NO.
001730  032777  000200  177122        BIT     #200,@PTS       ;LOOK FOR TESTER READY RESET
001736  001404                        BEQ     PT1A2           ;IF OK: BR
001740  012703  007632                MOV     #MSG42,R3       ;SET ERROR MSG ADDR
001744  000167  002346                JMP     PLE             ;GO TO ERROR ROUTINE

                                        ;LOGIC TEST 05: CONT READY RESET FROM CHAR LOAD

001750  012767  032460  177026  PT1A2:  MOV     #32460,PTN      ;SAVE TEST NO.
001756  012777  000000  177072        MOV     #0,@PCB         ;CLEAR BUFFER
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M1

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                                                ;LOOK FOR READY
002764  032777  000200  177062                  BIT     #200,@PCS
002770  001404                                  BEQ     PT1A3           ;IF OK: BR
002772  012703  006337                          MOV     #MSG14,R3       ;SET ERROR MSG ADDR
003000  000167  002312                          JMP     PLE             ;GO TYPE ERROR MSG

                                                ;LOGIC TEST 06: TESTER READY SET AFTER CHAR LOAD

003004  012767  033060  176772  PT1A3:          MOV     #33060,PTN      ;SAVE TEST NO.
003012  005067  176770                          CLR     PTIM1           ;SET TIMER
003016  005367  176772          PT1A3A: DEC     PTIM1           ;DELAY
003022  001375                                  BNE     PT1A3A
003024  032777  000200  177026                  BIT     #200,@PTS       ;LOOK FOR TESTER READY
003032  001004                                  BNE     PT1A4           ;IF OK: BR
003034  012703  006411                          MOV     #MSG15,R3       ;SET ERROR MSG ADDR
003040  000167  002252                          JMP     PLE             ;GO TYPE ERROR MSG

                                                ;LOGIC TEST 07: ASSURE GO BIT RESET

003044  012767  034060  176732  PT1A4:          MOV     #34060,PTN      ;SAVE TEST NO.
003052  005277  177002                          INC     @PTS            ;SET GO
003056  012767  000100  176730                  MOV     #100,PTIM1      ;SET TIME
003064  005367  176724          PT1A:   DEC     PTIM1           ;DELAY
003070  001375                                  BNE     PT1A
003072  032777  000001  176760                  BIT     #1,@PTS         ;LOOK FOR GO RESET
003100  001404                                  BEQ     PT1B1           ;IF OK: BR
003102  012703  006460                          MOV     #MSG16,R3       ;SET ERROR MSG ADDR
003106  000167  002204                          JMP     PLE             ;GO TYPE ERROR MSG

                                                ;LOGIC TEST 10: TESTER READY NOT RESET BY GO

003112  012767  030061  176664  PT1B1:          MOV     #30061,PTN      ;SAVE TEST NO.
003120  032777  000200  176732                  BIT     #200,@PTS       ;LOOK FOR TESTER READY NOT RESET
003126  001004                                  BNE     PT1B2           ;IF OK: BR
003130  012703  006510                          MOV     #MSG17,R3       ;SET ERROR MSG ADDR
003134  000167  002156                          JMP     PLE             ;GO TYPE ERROR MSG

                                                ;LOGIC TEST 11: CONT  READY SET FROM GO

003140  012767  030461  176636  PT1B2:          MOV     #30461,PTN      ;SAVE TEST NO.
003146  005067  176642                          CLR     PTIM1           ;SET TIMER
003152  005367  176636          PT1B2A: DEC     PTIM1           ;DELAY
003156  001375                                  BNE     PT1B2A
003160  032777  000200  176666                  BIT     #200,@PCS       ;LOOK FOR CONT READY SET
003166  001004                                  BNE     PT1B3           ;IF OK: BR
003170  012703  006546                          MOV     #MSG20,R3       ;SET ERROR MSG ADDR
003174  000167  002116                          JMP     PLE             ;GO TYPE ERROR MSG

                                                ;LOGIC TEST 12: TESTER READY AT END OF CYCLE

003200  012767  032601  176576  PT1B3:          MOV     #32601,PTN      ;SAVE TEST NO.
003206  012777  000000  176642                  MOV     #0,@PCW         ;LOAD CHAR
003214  005067  176574                          CLR     PTIM1           ;SET TIME
003220  005367  176570          PT1B:   DEC     PTIM1           ;DELAY
003224  001375                                  BNE     PT1B
```

```
346  002226  032777  000200  176624          BIT     #200,@PTS       ;LOOK FOR TESTER READY
347  002234  001004                          BNE     PT1C            ;IF OK: BR
348  002236  012703  006611                  MOV     #MSG21,R3       ;SET ERROR MSG ADDR
349  002242  000167  002050                  JMP     PLE             ;GO TYPE ERROR MSG
350
351                                          ;LOGIC TEST 13: CONT READY RESET AT END OF CYCLE
352
353  002246  012767  031461  176530  PT1C:   MOV     #31461,PTN      ;SAVE TEST NO.
354  002254  005367  176534                  DEC     PTIM1
355  002260  001372                          BNE     PT1C            ;DELAY
356  002262  032777  000200  176564          BIT     #200,@PCS       ;LOOK FOR CONT READY
357  002270  001404                          BEQ     PT1E            ;IF OK: BR
358  002272  012703  006660                  MOV     #MSG22,R3       ;SET ERROR MSG ADDR
359  002276  000167  002014                  JMP     PLE             ;GO TYPE ERROR MSG
360
361                                          ;LOGIC TEST 14: TESTER INTERRUPT
362
363  002302  012767  031461  176474  PT1E:   MOV     #31461,PTN      ;SAVE TEST NO.
364  002310  005077  176544                  CLR     @PTS            ;CLEAR TESTER
365  002314  005077  176534                  CLR     @PCS            ;CLEAR CONTROLLER
366  002320  016700  176454                  MOV     PVEC,R0         ;R0 = STARTING VECTOR
367  002324  022020                          CMP     (R0)+,(R0)+     ;POINT TO TESTER VECTOR
368  002326  012720  005236                  MOV     #PINT,(R0)+     ;SET VECTOR ADDR
369  002332  012720  000340                  MOV     #340,(R0)+      ;SET PSW
370  002336  052777  000100  176514          BIS     #100,@PTS       ;SET TESTER INTERRUPT ENABLE
371  002344  005067  176444                  CLR     PTIM1           ;SET TIME
372  002350  012767  000010  176440          MOV     #10,PTIM2       ;SET TIME
373  002356  012767  002422  176446          MOV     #PT1FA,PINTR    ;SET RETURN
374  002364  005077  176462                  CLR     @PSW            ;SET PSW TO LOWEST PRIORITY
375  002370  012777  000000  176460          MOV     #0,@PCB         ;LOAD CHAR
376  002376  005367  176412          PT1F:   DEC     PTIM1           ;DELAY
377  002402  001375                          BNE     PT1F
378  002404  005367  176406                  DEC     PTIM2           ;DELAY
379  002410  001372                          BNE     PT1F
380  002412  012703  006727                  MOV     #MSG24,R3       ;SET ERROR MSG ADDR
381  002416  000167  001674                  JMP     PLE             ;GO TYPE ERROR MSG
382
383                                          ;LOGIC TEST 15: CONT INTERRUPT
384
385  002422  012767  032461  176354  PT1FA:  MOV     #32461,PTN      ;SAVE TEST NO.
386  002430  005077  176424                  CLR     @PTS            ;CLEAR TESTER INT ENABLE
387  002434  005067  176354                  CLR     PTIM1
388  002440  005367  176350          PT1FB:  DEC     PTIM1
389  002444  001375                          BNE     PT1FB           ;AWAIT COMPLETE FROM TESTER INTERRUPT
390  002446  005367  176342          PT1FC:  DEC     PTIM1
391  002452  001375                          BNE     PT1FC
392  002454  004767  002646                  JSR     PC,PRSTV        ;RESET VECTORS
393  002460  016700  176314                  MOV     PVEC,R0         ;R0 = STARTING VECTOR
394  002464  012720  005236                  MOV     #PINT,(R0)+     ;SET VECTOR ADDR
395  002470  012720  000340                  MOV     #340,(R0)+      ;SET PSW
396  002474  052777  000100  176352          BIS     #100,@PCS       ;SET CONT INTERRUPT ENABLE
397  002502  012767  000010  176306          MOV     #10,PTIM2       ;SET TIME
398  002510  012767  002552  176314          MOV     #PT1H,PINTR     ;SET RETURN
399  002516  005077  176330                  CLR     @PSW            ;SET PSW TO LOWEST PRIORITY
```

