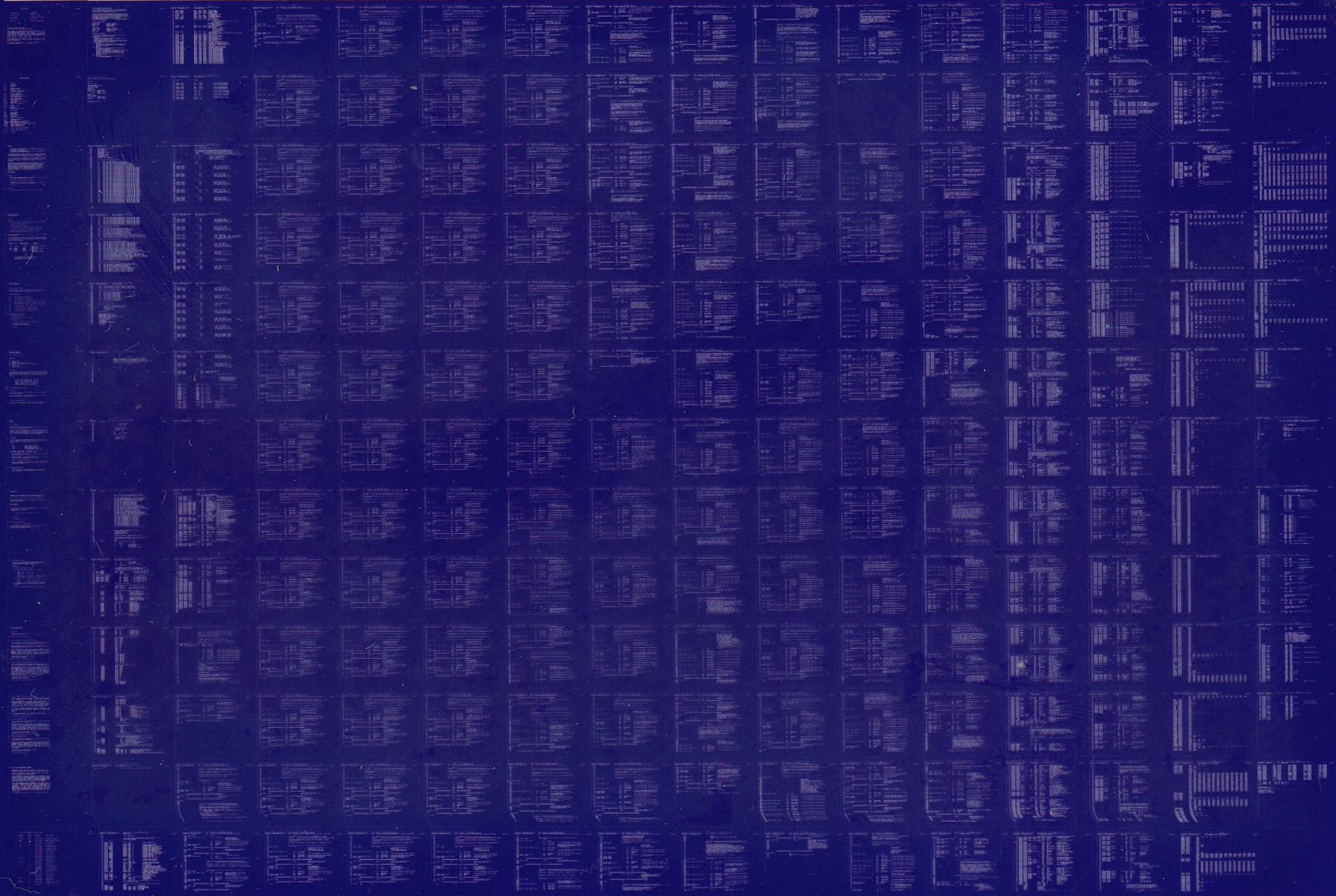
LPA11

LPA/KW11-K TEST
CRLPGC0

AH-B038C-MC
FICHE 1 OF 1

FEB 1981



Identification
****

Product Code:	AC-B037C-MC
Diagnostic Code:	MAINDEC-11-CRLPG-C
Product Name:	CRLPGC0 LPA/KW11K TEST
Date Revised:	DEC. 1980
Maintainer:	DIAGNOSTIC ENGINEERING

Table of Contents
****

1.0 ABSTRACT
****

"C" VERSION OF THE PROGRAM IS DUE TO A CHANGE IN THE MICRO-
CODE IN THE LPA-11 (DMC-11).
"B" VERSION OF THE PROGRAM FIXES LS210 THRU LS230 PROGRAM BUGS
AND SEVERAL DOCUMENTATION ERRORS.

This program allows the user to check out or debug the KW11K, DUAL REAL TIME CLOCK. The logic test is self contained and needs no external maintenance hardware or operator intervention.

Five special tests are included within this program to allow the user to check out and debug the external I/O signals. To run these tests a jumper wires is needed in order to loop output to an input.