```
 400  002522  005277  176332                INC     @PTS            ;SET GO
 401  002526  005367  176262        PT1G:   DEC     PTIM1
 402  002532  001375                        BNE     PT1G            ;DELAY
 403  002534  005367  176256                DEC     PTIM2
 404  002540  001372                        BNE     PT1G            ;DELAY
 405  002542  012703  006770                MOV     #MSG29,R3       ;SET ERROR MSG ADDR
 406  002546  000167  001544                JMP     PLE             ;GO TYPE ERROR MSG
 407
 408                                        ;LOGIC TEST 16: TESTER INT ENABLE OFF
 409
 410  002552  012767  033061  176224  PT1M: MOV     #33061,PTN      ;SAVE TEST NO.
 411  002560  005077  176270                CLR     @PCS
 412  002564  005077  176270                CLR     @PTS
 413  002570  005005                        CLR     R5              ;CLEAR FLAG
 414  002572  012767  002704  176210        MOV     #PT1M,PITA      ;SET POINTER
 415  002600  012704  002674                MOV     #PT1L,R4        ;SET RETURN ADDRESS
 416  002604  005003                        CLR     R3
 417  002606  016700  176166                MOV     PVEC,R0         ;R0=STARTING VECTOR ADDRESS
 418  002612  022020                        CMP     (R0)+,(R0)+     ;POINT TO TESTER VECTOR
 419  002614  012720  005224        PT1MA:  MOV     #PINTS,(R0)+    ;SET VECTOR TO SERVICE ROUTINE
 420  002620  012720  000340                MOV     #340,(R0)+      ;SET PSW TO PRIORITY 7
 421  002624  010467  176202        PT1MB:  MOV     R4,PINTR        ;SET INTERRUPT RETURN
 422  002630  010377  176216                MOV     R3,@PSW         ;SET PSW
 423  002634  005067  176154                CLR     PTIM1           ;CLEAR TIMER
 424  002640  012777  000000  176210        MOV     #0,@PCB         ;LOAD CHAR
 425  002646  005367  176142        PT1J:   DEC     PTIM1
 426  002652  001375                        BNE     PT1J            ;DELAY
 427  002654  005367  176134        PT1K:   DEC     PTIM1
 428  002660  001375                        BNE     PT1K            ;DELAY
 429  002662  012777  000340  176162        MOV     #340,@PSW       ;RESET PSW TO PRIORITY 7
 430  002670  000177  176114                JMP     @PITA           ;CONTINUE TO NEXT TEST
 431  002674  012703  007246        PT1L:   MOV     #MSG34,R3       ;TYPE ERROR
 432  002700  000167  001412                JMP     PLE
 433
 434                                        ;LOGIC TEST 17: TESTER INT AT HIGHER LEVEL
 435
 436  002704  012767  033461  176072  PT1M: MOV     #33461,PTN      ;SAVE TEST NO.
 437  002712  005077  176144                CLR     @PTB
 438  002716  005077  176136                CLR     @PTS
 439  002722  005077  176126                CLR     @PCS
 440  002726  005705                        TST     R5              ;SEE IF TESTER COMPLETE
 441  002730  001025                        BNE     PT1P            ;IF SO:BR
 442  002732  005205                        INC     R5              ;SET FLAG
 443  002734  005367  176054        PT1M1:  DEC     PTIM1
 444  002740  001375                        BNE     PT1M1           ;DELAY
 445  002742  005077  176110                CLR     @PCB            ;LOAD CHAR
 446  002746  052777  000100  176104        BIS     #100,@PTS       ;SET TESTER INTERRUPT ENABLE
 447  002754  012777  000200  176070        MOV     #200,@PSW       ;PSW SETTING = PRIORITY 4
 448  002762  012767  002774  176042        MOV     #PT1N,PINTR     ;LOAD RETURN ADDRESS
 449  002770  000167  177652                JMP     PT1J            ;DELAY FOR INTERRUPT
 450  002774  012703  007323        PT1N:   MOV     #MSG35,R3
 451  003000  000167  001312                JMP     PLE             ;GO TO ERROR ROUTINE
 452
```

C2

```
                                                ;LOGIC TEST 20: CONT INT ENABLE OFF
                                                ;
003004  012767  030062  175772  PT1P:  MOV     #30062,PTN       ;SAVE TEST NO.
003012  005077  176044                 CLR     @PTB
003016  005077  176036                 CLR     @PTS
003022  005077  176026                 CLR     @PCS
003026  005005                         CLR     R5               ;CLEAR FLAG
003030  016700  175744                 MOV     PVEC,R0          ;R0=VECTOR ADDRESS
003034  005003                         CLR     R3               ;R3=PSW
003036  012704  003104                 MOV     #PT1R,R4         ;R4=INTERRUPT RETURN ADDR
003042  012767  003114  175740         MOV     #PT1B,PITA       ;SET CONTINUE ADDR
003050  012720  005224                 MOV     #PINTS,(R0)+     ;SET VECTOR ADDR
003054  012720  000340                 MOV     #340,(R0)+       ;SET PSW
003060  010467  175746          PT1Q:  MOV     R4,PINTR         ;SET RETURN ADDR
003064  010377  175762                 MOV     R3,@PSW          ;SET PSW
003070  005067  175720                 CLR     PTIM1            ;SET TIMER
003074  005277  175760                 INC     @PTS             ;SET GO
003100  000167  177542                 JMP     PT1J             ;TEST CONT INTERRUPT
003104  012703  007376          PT1R:  MOV     #MSG36,R3
003110  000167  001202                 JMP     PLE              ;GO TO ERROR ROUTINE
                                                ;
                                                ;LOGIC TEST 21: CONT INT AT HIGHER LEVEL
                                                ;
003114  012767  030462  175662  PT1S:  MOV     #30462,PTN       ;SAVE TEST NO.
003122  005077  175734                 CLR     @PTB
003126  005077  175726                 CLR     @PTS
003132  005077  175716                 CLR     @PCS
003136  005705                         TST     R5               ;SEE IF DONE BOTH TESTS
003140  001016                         BNE     PEBT             ;IF SO:BR
003142  005205                         INC     R5               ;SET FLAG
003144  052777  000100  175702         BIS     #100,@PCS        ;SET CONTROLLER INTERRUPT ENABLE
003152  012703  000200                 MOV     #200,R3          ;SET PSW
003156  012704  003166                 MOV     #PT1T,R4         ;SET INTERRUPT RETURN ADDR
003162  000167  177672                 JMP     PT1Q             ;TEST CONTROLLER
003166  012703  007457          PT1T:  MOV     #MSG37,R3
003172  000167  001120                 JMP     PLE              ;GO TO ERROR ROUTINE
                                                ;
                                                ;LOGIC TEST22: ERROR BIT SET AND RESET
                                                ;
003176  012767  031062  175600  PEBT:  MOV     #31062,PTN       ;SAVE TEST NUMBER
003204  004767  002116                 JSR     PC,PRSTV         ;RESET VECTORS.
003210  032777  002000  175632         BIT     #2000,@SWR       ;SEE IF ERROR BIT TEST
003216  001002                         BNE     PEBT0            ;IF SO: BR
003220  000167  000150                 JMP     PDAT             ;ELSE GO TO DATA TEST
003224  005067  175604          PEBT0: CLR     PET              ;TEST FOR RESET
003230  012704  007720                 MOV     #MSG44,R4        ;REQUEST ON LINE - NORMAL MODE
003234  004767  000052                 JSR     PC,PEBT1
003240  012767  100000  175566         MOV     #100000,PET      ;TEST FOR SET
003246  012704  010061                 MOV     #MSG45,R4        ;REQUEST OFF LINE - NORMAL MODE
003252  004767  000034                 JSR     PC,PEBT1
003256  012704  006131                 MOV     #MSG11,R4        ;REQUEST OFF LINE - TEST MODE
003262  004767  000024                 JSR     PC,PEBT1
003266  012704  005760                 MOV     #MSG6,R4         ;REQUEST ON LINE - TEST MODE
```

```
   506  003272  004767  000014                    JSR     PC,PRNT1
   509  003276  012704  010174                    MOV     #MSG46,R4
   510  003302  004767  001476                    JSR     PC,TTOUT        ;TYPE ERROR BIT OK
   511  003306  000167  000062                    JMP     PDAT            ;GO TO DATA TEST
   512  003312  004767  001466          PEBT11:   JSR     PC,TTOUT        ;TYPE MSG
   513  003316  016704  175470                    MOV     PGOP,R4
   514  003322  012703  000001                    MOV     #1,R3
   515  003326  012767  000003  175474            MOV     #3,MOTA
   516  003334  012705  177770                    MOV     #177770,R5
   517  003340  004767  001536                    JSR     PC,READ         ;AWAIT GO REPLY
   518  003344  017700  175504          PEBT12:   MOV     @PCS,R0         ;SAVE CONTROLLER STATUS
   519  003350  042700  077777                    BIC     #77777,R0       ;MASK ERROR BIT
   520  003354  020067  175454                    CMP     R0,PET          ;SEE IF ERROR BIT IN PROPER STATE
   521  003360  001404                            BEQ     PEBT3           ;IF SO: BR
   522  003362  012703  007035                    MOV     #MSG26,R3
   523  003366  000167  000724                    JMP     PLE             ;GO TYPE ERROR MSG
   524  003372  000207                  PEBT3:    RTS     PC
   525
```

```
                                        ;*************************************
                                        ;GROUP 2: DATA TESTS
                                        ;
                                        ;THIS GROUP CONSISTS OF TWO TESTS TO
                                        ;ASSURE THAT ALL COMBINATIONS OF DATA
                                        ;CAN BE WRAPPED AROUND FROM CONTROLLER
                                        ;BUFFER TO TESTER BUFFER.
                                        ;TEST 1 WRAPS ALL ONES, ALL ZEROS, A
                                        ;WALKING ONE IN A FIELD OF ZEROS, AND
                                        ;A WALKING ZERO IN A FIELD OF ONES.
                                        ;TEST 2 WRAPS ALL POSSIBLE BIT COMBINATIONS
                                        ;OF THE 8 BIT CHARACTER.
                                        ;EACH TEST PATTERN IN TEST ONE WILL BE
                                        ;REPEATED 512 TIMES; EACH ALL BIT COMBINATION
                                        ;IN TEST TWO WILL BE REPEATED 6 TIMES.
                                        ;TO PREVENT REPETITION OF OP PATTERNS
                                        ;USE CONSOLE SWITCH 12.
                                        ;*************************************


                                        ;DATA TEST 1: ONES AND ZEROS WALK

003374  012701  005660          PDAT1:  MOV     #PPATS,R1       ;R1=START OF DATA TABLE
003400  012767  001000  175412  PDAT0:  MOV     #1000,PIC
003406  005077  175442                  CLR     @PCS
003412  005077  175442                  CLR     @PTS
003416  005077  175440                  CLR     @PTB
003422  005067  175374                  CLR     PCHAR
003426  022701  005510                  CMP     #PPATE,R1       ;LOOK FOR END OF DATA TABLE
003432  001437                          BEQ     PDAT4           ;IF SO:BR
003434  112167  175362                  MOVB    (R1)+,PCHAR     ;SET CHAR
003440  116777  175356  175410  PDAT1:  MOVB    PCHAR,@PCB      ;SET BUFFER
003446  005067  175342                  CLR     PTIM1           ;SET TIMER
003452  032777  000200  175400  PDAT2:  BIT     #200,@PTS       ;AWAIT TESTER READY
003460  001005                          BNE     PDAT2A          ;IF HAVE: BR
003462  005367  175326                  DEC     PTIM1           ;DELAY
003466  001371                          BNE     PDAT2
003470  000167  000100                  JMP     PDAT7A          ;TYPE ERROR
003474  117700  175362          PDAT2A: MOVB    @PTB,R0         ;R0=INPUT CHAR
003500  120067  175316                  CMPB    R0,PCHAR        ;COMPARE INPUT/OUTPUT
003504  001402                          BEQ     PDAT3           ;IF OK: BR
003506  004767  000672                  JSR     PC,PDE          ;GO TYPE ERROR
003512  032777  010000  175330  PDAT3:  BIT     #10000,@SWR     ;LOOK FOR INHIBIT ITERATIONS
003520  001327                          BNE     PDAT0           ;IF SO: BR
003522  005367  175272                  DEC     PIC             ;DECREMENT ITERATION COUNTER
003526  001344                          BNE     PDAT1           ;IF NOT DONE: BR
003530  000723                          BR      PDAT0           ;ELSE GET NEXT PATTERN

                                        ;DATA TEST 2: ALL CHARACTERS

003532  012767  000006  175260  PDAT4:  MOV     #6,PIC          ;SET ITERATION CNTR
003540  005067  175256          PDAT5:  CLR     PCHAR
003544  016777  175252  175304  PDAT6:  MOV     PCHAR,@PCB      ;SET BUFFER
```

F2

```
   581  003552  005067  175230                 CLR     PTIM1           ;CLEAR TIMER
   582  003556  032777  000200  175274  PDAT7:  BIT     #200,@PTS       ;LOOK FOR READY BIT  SET
   583  003564  001011                         BNE     PDAT7B          ;IF OK: BR
   584  003566  005367  175222                 DEC     PTIM1
   585  003572  001371                         BNE     PDAT7           ;AWAIT READY
   586  003574  012704  007205          PDAT7A: MOV     #MSG33,R4
   587  003600  004767  001200                 JSR     PC,ITOUT        ;TYPE NO READY IN DATA TEST
   588  003604  000167  000746                 JMP     PEND            ;GO TO END ROUTINE
   589  003610  117700  175246          PDAT7B: MOVB    @PTB,R0         ;NO INPUT CHAR
   590  003614  120067  175202                 CMPB    R0,PCHAR        ;TEST CHAR
   591  003620  001402                         BEQ     PDAT10          ;IF OK: BR
   592  003622  004767  000556                 JSR     PC,PDE          ;GO TYPE ERROR
   593  003626  005267  175170          PDAT10: INC     PCHAR           ;SET NEW CHAR
   594  003632  032767  000400  175162         BIT     #400,PCHAR      ;SEE IF DONE ALL
   595  003640  001741                         BEQ     PDA16           ;IF NOT: BR
   596  003642  032777  010000  175200         BIT     #10000,@SWR     ;LOOK FOR INHIBIT ITERATIONS
   597  003650  001003                         BNE     PDAT11          ;IF SO: BR
   598  003652  005367  175142                 DEC     PIC             ;LOOK FOR COMPLETE ITERATIONS
   599  003656  001330                         BNE     PDAT5           ;IF NOT: BR
   600  003660  000167  000072          PDAT11: JMP     PEND            ;GO TO END ROUTINE
   601
```

```
603
604                                     ;*****************************************
605                                     ;GROUP 3: MAINTENANCE MODE
606                                     ;
607                                     ;THE MAINTENANCE MODE, ENTERED FROM
608                                     ;START VIA CONSOLE SWITCH 11, IS TO
609                                     ;PROVIDE A MEANS FOR DEBUGGING AND
610                                     ;TIME DELAY SETTING IN A REPETATIVE
611                                     ;LOOP. A FULL OPERATION IS ATTEMPTED
612                                     ;ON EACH LOOP WITH DATA CHARACTERS
613                                     ;BEING TAKEN FROM CONSOLE SWITCHES
614                                     ;0 - 7. THE DATA IS COMPIMENTED ON
615                                     ;EVERY OTHER PASS IN ORDER TO PROVIDE
616                                     ;TRANSITIONS THROUGH THE LOGIC
617                                     ;DATA MAY ALSO BE CHANGED AT THE CONSOLE
618                                     ;DYNAMICALLY.
619                                     ;ONLY ONE OF THE INTERRUPTS WILL BE
620                                     ;RECOGNIZED DEPENDING ON THE SETTING
621                                     ;OF CONSOLE SWITCH 9 AND MAY BE CHANGED
622                                     ;DYNAMICALLY.
623                                     ;*****************************************
624
625  003664  017702  175160        PSCOP:  MOV     @SWR,R2         ;R2 = DATA FROM SWITCHES
626  003670  010203                         MOV     R2,R3
627  003672  127702  175152        PSCOP0: CMPB    @SWR,R2         ;SEE IF NEW DATA
628  003676  001372                         BNE     PSCOP           ;IF SO: BR
629  003700  012777  000340  175144         MOV     #340,@PSW       ;RESET PSW TO PRIORITY 7
630  003706  005077  175146                CLR     @PTS            ;CLEAR STATUS REGISTERS
631  003712  005077  175136                CLR     @PCS
632  003716  004767  001404                JSR     PC,PRSTV        ;RESET VECTORS
633  003722  032777  001000  175120        BIT     #1000,@SWR      ;SEE IF TESTER INTERRUPT
634  003730  001012                         BNE     PSCOP1          ;IF SO: BR
635  003732  016700  175042                MOV     PVEC,R0         ;R0 = STARTING VECTOR
636  003736  012720  005224                MOV     #PINTS,(R0)+    ;SET VECTOR FOR MAINTENANCE MODE TRAP
637  003742  012720  000340                MOV     #340,(R0)+
638  003746  052777  000100  175100        BIS     #100,@PCS       ;SET CONTROLLER INTERRUPT ENABLE
639  003754  000412                         BR      PSCOP2
640  003756  052777  000100  175074 PSCOP1: BIS     #100,@PTS       ;SET TESTER INTERRUPT ENABLE
641  003764  016700  175010                MOV     PVEC,R0         ;R0 = STARTING VECTOR
642  003770  022020                         CMP     (R0)+,(R0)+     ;POINT TO TESTER VECTOR
643  003772  012720  005224                MOV     #PINTS,(R0)+    ;SET VECTOR ADDR TO MAINTENANCE MODE TRAP
644  003776  012720  000340                MOV     #340,(R0)+
645  004002  012767  004052  175022 PSCOP2: MOV     #PSCOP4,PINTR   ;SET RETURN ADDR
646  004010  012767  000010  175000         MOV     #10,PTIM2       ;SET DELAY
647  004016  005067  174772                CLR     PTIM1           ;SET DELAY
648  004022  110377  175030                MOVB    R3,@PCB         ;LOAD CHAR
649  004026  005277  175026                INC     @PTS            ;SET GO BIT
650  004032  005077  175014                CLR     @PSW            ;SET TO PRIORITY 0
651  004036  005367  174752        PSCOP3: DEC     PTIM1
652  004042  001375                         BNE     PSCOP3          ;DELAY FOR INTERRUPT
653  004044  005367  174746                DEC     PTIM2
654  004050  001372                         BNE     PSCOP3
655  004052  005103        PSCOP4: COM     R3              ;COMPLEMENT DATA
656  004054  032777  001000  174766         BIT     #1000,@SWR      ;SEE IF ON TESTER INTERRUPT
```

H1

H2