THIS PROGRAM IS A MODIFIED VERSION OF 'MD-11-DZKWK-A". IT WAS MODIFIED TO ENABLE THE OPERATOR TO CHECK OUT THE KW11K OPTION WHEN IT IS ON THE LPA11-KX I/O BUS. NO RECABLING IS NEEDED. SOME TEST DONE IN THE ORIGINAL DIAGNOSTIC SUCH AS ARBRITRATION TEST, WERE DELETED AS THEY COULD NOT BE CHECKED. IF THIS DIAGNOSTIC DOESN'T FIND A SUSPECTED PROBLEM, YOU MAY HAVE TO RUN 'MD-11-DZKWK-A". YOU SHOULD RUN 'MD-11-CRLPA" BEFORE RUNNING THIS DIAGNOSTIC. PLEASE READ SECTION 10.

2.0 REQUIREMENTS
****

2.1 Equipment

1. PDP11 FAMILY COMPUTER with 16K of memory or more and I/O facilities (a switch register or TTY).

2. KW11K under test installed in the LPA-11KX.

3. For external I/O signal tests a loopback wire (Jumper) is needed. Jumpers are 30 AWG jumper type 915.

4. LPA11-KX

2.2 Storage

This program occupies and uses only the lower 16K of memory.

3.0 LOADING PROCEDURE
****

3.1 Method

Standards procedure for normal binary tapes should be followed.

1. Absolute loader must be in memory.

2. Place binary tape in reader.

3. Load address *7500 (* determined by location of loader).

4. Press "Start" (program will be loaded into memory).

The program can also be loaded by XXDP, ACT, or APT.

3.2 Non-Standard Address, Vector, or Priority; or Use of Software Switch Register

This program is set to test a KW11K with a standard address, vector, and priority. If any of these are different on the KW11K you are testing, change the corresponding location in memory before starting this test.

```
LOCATION   TAG      CURRENT CONTENTS       COMMENTS
--------   ---      ----------------       --------

  1254     $BASE:        170404          ;;Base address of equipment
                                         ;; under test
  1250    $VECT1:        000344          ;;INTERRUPT Vector #1
  1252   $PRIOR:         000006          ;;Bus priority - 1,#2
  176    $SWREG:         000000          ;Manual SWR.
         $TPFLG:         .BYTE 0         ;;"Terminal Available"
                                         ; Flag (Bit<0:7>=0=Yes)
```

NOTE

If no hardware Switch Register exists, you may set any bit in "SWREG" as you would have set it in the SWR.

4.0 STARTING PROCEDURE
****

4.1 Control Switch Settings

Starting at memory locations 200, 204, 210, 214, 220, 224, 230 or 234, set all switches as desired. See Section 5.1.

4.2 Starting Addresses

200	Start address for logic test.
204	Restart address for logic test.
210	Start address for "STP2 OUT", "SCHMITT TRIG 1" tests.
214	Start address for "STP1 OUT", "SCHMITT TRIG 2" tests.
220	Start address for "SCHMITT TRIG 3 IN", "ST3 OUT" tests.
224	Starting address for "A EVENT OUT" test.
230	Starting address for "B EVENT OUT" test.
234	Starting address for "USER LINK" loop.

4.3 Program AND/OR Operator Action

1. Load program into core.
2. Set switch register to starting address.
3. Load address.
4. Set switches to deisred settings - see section 5.1.
5. If starting a special I/O signal test:
   MAKE WIRE LOOP CONNECTION.
6. Press Start.

5.0 OPERATING PROCEDURE
****

5.1 Switch Register Function

Switch	use
15	Halt on error
14	Loop on test
13	Inhibit error typeout (all tests)
13	Inhibit "*" typeout (special I/O signal tests)
10	Bell on error
9	Loop on error
8	Loop on test in SWR <7:0>

5.2 Scope Loops

If an error occurs and the user wishes to scope the error, he (or she) should set SW15=1 to halt on error, then when the program halts on error, SW15=0, set SW14=1. To loop on current test, set SW13=1 to inhibit error printout, and press continue on the CPU's console.

NOTE

For each test in the listing, you will find a test description. In each description a probable SYNC Point is listed. These Points are listed AS A GUIDE in order for you to SYNC your scope to the Signals being generated.

5.3 Program AND/OR Operator Action

5.3.1 Logic Test

For each pass through the program "END PASS" will be printed out at the end of a pass.

If not inhibited by APT, the program will look for more KW11Ks to exercise, one pass will exercise all KW11Ks.

5.3.2 Special I/O Signal Tests

There are no "Short Passes". Each pass will iterate 65,324 times. A "*" is typed at the end of a pass unless SWR13=1.

6.0 ERRORS
******

6.1 Error Printout

Printout varies with the error detected. The error PC typed out is he actual location of the error call.

A halt at location "$TYPE"+10 when running with no terminal indicates an error has occurred. To find out the number of the error, examine location "$TSTNM". This is the item number of the error. To find out what the error typout would have been GOTO to the error pointer table beginning at location "$ERRTB".