```
   657  004062  001703                          BEQ     PSCOP0          ;IF NOT; BR
   658  004064  005067  174724                  CLR     PTIM1
   659  004070  032777  000200  174762  PSCOP5: BIT     #200,@PTS       ;LOOK FOR TESTER READY
   660  004076  001375                          BNE     PSCOP0          ;IF SO; BR
   661  004100  005367  174710                  DEC     PTIM1
   662  004104  001371                          BNE     PSCOP5          ;DELAY FOR COMPLETE  FROM  TESTER
   663  004106  000167  177560                  JMP     PSCOP0          ;CONTINUE
```

```
                                        ;****************************************
                                        ;GROUP 41 LINE COUNT MODE
                                        ;
                                        ;THE LINE COUNT MODE, ENTERED VIA
                                        ;CONSOLE SWITCH 8, WILL PROVIDE A
                                        ;PRINTOUT OF THE DATA TRANSFER RATE
                                        ;IN LINES PER SECOND.  EACH PASS
                                        ;OF THE LINE COUNT MODE WILL COUNT
                                        ;THE NUMBER OF 37 CHARACTER GROUPS
                                        ;AND PRINT OUT THE AMOUNT IN
                                        ;DECIMAL FORM.  THE TEST WILL BE
                                        ;PERFORMED PER SWITCH 13; CONTINUOUSLY
                                        ;OR SINGLE PASS.
                                        ;NO OTHER SWITCHES HAVE EFFECT.
                                        ;****************************************

004112  005077  174742          PLC:    CLR     @PTS            ;CLEAR TESTER STATUS
004116  005077  174732                  CLR     @PCS            ;CLEAR CONTROLLER STATUS
004122  005077  174720                  CLR     @LKS            ;CLEAR LINE CLOCK
004126  005003                          CLR     R3              ;CLEAR CHARACTER COUNTER
004130  005277  174724                  INC     @PTS            ;SET GO
004134  016701  000152                  MOV     LINE,R1         ;SET DIVISOR
004140  052777  000100  174712          BIS     #100,@PTS       ;SET TESTER INTERRUPT ENABLE
004146  016700  174626                  MOV     PVEC,R0
004152  022020                          CMP     (R0)+,(R0)+     ;POINT TO TESTER VECTOR
004154  012720  004232                  MOV     #DINT,(R0)+     ;SET VECTOR
004160  012710  000340                  MOV     #340,(R0)       ;SET TRAP PS#
004164  016700  000124                  MOV     TIME,R0         ;SET 1 SECOND TIMER
004170  005077  174656                  CLR     @PS#            ;CLEAR PS#
004174  032777  000200  174644  PLC1:   BIT     #200,@LKS
004202  001774                          BEQ     PLC1            ;AWAIT CLOCK CYCLE START
004204  052777  000100  174634          BIS     #100,@LKS       ;SET CLOCK INTERRUPT ENABLE
004212  010077  174640          PLC2:   MOV     R0,@PCB         ;TRANSMIT CHARACTER
004216  000001                          WAIT                    ;AWAIT INTERRUPT
004220  000167  177766                  JMP     PLC2            ;CONTINUE

                                        ;CLOCK TIMER INTERRUPT HANDLER

004224  005300                  TINT:   DEC     R0              ;SEE IF DONE 1 SECOND
004226  001405                          BEQ     PLCP            ;IF SO: BR
004230  000002                          RTI                     ;ELSE RETURN

                                        ;DATA INTERRUPT HANDLER

004232  005203                  DINT:   INC     R3              ;BUMP CHARACTER COUNTER
004234  005277  174620                  INC     @PTS            ;SET GO
004240  000002                          RTI                     ;RETURN

                                        ;LINE COUNT PRINT ROUTINE

004242  005077  174600          PLCP:   CLR     @LKS            ;CLEAR CLOCK
004246  005077  174606                  CLR     @PTS            ;CLEAR TESTER
004252  005077  174576                  CLR     @PCS            ;CLEAR CONTROLLER
```

```
719  004256  071103                          DIV     R3,R1           ;DIVIDE CHARACTER AMOUNT BY LINE FACTOR
720  004260  012704  007673                  MOV     #MSG43,R4
721  004264  004767  000514                  JSR     PC,TTOUT        ;PRINT HEADER
722  004270  004767  000310                  JSR     PC,DECPNT       ;PRINT LINE AMOUNT IN DECIMAL
723  004274  032777  020000  174546          BIT     #20000,@SWR     ;SEE IF CONTINUOUS MODE
724  004302  001001                          BNE     PLCC            ;IF SO: BR
725  004304  000000                          HALT
726  004306  000167  175256          PLCC:   JMP     PLCC            ;CONTINUE
727
728  004312  000045          LINE:   45              ;DIVISOR FOR 37 CHARACTER PER LINE
729  004314  000072          TIME:   72              ;TIMER FOR 1 SECOND AT 60 CYCLES
730
731                                  ;****************************************
732                                  ;LOGIC TEST ERROR ROUTINE
733                                  ;
734                                  ;THIS ROUTINE IS USED TO DISPLAY THE
735                                  ;TEST NUMBER AND ERROR CONDITION FOUND
736                                  ;DURING GROUP 1.
737                                  ;ERROR PRINTING IS CONDITIONED BY
738                                  ;CONSOLE SWITCH 15. CONSOLE SWITCH 14
739                                  ;CONDITIONS STOP OR CONTINUE ON ERROR.
740                                  ;DUE TO TIMING AND SEQUENCE CONSIDERATIONS
741                                  ;ANY LOGIC ERROR WILL RESULT IN A RESTART
742                                  ;OF THE LOGIC TEST.
743                                  ;****************************************
744
745  004316  032777  100000  174524  PLE:     BIT     #100000,@SWR    ;SEE IF NO PRINT
746  004324  001012                          BNE     PCONTL          ;IF SO: BR
747  004326  012704  005512                  MOV     #MSG0,R4        ;R4 = TEST NUMBER MSG ADDR
748  004332  016764  174446  000020          MOV     PTN,+20(R4)     ;SET TEST  NUMBER
749  004340  004767  000440                  JSR     PC,TTOUT        ;GO TYPE TEST NUMBER
750  004344  010304                          MOV     R3,R4           ;R4 = ERROR MAG ADDR
751  004346  004767  000432                  JSR     PC,TTOUT        ;PRINT ERROR
752  004352  032777  040000  174470  PCONTL: BIT     #40000,@SWR     ;SEE IF HALT ON ERROR
753  004360  001401                          BEQ     PGOL            ;IF NOT: BR
754  004362  000000                          HALT
755  004364  032777  002000  174456  PGOL:   BIT     #2000,@SWR      ;SEE IF IN ERROR BIT TEST
756  004372  001774                          BEQ     PGOL            ;IF NOT: BR
757  004374  000167  176744                  JMP     PBIT2           ;RETRY ERROR BIT TEST
758  004400  000167  174574          PGO:    JMP     PSKIP           ;RESTART
759
```

K2

```
                                        ;*****************************************
                                        ;DATA TEST ERROR ROUTINE
                                        ;
                                        ;THIS ROUTINE IS USED TO DISPLAY ANY
                                        ;GROUP TWO ERROR.
                                        ;ANY BAD DATA CHARACTER WILL BE PRINTED
                                        ;ALONG WITH THE EXPECTD DATA AS RIGHT
                                        ;BITS OF ONES AND ZEROS.
                                        ;ERROR PRINTING IS CONDITIONED BY CONSOLE
                                        ;SWITCH 13. CONSOLE SWITCH 14 CONDITIONS
                                        ;STOP OR CONTINUE ON ERROR. A DATA ERROR
                                        ;WILL RESULT IN CONTINUATION AT THE NEXT
                                        ;PATTERN OR ITERATION.
                                        ;*****************************************

004404  032777  100000  174436  PDE1:   BIT     #100000,@SWR    ;SEE IF NO PRINT
004412  001053                          BNE     PCONTD          ;IF NO PRINT: BR
004414  012704  007123                  MOV     #MSG27,R4       ;GET ERROR MSG ADDR
004420  004767  000360                  JSR     PC,TTOUT
004424  012704  007140                  MOV     #MSG30,R4
004430  004767  000350                  JSR     PC,TTOUT        ;TYPE EXPECTED DATA HEADER
004434  005003                          CLR     R3
004436  016704  174360                  MOV     PCHAR,R4        ;R4 = EXPT CHAR
004442  012705  000010          PDE1:   MOV     #10,R5          ;R5 = NUMBER OF BITS TO TYPE
004446  105777  174370          PDE2:   TSTB    @TPS
004452  100375                          BPL     PDE2            ;AWAIT TTY READY
004454  132704  000200                  BITB    #200,R4         ;SEE IF ONE OR ZERO
004460  001404                          BEQ     PDE3            ;IF ZERO: BR
004462  012777  000061  174354          MOV     #061,@TPB       ;TYPE A ONE
004470  000403                          BR      PDE4
004472  012777  000060  174344  PDE3:   MOV     #060,@TPB       ;TYPE A ZERO
004500  006104                  PDE4:   ROL     R4              ;GET NEXT BIT
004502  005305                          DEC     R5              ;SEE IF DONE ALL
004504  001360                          BNE     PDE2            ;IF NOT: BR
004506  005703                          TST     R3              ;LOOK FOR RECIEVED DONE FLAG
004510  001010                          BNE     PDE5            ;IF NOT: BR
004512  012704  007161                  MOV     #MSG31,R4
004516  004767  000262                  JSR     PC,TTOUT        ;TYPE RECIEVED DATA HEADER
004522  005203                          INC     R3              ;SET FLAG
004524  010004                          MOV     R0,R4           ;SET RECIEVED CHAR IN R4
004526  000167  177710                  JMP     PDE1            ;DO RECIEVED
004532  012704  007202          PDE5:   MOV     #MSG32,R4
004536  004767  000242                  JSR     PC,TTOUT        ;TYPE CR/LF
004542  032777  040000  174300  PCONTD: BIT     #40000,@SWR     ;SEE IF HALT ON ERROR
004550  001401                          BEQ     PGOD            ;IF NO: BR
004552  000000                          HALT
004554  000207                  PGOD:   RTS     PC              ;RETURN
```

```
                                        ;*****************************************
                                        ;PROGRAM END ROUTINE
                                        ;
                                        ;THIS ROUTINE IS USED TO PRINT OUT
                                        ;"END OF TEST" AND THEN HALT AT
                                        ;THE END OF A SINGLE PASS OR TO
                                        ;RESTART WITH NO PRINT OUT DEPENDING
                                        ;ON CONSOLE SWITCH 13.
                                        ;*****************************************

004556  032777  020000  174264  PEND:   BIT     #20000,@SWR     ;LOOK FOR CONTUOUS MODE
004564  001005                          BNE     PLOOP           ;IF SO: BR
004566  012704  006067                  MOV     #MSG7,R4
004572  004767  000200                  JSR     PC,TTOUT        ;PRINT END OF TEST
004576  000000                          HALT
004600  000167  174374          PLOOP:  JMP     @SKIP           ;LOOP
```

```
                                        ;*************************************
                                        ;DECIMAL PRINT ROUTINE
                                        ;
                                        ;PRINT THE CONTENTS OF R3 IN DECIMAL
                                        ;*************************************

004604  012767  177773  000152  DECPRT: MOV     #-5,DIGCNT
004612  012767  004772  000150          MOV     #DECPNT+2,DECPNT
004620  005067  000142                  CLR     ZERO
004624  012767  177777  000130  TYPI1:  MOV     #-1,DIGIT
004632  005267  000124          TYPI2:  INC     DIGIT
004636  167703  000120                  SUB     @DECPNT,R3
004642  100373                          BPL     TYPI2
004644  067703  000120                  ADD     @DECPNT,R3
004650  004767  000020                  JSR     PC,DECOUT
004654  005267  000104                  INC     DIGCNT
004660  001001                          BNE     TYPI3
004662  000207                          RTS     PC
004664  062767  000002  000076  TYPI3:  ADD     #2,DECPNT
004672  000754                          BR      TYPI1
004674  005767  000062          DECOUT: TST     DIGIT
004700  001010                          BNE     DEC1
004702  022767  177777  000054          CMP     #-1,DIGCNT
004710  001404                          BEQ     DEC1
004712  016767  000050  000042          MOV     ZERO,DIGIT
004720  000406                          BR      DEC2
004722  012767  000260  000036  DEC1:   MOV     #260,ZERO
004730  052767  000260  000024          BIS     #260,DIGIT
004736  005767  000020          DEC2:   TST     DIGIT
004742  001406                          BEQ     DEC3
004744  105777  174072                  TSTB    @TPS
004750  100372                          BPL     DEC2
004752  016777  000004  174064          MOV     DIGIT,@TPB
004760  000207          DEC3:   RTS     PC

004762  000000          DIGIT:  0
004764  000000          DIGCNT: 0
004766  000000          ZERO:   0
004770  004774          DECPNT: .+2
004772  023420                  10000.
004774  001750                  1000.
004776  000144                  100.
005000  000012                  10.
005002  000001                  1.
```

A3

```
                                        ;*************************************
                                        ;TTY OUTPUT ROUTINE
                                        ;
                                        ;ROUTINE TO OUTPUT ANY MESSAGE
                                        ;*************************************

005004  112467  174014         TTOUT:  MOVB    (R4)+,TOB       ;TOB = OUTPUT CHAR
005010  122767  000043  174006          CMPB    #43,TOB         ;LOOK FOR TERMINATOR
005016  001430                          BEQ     TEX             ;EXIT
005020  122767  000045  173776          CMPB    #45,TOB         ;LOOK FOR CR/LF
005026  001403                          BEQ     TCRLF           ;IF SO: BR
005030  004767  000030                  JSR     PC,TOG          ;GO TYPE CHAR
005034  000763                          BR      TTOUT           ;CONTINUE
005036  112767  000015  173760 TCRLF:  MOVB    #15,TOB         ;TOB = CR
005044  004767  000014                  JSR     PC,TOG          ;GO TYPE CR
005050  112767  000012  173746          MOVB    #12,TOB         ;TOB = LF
005056  004767  000002                  JSR     PC,TOG          ;GO TYPE LF
005062  000750                          BR      TTOUT           ;CONTINUE
005064  105777  173752          TOG:    TSTB    @TPS            ;LOOK FOR DONE
005070  100375                          BPL     TOG             ;AWAIT FLAG
005072  116777  173726  173744          MOVB    TOB,@TPB        ;ECHO CHAR
005100  000207                  TEX:    RTS     PC              ;EXIT


                                        ;*************************************
                                        ;TTY INPUT ROUTINE
                                        ;
                                        ;THIS ROUTINE IS USED TO READ IN THE
                                        ;VECTOR AND REGISTER SETTINGS.
                                        ;*************************************

005102  005014                  READ:   CLR     @R4             ;CLEAR FOR INPUT
005104  004767  000042          READ1:  JSR     PC,TTIN         ;GO READ KEYBOARD AND ECHO
005110  022767  000215  173710          CMP     #215,TIB        ;LOOK FOR CR
005116  001414                          BEQ     REX             ;IF SO: BR
005120  016701  173704                  MOV     ROTA,R1         ;SET ROTATION FACTOR
005124  000241                  ROT:    CLC
005126  006114                          ROL     @R4             ;ROTATE INPUT
005130  005301                          DEC     R1              ;DECREMENT POSITION FACTOR
005132  001374                          BNE     ROT             ;DO ALL ROTATIONS
005134  040567  173666                  BIC     R5,TIB          ;STRIP ASCII
005140  056714  173662                  BIS     TIB,@R4         ;SET NEW DIGIT
005144  005303                          DEC     R3              ;DECREMENT CHAR CNTR
005146  001356                          BNE     READ1           ;CONTINUE
005150  000207                  REX:    RTS     PC              ;EXIT

                                        ;GET CHAR FROM KEYBOARD AND ECHO

005152  005077  173660          TTIN:   CLR     @TKS
005156  005077  173656                  CLR     @TKB
005162  005067  173640                  CLR     TIB
005166  005277  173644                  INC     @TKS            ;SET READER GO BIT
005172  105777  173640          TTIN1:  TSTB    @TKS            ;AWAIT DONE
```

```
   931  005170  100375                          BPL     TTIN1
   932  005200  017767  173034  173020          MOV     @TKB,TIB        ;TIB = INPUT CHAR
   933  005206  105777  173030          TTIN2:  TSTB    @TPS            ;AWAIT PUNCH READY
   934  005212  100375                          BPL     TTIN2
   935  005214  116777  173000  173022          MOVB    TIB,@TPB        ;DO ECHO
   936  005222  000207                          RTS     PC              ;EXIT
   937
```

```
                                        ;**********************************
                                        ;MAINTENANCE MODE INTERRUPT ROUTINE
                                        ;
                                        ;THIS ROUTINE IS USED TO RESET THE
                                        ;STACK POINTER AND TO RESET VECTORS
                                        ;IO HALTS THEN RETURN.
                                        ;**********************************

005224  032626              PINTS:  BIT     (SP)+,(SP)+     ;RESET STACK POINTER
005226  004767  000074              JSR     PC,PRSTV        ;RESET VECTORS
005232  000177  173574              JMP     @PINTR          ;RETURN

                                        ;**********************************
                                        ;LOGIC TEST INTERRUPT ROUTINE
                                        ;
                                        ;THIS ROUTINE IS USED TO RESET THE
                                        ;THE STACK POINTER AND TO ASSURE THAT
                                        ;THE INTERRUPT DOES INDEED CLEAR.
                                        ;IF THE INTERRUPT SHOULD NOT CLEAR
                                        ;IT WILL BE FLAGGED AS AN ERROR.
                                        ;IF THE INTERRUPT IS CLEARED, THEN
                                        ;THE VECTORS WILL BE RESET AND A
                                        ;RETURN EXCUTED.
                                        ;**********************************

005236  022626              PINT:   CMP     (SP)+,(SP)+     ;RESET STACK POINTER
005240  005077  173614              CLR     @PTS            ;RESET INTERRUPT ENABLE IN TESTER
005244  005077  173604              CLR     @PCS            ;RESET CONT INTERRUPT ENABLE
005250  024040                      CMP     -(R0),-(R0)     ;POINT TO PROPER VECTOR
005252  012720  005316              MOV     #PINTE,(R0)+    ;SET TO ERROR VECTOR
005256  012720  000340              MOV     #340,(R0)+
005262  005077  173564              CLR     @PSW            ;SET PSW TO LOWEST PRIORITY
005266  005067  173522              CLR     PTIM1           ;SET TIME
005272  005367  173516      PINT1:  DEC     PTIM1
005276  001375                      BNE     PINT1           ;AWAIT ANY ERROR INTERRUPTS
005300  012777  000340  173544      MOV     #340,@PSW       ;RESET PSW
005306  004767  000014              JSR     PC,PRSTV        ;RESET VECTORS
005312  000177  173514              JMP     @PINTR          ;RETURN
005316  012704  006105      PINTE:  MOV     #MSG10,R4
005322  000167  176770              JMP     PLE             ;GO TO ERROR ROUTINE
```

```
                                        ;*************************************
                                        ;RESET VECTOR ROUTINE
                                        ;
                                        ;THIS ROUTINE IS USED TO RESET BOTH
                                        ;CONTROLLER AND TESTER VECTORS TO
                                        ;HALT TRAPS.
                                        ;*************************************

005320  016700  173440          PRSTV:  MOV     PVEC,R0         ;R0 = CONT VECTOR
005332  010001                          MOV     R0,R1
005334  005721                          TST     (R1)+           ;POINT TO CONT HALT LOC
005336  010120                          MOV     R1,(R0)+        ;SET CONT VECTOR ADDR
005340  005020                          CLR     (R0)+           ;SET CONT HALT
005342  022121                          CMP     (R1)+,(R1)+     ;POINT TO TESTER HALT
005344  010120                          MOV     R1,(R0)+        ;SET TESTER VECTOR ADDR
005346  005020                          CLR     (R0)+           ;SET TESTER HALT
005350  000207                          RTS     PC              ;RETURN

                                        ;*************************************
                                        ;POWER FAIL ROUTINE
                                        ;
                                        ;THIS ROUTINE IS USED TO SAVE ALL
                                        ;PROCESSOR REGISTERS AND POINT TO
                                        ;THE POWER UP ROUTINE BEFORE
                                        ;HALTING.
                                        ;*************************************

005352  010046                  PWRFAL: MOV     R0,-(SP)
005354  010146                          MOV     R1,-(SP)
005356  010246                          MOV     R2,-(SP)
005360  010346                          MOV     R3,-(SP)
005362  010446                          MOV     R4,-(SP)
005364  010546                          MOV     R5,-(SP)
005366  016746  172432                  MOV     24,-(SP)
005372  010667  173410                  MOV     SP,PSPS         ;SAVE STACK POINTER
005376  012767  005406  172420          MOV     #PWRUP,24
005404  000000                          HALT

                                        ;*************************************
                                        ;POWER UP ROUTINE
                                        ;
                                        ;THIS ROUTINE IS USED TO RESTORE
                                        ;ALL PROCESSOR REGISTERS AND TYPE
                                        ;OUT A POWER FAIL MESSAGE BEFORE
                                        ;RESTARTING.
                                        ;*************************************

005406  012777  000340  173436  PWRUP:  MOV     #340,@PSW
005414  016706  173366                  MOV     PSPS,SP
005420  012667  172400                  MOV     (SP)+,24
005424  012605                          MOV     (SP)+,R5
005426  012604                          MOV     (SP)+,R4
005430  012603                          MOV     (SP)+,R3
```

```
 1036  005432  012602                      MOV     (SP)+,R2
 1037  005434  012601                      MOV     (SP)+,R1
 1038  005436  012600                      MOV     (SP)+,R0
 1039  005440  005005                      CLR     R5
 1040  005442  005305                      DEC     R5
 1041  005444  001376                      BNE     .-2
 1042  005446  012704  007536              MOV     #MSG40,R4       ;TYPE POWER FAIL MESSAGE
 1043  005452  004767  177326              JSR     PC,TTOUT
 1044  005456  005305                      DEC     R5
 1045  005460  001376                      BNE     .-2
 1046  005462  000167  173520              JMP     PREG
 1047
```

```
1049
1050                                        ;***********************
1051                                        ;DATA PATTERNS
1052                                        ;***********************
1053
1054                                        .EVEN
1055  005466  000  377  376  PPAT8:  .BYTE  0,377,376,375,373,367,357,337,277,177
      005471  375  373  367
      005474  357  337  277
      005477  177
1056  005500  001  002  004          .BYTE  1,2,4,10,20,40,100,200
      005503  010  020  040
      005506  100  200
1057  005510  377                PPAT9:  .BYTE  377
1058          005512                      .EVEN
1059
1060
1061                                        ;***********************
1062                                        ;MESSAGE TABLE
1063                                        ;***********************
1064
1065  005512  046045  043517  041511  MSG0:  .ASCII  /?LOGIC TEST NO. 00?/
      005520  052040  051505  020124
      005526  047516  020056  030060
      005534  043
1066
1067  005535  045  050114  030503  MSG1:  .ASCII  /?LPC11 INTERFACE TEST??/
      005542  020061  047111  042524
      005550  043122  041501  020105
      005556  042524  052123  021445
1068
1069  005564  042445  052116  051105  MSG2:  .ASCII  /?ENTER STARTING VECTOR ADDRESS??/
      005572  051440  040524  052122
      005600  047111  020107  042526
      005606  052103  051117  040440
      005614  042104  042522  051523
      005622  021445
1070
1071  005624  044445  046114  043505  MSG3:  .ASCII  /?ILLEGAL VECTOR! TRY AGAIN??/
      005632  046101  053040  041505
      005640  047524  035122  052040
      005646  054522  040440  040507
      005654  047111  021445
1072
1073  005660  042445  052116  051105  MSG4:  .ASCII  /?ENTER STARTING REGISTER ADDRESS??/
      005666  051440  040524  052122
      005674  047111  020107  042522
      005702  044507  052123  051105
      005710  040440  042104  042522
      005716  051523  021445
1074
1075  005722  044445  046114  043505  MSG5:  .ASCII  /?ILLEGAL REGISTER! TRY AGAIN??/
      005730  046101  051040  043505
      005736  051511  042524  035122
```

```
                005744  052040  054522  040440
                005752  040507  047111  021445
  1076
  1077  005760  051445  052105  044440  MSG6:   .ASCII  /%SET INTERFACE TO 'ON LINE' AND 'TEST MODE'%/
        005766  052116  051105  040506
        005774  042503  052040  020117
        006002  047447  020116  044514
        006010  042516  020047  047101
        006016  020104  052047  051505
        006024  020124  047515  042504
        006032  022447
  1078  006034  054524  042520  023440          .ASCII  /TYPE 'G' WHEN READY TO GO%%/
        006042  023507  053440  042510
        006050  020116  042522  042101
        006056  020131  047524  043440
        006064  022517     043
  1079
  1080  006067     045  047105  020104  MSG7:   .ASCII  /%END OF TEST%%/
        006074  043117  052040  051505
        006102  022524     043
  1081
  1082  006105     045  047111  042524  MSG10:  .ASCII  /%INTERRUPT HANG UP%%/
        006112  051122  050125  020124
        006120  040510  043516  052440
        006126  021520     045
  1083
  1084  006131     045  042523  020124  MSG11:  .ASCII  /%SET INTERFACE TO 'OFF LINE' AND 'TEST MODE'%/
        006136  047111  042524  043122
        006144  041501  020105  047524
        006152  023440  043117  020106
        006160  044514  042516  020047
        006166  047101  020104  052047
        006174  051505  020124  047515
        006202  042504  022447
  1085  006206  054524  042520  023440          .ASCII  /TYPE 'G' WHEN READY TO GO%%/
        006214  023507  053440  042510
        006222  020116  042522  042101
        006230  020131  047524  043440
        006236  022517     043
  1086
  1087  006241     045  040503  047116  MSG12:  .ASCII  /%CANNOT CLEAR TESTER STATUS%%/
        006246  052117  041440  042516
        006254  051101  052040  051505
        006262  042524  020122  052123
        006270  052101  051525  021445
  1088
  1089  006276  041445  047101  047516  MSG13:  .ASCII  /%CANNOT CLEAR CONTROLLER STATUS%%/
        006304  020124  046103  040505
        006312  020122  047503  052116
        006320  047522  046114  051105
        006326  051440  040524  052524
        006334  022523     043
  1090
  1091  006337     045  047503  052116  MSG14:  .ASCII  /%CONTROLLER READY NOT RESET BY CHAR LOAD%%/
```

```
        006344  047522  046114  051105
        006352  051040  040505  054504
        006360  047040  052117  051040
        006366  051505  052105  041040
        006374  020131  044103  051101
        006402  046040  040517  022504
        006410     043

 1092
 1093   006411     045  042524  052123  MSG15:  .ASCII  /%TESTER READY NOT SET AFTER CHAR LOAD%%/
        006416  051105  051040  040505
        006424  054504  047040  052117
        006432  051440  052105  040440
        006440  052106  051105  041440
        006446  040510  020122  047514
        006454  042101  021445
 1094
 1095   006460  043445  020117  044502  MSG16:  .ASCII  /%GO BIT WILL NOT RESET%%/
        006466  020124  044527  046114
        006474  047040  052117  051040
        006502  051505  052105  021445
 1096
 1097   006510  052045  051505  042524  MSG17:  .ASCII  /%TESTER READY RESETS FROM GO%%/
        006516  020122  042522  042101
        006524  020131  042522  042523
        006532  051524  043040  047522
        006540  020115  047507  021445
 1098
 1099   006546  041445  047117  051124  MSG20:  .ASCII  /%CONTROLLER READY NOT SET FROM GO%%/
        006554  046117  042514  020122
        006562  042522  042101  020131
        006570  047516  020124  042523
        006576  020124  051106  046517
        006604  043440  022517     043
 1100
 1101   006611     045  042524  052123  MSG21:  .ASCII  /%TESTER READY NOT SET AT END OF CYCLE%%/
        006616  051105  051040  040505
        006624  054504  047040  052117
        006632  051440  052105  040440
        006640  020124  047105  020104
        006646  043117  041440  041531
        006654  042514  021445
 1102
 1103   006660  041445  047117  051124  MSG22:  .ASCII  /%CONTROLLER READY SET AT END OF CYCLE%%/
        006666  046117  042514  020122
        006674  042522  042101  020131
        006702  042523  020124  052101
        006710  042440  042116  047440
        006716  020106  054503  046103
        006724  022505     043
 1104
 1105   006727     045  047516  044440  MSG24:  .ASCII  /%NO INTERRUPT FROM TESTER READY%%/
        006734  052116  051105  052522
        006742  052120  043040  047522
        006750  020115  042524  052123
```

```
                006750  051105  051040  040505
                006764  054504  021445
  1106
  1107  006770  047045  020117  047111  MSG25:  .ASCII  /?NO INTERRUPT FROM CONTROLLER READY??/
        006776  042524  051122  050125
        007004  020124  051106  046517
        007012  041440  047117  051124
        007020  046117  042514  020122
        007026  042522  042101  022531
        007034     043
  1108
  1109  007035     045  051105  047522  MSG26:  .ASCII  /?ERROR BIT WILL NOT GO TO PROPER STATE?/
        007042  020122  044502  020124
        007050  044527  046114  047040
        007056  052117  043440  020117
        007064  047524  050040  047522
        007072  042520  020122  052123
        007100  052101  022505
  1110  007104  047506  020122  044124          .ASCII  /FOR THIS MODE??/
        007112  051511  046440  042117
        007120  022505     043
  1111
  1112  007123     045  040504  040524  MSG27:  .ASCII  /?DATA ERROR??/
        007130  042440  051122  051117
        007136  021445
  1113
  1114  007140  042445  050130  041505  MSG30:  .ASCII  /?EXPECTED DATA: ?/
        007146  042524  020104  040504
        007154  040524  020072     043
  1115
  1116  007161     045  042522  044503  MSG31:  .ASCII  /?RECIEVED DATA: ?/
        007166  053105  042105  042040
        007174  052101  035101  021440
  1117
  1118  007202  022445     043          MSG32:  .ASCII  /???/
  1119
  1120
  1121  007205     045  047516  051040  MSG33:  .ASCII  /?NO READY FLAG DURING DATA TEST??/
        007212  040505  054504  043040
        007220  040514  020107  052504
        007226  044522  043516  042040
        007234  052101  020101  042524
        007242  052123  021445
  1122
  1123  007246  052045  051505  042524  MSG34:  .ASCII  /?TESTER INTERRUPTS WITH NO INTERRUPT ENABLE??/
        007254  020122  047111  042524
        007262  051122  050125  051524
        007270  053440  052111  020110
        007276  047516  044440  052116
        007304  051105  052522  052120
        007312  042440  040516  046102
        007320  022505     043
  1124
  1125  007323     045  042524  052123  MSG35:  .ASCII  /?TESTER INTERRUPTS AT HIGHER THAN LEVEL 4??/
```

```
        007330  051105  044440  052116
        007336  051105  052522  052120
        007344  020123  052101  044040
        007352  043911  042510  020122
        007360  044124  047101  046040
        007366  053105  046105  032040
        007374  021445
  1126
  1127  007376  041445  047117  051124  MSG36:  .ASCII  /%CONTROLLER INTERRUPTS WITH NO INTERRUPT ENABLE%%/
        007404  046117  042514  020122
        007412  047111  042524  051122
        007420  050125  051524  053440
        007426  052111  020110  047516
        007434  044440  052116  051105
        007442  052522  052120  042440
        007450  040516  046102  022505
        007456     043
  1128
  1129  007457     045  047503  052116  MSG37:  .ASCII  /%CONTROLLER INTERRUPTS AT HIGHER THAN LEVEL 4%%/
        007464  047522  046114  051105
        007472  044440  052116  051105
        007500  052522  052120  020123
        007506  052101  044040  043911
        007514  042510  020122  044124
        007522  047101  046040  053105
        007530  046105  032040  021445
  1130
  1131  007536  051045  051505  040524  MSG40:  .ASCII  /%RESTART FROM POWER FAILURE%%/
        007544  052122  043040  047522
        007552  020115  047520  042527
        007560  020122  040506  046111
        007566  051125  022505     043
  1132
  1133  007573     045  047503  052116  MSG41:  .ASCII  /%CONT READY NOT RESET BY INIT%%/
        007600  051040  040505  054504
        007606  047040  052117  051040
        007614  051505  052105  041040
        007622  020131  047111  052111
        007630  021445
  1134
  1135  007632  052045  051505  042524  MSG42:  .ASCII  /%TESTER READY NOT RESET BY INIT%%/
        007640  020122  042522  042101
        007646  020131  047516  020124
        007654  042522  042523  020124
        007662  054502  044440  044516
        007670  022524     043
  1136
  1137  007673     045  044514  042516  MSG43:  .ASCII  /%LINES PER SECOND: %%/
        007700  020123  042520  020122
        007706  042523  047503  042116
        007714  020072  021445
  1138
  1139  007720  042445  051122  051117  MSG44:  .ASCII  /%ERROR STATUS BIT TEST %/
        007726  051440  040524  052524
```

K2

K3

```
                007734  020123  046502  020124
                007742  042524  052123  022440
  1140          007750  042523  020124  047111          .ASCII  /SET INTERFACE TO 'ON LINE' AND 'NORMAL MODE'@/
                007756  042524  043122  041501
                007764  020105  047524  023440
                007772  047117  046040  047111
                010000  023505  040440  042116
                010006  023440  047516  046522
                010014  046101  046440  042117
                010022  023505     045
  1141          010025     124  050131  020105          .ASCII  /TYPE 'G' WHEN READY TO GO @@/
                010032  043447  020047  044127
                010040  047105  051040  040505
                010046  054504  052040  020117
                010054  047507  022440     043
  1142
  1143          010061     045  042523  020124  MSG45:  .ASCII  /@SET INTERFACE TO 'OFF LINE' AND 'NORMAL MODE'@/
                010066  047111  042524  043122
                010074  041501  020105  047524
                010102  023440  043117  020106
                010110  044514  042516  020047
                010116  047101  020104  047047
                010124  051117  040515  020114
                010132  047515  042504  022447
  1144          010140  054524  042520  023440          .ASCII  /TYPE 'G' WHEN READY TO GO @@/
                010146  023507  053440  042510
                010154  020116  042522  042101
                010162  020131  047524  043440
                010170  020117  021445
  1145
  1146          010174  042445  051122  051117  MSG46:  .ASCII  /@ERROR BIT OK@@/
                010202  041040  052111  047440
                010210  022513     043
  1147                  000001                          .END
```

2

L3

```
DECOUT   004674          845     851#
DECPNT   004770          838#    842     844     849#    869#
DECPRT   004604          722     837#
DEC1     004722          852     854     857#
DEC2     004736          856     859#    862
DEC3     004760          860     864#
DIGCNT   004764          837#    846#    853     867#
DIGIT    004762          840#    841#    851     855#    858#    859     863     866#
DINT     004232          691     710#
LINE     004312          687     720#
LRS      001046          124#    844#    695     697#    716#
MSG0     005512          747    1065#
MSG1     005535          168    1067#
MSG10    006105          978    1082#
MSG11    006131          805    1084#
MSG12    006241          269    1087#
MSG13    006276          261    1089#
MSG14    006337          294    1091#
MSG15    006411          305    1093#
MSG16    006460          317    1095#
MSG17    006510          325    1097#
MSG2     005564          170    1069#
MSG20    006546          336    1099#
MSG21    006611          348    1101#
MSG22    006660          358    1103#
MSG24    006727          380    1105#
MSG25    006770          405    1107#
MSG26    007035          522    1109#
MSG27    007123          779    1112#
MSG3     005624          185    1071#
MSG30    007140          781    1114#
MSG31    007161          798    1116#
MSG32    007202          803    1118#
MSG33    007205          586    1121#
MSG34    007246          431    1123#
MSG35    007323          450    1125#
MSG36    007376          473    1127#
MSG37    007457          489    1129#
MSG4     005660          191    1073#
MSG40    007536         1042    1131#
MSG41    007573          277    1133#
MSG42    007632          285    1135#
MSG43    007673          720    1137#
MSG44    007720          500    1139#
MSG45    010061          503    1143#
MSG46    010174          509    1146#
MSG5     005722          204    1075#
MSG6     005760          216     507    1077#
MSG7     006067          824    1060#
PBEG     001206           89     150#   1046
PC       =%000007         51#    169#    174#    179#    186#    192#    197#    205#    217#    222#    258#    392#    498#
                         501#    504#    506#    508#    510#    512#    517#    524#    569#    587#    592#    632#    721#
                         722#    749#    751#    780#    782#    799#    804#    808#    825#    845#    848#    864#    889#
                         892#    894#    899#    910#    922#    936#    949#    976#    999#   1043#
```

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M3

```
PCR       001056            128#    291#    342#    375#    424#    445#    559#    580#    648#    699#
PCHAR     001042            111#    555#    556#    559     567     579#    580     590     593#    594     784
PCLP      001244            100#    102
PCONTL    004542            770     805#
PCOATL    004352            746     752#
PCS       001054            127#    208     254#    259     275     292     334     350     385#    390#    411#    439#    460#
                            481#    485#    518     552#    631#    638#    663#    718#    967#
PDA1      003374            498     511     550#
PDA10     003400            551#    571     574
PDAT1     003440            559#    573
PDAT10    003620            591     593#
PDAT11    003660            597     600#
PDAT12    003452            561#    564
PDAT12A   003474            562     566#
PDAT13    003512            568     570#
PDAT14    003532            557     578#
PDAT15    003540            579#    599
PDAT16    003544            580#    595
PDAT17    003556            582#    585
PDAT17A   003574            585     586#
PDAT17B   003610            583     589#
PDE       004404            569     592     777#
PDE1      004442            765#    802
PDE2      004446            786#    787     795
PDE3      004472            789     792#
PDE4      004500            791     793#
PDE5      004532            797     803#
PEB1      003176            483     494#
PEBT0     003224            497     499#
PEBT11    003312            501     504     506     508     512#
PEBT12    003344            518#    757
PEBT13    003372            521     524#
PEND      004556            588     600     822#
PET       001034            116#    158     499#    502#    520
PGO       004400            758#
PGOD      004554            806     808#
PGOP      001012            107#    218     513
PGOL      004364            753     755#    756
PIC       001020            110#    551#    572#    578#    598#
PINT      005236            368     394     965#
PINTB     005316            969     978#
PINTF     001032            115#    373#    398#    421#    448#    468#    645#    950     977
PINTS     005224            419     466     636     643     948#
PINT1     005272            973#    974
PITA      001010            106#    414#    430     465#
PLC       004112            234     682#
PLCC      001570            227     232#    726
PLCG      004306            724     726#
PLCP      004242            705     716#
PLC1      004174            695#    696
PLC2      004212            698#    700
PLP       004316            262     270     278     286     295     306     318     326     337     349     359     381     400
                            432     451     474     490     523     745#    979
PLOOP     004600            823     827#
```

```
PPATB   005510   556   1057#
PPA1B   005466   550   1055#
PREG    001002   1038#  193   198   200   202   207
PREGF   001444   199   201   204#
PRG     001356   183   191#
PRG1    001366   193#  206
PRSIV   005326   258   392   495   632   949   976   991#
PSCOP   003664   226   625#  628
PSCOP0  003672   627#  657   660   663
PSCOP1  003756   634   640#
PSCOP2  004002   639   645#
PSCOP3  004036   651#  652   654
PSCOP4  004052   648   655#
PSCOP5  004070   659#  662
PSFT    001456   203   207#
PSKIP   001200    92   148#  788   827
PSMC    001554   164   226#
PSPS    001006   105#  1017#  1031
PSTAK1  001210   149   181#
PSW     001052   126#  192#  374#  399#  422#  429#  447#  469#  629#  650#  694#  971#  975#
                 1030#
PTB     001062   130#  437#  458#  479#  554#  566   589
PTIM1   001014   108#  300#  301#  312#  313#  331#  332#  343#  344#  354#  371#  378#  387#
                 388#  390#  401#  423#  425#  427#  443#  470#  560#  563#  581#  584#  647#
                 651#  658#  661#  972#  973#
PTIM2   001016   109#  372#  378#  397#  403#  646#  653#
PTN     001004   104#  257#  266#  274#  282#  290#  299#  310#  322#  330#  341#  353#  363#
                 385#  410#  436#  457#  478#  494#  748
PTS     001060   129#  256#  267   283   303   311#  315   323   346   364#  370#  386#  400#
                 412#  438#  446#  459#  471#  480#  553#  561   582   630#  640#  649#  659
                 682#  686#  688#  711#  717#  966#
PT1     001604   233   255#
PT1A    002064   313#  314
PT1A1   001646   260   266#
PT1A1A  001674   268   274#
PT1A1B  001722   276   282#
PT1A2   001750   284   290#
PT1A3   002004   293   299#
PT1A3A  002016   301#  302
PT1A4   002044   304   310#
PT1B    002220   344#  345
PT1B1   002112   316   322#
PT1B2   002140   324   330#
PT1B2A  002152   332#  333
PT1B3   002200   335   341#
PT1C    002246   347   353#  355
PT1E    002302   357   363#
PT1F    002376   376#  377   379
PT1FA   002422   373   385#
PT1FF   002440   388#  389
PT1FC   002446   390#  391
PT1G    002526   401#  402   404
PT1H    002552   398   410#
PT1HA   002614   419#
```

```
PT1MR     002624            4218
PT1J      002646            425#    426     449     472
PT1K      002654            427#    428
PT1L      002674            415     431#
PT1M      002704            414     436#
PT1M1     002734            443#    444
PT1N      002774            440     450#
PT1P      003004            441     457#
PT1Q      003060            468#    488
PT1R      003104            464     473#
PT1S      003114            465     478#
PT1T      003166            487     489#
PVE       001344            181     185#
PVEC      001000            102#    175     180     182     366     393     417     462     635     641     689     991
PVI       001276            175#    187
PWRFAL    005352             64     1010#
PWRUP     005406           1015     1030#
READ      005102            179     197     222     517     909#
READ1     005104            910#    921
REX       005150            912     922#
ROT       005124            914#    917
ROTA      001030            114#    177#    195#    220#    515#    913
R0      =%000000             44#    154#    155#    158#    159#    160#    207#    212#    366#    367     368#    369#    393#
                            394#    395#    417#    418     419#    420#    462#    466#    467#    518#    519#    520     566#
                            567     589#    590     635#    636#    637#    641#    642     643#    644#    649#    690     691#
                            692#    693#    698     704#    801     968     969#    970#    991#    992     994#    995#    997#
                            998#   1010    1038#
R1      =%000001             45#    157#    161#    208#    212#    550#    556     558     687#    719#    913#    916#    992#
                            993     994     996     997    1011    1037#
R2      =%000002             46#    148#    150#    163     625#    626     627    1012    1036#
R3      =%000003             47#    176#    194#    219#    261#    269#    277#    285#    294#    305#    317#    325#    336#
                            348#    358#    380#    405#    416#    422     431#    450#    463#    469     473#    486#    489#
                            514#    522#    626#    648     655#    685#    710#    719     750     783#    796     800#    842#
                            844#    920#   1013    1035#
R4      =%000004             48#    168#    170#    175#    185#    191#    193#    204#    216#    218#    415#    421     464#
                            468     487#    500#    503#    505#    507#    509#    513#    586#    720#    747#    748#    750#
                            779#    781#    784#    788     793#    798#    801#    803#    824#    884     909#    915#    919#
                            978#   1014    1034#   1042#
R5      =%000005             49#    178#    196#    241#    413#    440     442#    461#    482     484#    516#    785#    794#
                            918     1015    1033#   1039#   1040#   1044#
SP      =%000006             50#    151#    948     965     1010#   1011#   1012#   1013#   1014#   1015#   1016#   1017    1031#
                           1032    1033    1034    1035    1036    1037    1038
S%R       001050            125#    226     232     496     570     596     625     627     633     656     723     745     782
                            755     777     805     822
TCRLF     005036            888     891#
TEX       005100            886     899#
TIB       001026            113#    911     918#    919     928#    932#    935
TIME      004314            693     729#
TINT      004224             70     704#
TKB       001040            121#    927#    932
TKS       001036            120#    926#    929#    930
TDB       001024            112#    884#    885     887     891#    893#    898
TOG       005064            889     892     894     896#    897
TPB       001044            123#    790#    792#    863#    898#    935#
```

```
TPS      001042           122#    706     861     896     933
TTIN     005152           910     926#
TTIN1    005172           930#    931
TTIN2    005206           933#    934
TTOUT    005004           169     174     186     192     205     217     510     512     587     721     749     751     780
                          782     799     804     825     864#    890     895     1043
TYPT1    004624           840#    850
TYPT2    004632           841#    843
TYPT3    004664           847     849#
ZERO     004766           839#    855     857#    868#
.      = 010213            55#     59      63#     69#     88#     91#     98#     133#    156     869     1041    1045    1058#
```

```
T5T       163     440     462     796     851     859     993
TSTE      766     861     896     930     933
WAIT      699
.ABS        3
.ASCII   1065    1067    1069    1071    1073    1075    1077    1078    1080    1082    1084    1085    1087    1089    1091
         1093    1095    1097    1099    1101    1103    1105    1107    1109    1110    1112    1114    1116    1118    1121
         1123    1125    1127    1129    1131    1133    1135    1137    1139    1140    1141    1143    1144    1146
.BYTE    1055    1056    1057
.END     1147
.EVEN    1054    1058
.REPT      56     209
.TITLE      2


 ERRORS DETECTED:  0
```

```
*LPC11B/I,LPC11B/CRF_LPC11B.SRC
RUN-TIME:  3  7  1 SECONDS
CORE USED:  6K
```