6.1.1 Example

If we examined location "$TSTNM" and found a 5 (101) we go to location "$ERRTB" and look through the error pointer table until we found item 5. The information would look like:

```
;ITEM 5

     EM5                  ;CLOCK B SR DATA ERROR
     DH5                  ;ERRPC   BSR    WAS    S/B
     DT5                  ;$ERRPC,BSR,$BDDAT,$GDDAT
     DF0                  ;ALL NUMBERS ARE IN OCTAL FORM
```

To find out the information specified by DT5 ($ERRPC,BSR,$GDADR,$BDADR) follow these steps:

1. Look uphe address of the label (i.e., $ERRPC) in the symbol table which follows the listing.
2. Put this address in the witch register and depress the load address switch on the processor's console.
3. Now depress the Examine switch.
4. The data displayed in the data lights is the information that would have been printed for his label if you had a input/output terminal.

6.2 Non-Standard Error HALTS

A HALT MAY OCCUR IF THE PROGRAM DETECTS AN LPA11-KX ERROR. CHECK THE COMMENTS IN THE LISTING OPPOSITE THE PC HALT.

7.0 RESTRICTIONS
****

Jumper W2 must be installed if not jumpered on module.
JUMPER W3, W4, AND W5 MUST BE INSTALLED TO RUN SIGNAL TESTS.

Logic Test must be run before any special I/O Signal Test.

The program is chainable under XXDP. However only one pass may be made (R RLPGCO/1).

8.0 MISCELLANEOUS
****

After a power failure occurs, program execution will NOT continue at the point where the power failure occured.
The program will be restarted.

This program is chainable under XXDP, ACT, or APT.

Logic Test

90 SECONDS if no errors.

8.3.2 Special I/O Signal Tests

1.0 Minutes   No errors, SW13=0.

Execution times are approximate, as the various PDP-11 CPU's have varied instruction execution times.
Times quoted were taken from a run on a PDP-11/34.

8.4 USER LINK TO I/O DEVICE

A SPECIAL USER LINK HAS BEEN PROVIDED IN ORDER FOR THE OPERATOR TO EXAMINE OR MODIFY LOCATIONS ON THE LPA11-KX I/O BUS. (NOTE: THIS CANNOT BE DONE DIRECTLY.)

PROCEDURE:

1) START THE PROCESSOR AT LOCATION 234

2) THE DIALOG TO EXAMINE A LOCATION IS AS FOLLOWS:

```
        E OR D           "E"
        DEVICE ADDRS=    "OCTAL ADDRS"
        XXXXXX
```

WHERE XXXXXX IS THE CONTENTS OF THE SPECIFIED LOC.

3) THE DIALOG TO MODIFY A LOCATION IS AS FOLLOWS:

```
        E OR D           "D"
        DATA=            "DATA TO BE DEPOSITED"
```

4) THE PROGRAM WILL STAY IN THIS LOOP UNTIL THE OPERATOR IS FINISHED. AT THIS TIME THE PROCESSOR SHOULD BE HALTED.

NOTE: THE OPERATORS RESPONSE IS ENCLOSED IN QUOTES.

9.0 PROGRAM DESCRIPTION
****

9.1 Logic Tests

A complete description of each test is included withing the listing before each test.

9.2 Special External I/O Signal Tests

9.2.1 LS210 "STP2 OUT" to "SCHMITT RIG 1 IN" Tests

This is a special section devoted for testing and providing scope loop capabilities for "STP2 OUT" L and "SCHMITT TRIG 1" IN.

When you load and start at location 210, program control is transferred here. "STP2 OUT" L pulses are generated by "LO STAT A HI" H + "BD10" H (Main. STP2).

Pin V ("STP2 OUT") is wired to pin LL (SCHMITT TRIG1) for this test. "STP2 OUT" pulses are received as "SCHMITT TRIG 1" pulses which set clock A's status register bit 15. If an error is detected, normal error reporting technique. and error switch register options are used. An "*" is typed after each 65,324 loops through the test. SW13=1 will inhibit this feature.

You must wire pins V and LL of J1 together.
Jumper W3 mist be INSTALLED.

Logic test (L + S 200) should be run first.

9.2.2 LS214 "STP1 OUT" to "SCHMITT RIG 2" H Tests

This is a special test section devoted for testing and providing scope loop capabilities for "STP2 OUT" and "SCHMITT TRIG2" IN.

When you load and start at location 214, program control is transferred here. "STP1 OUT" L pulses are generated by "LD STAT A HI" + "BD12" H (mIn S). Pin DD ("STP1 OUT") is wired to pin BB ("SCHMITT TRIG 2") for this test. "STP1 OUT" pulses are received as "SCHMITT RIG 2" pulses which will clear clock A's count register if mode 3 is selected. If an error is detected, normal error reporting technique. and error switch register options are used. An "*" is typed after each 65,324 loops through the test. SW13=1 will inhibit this feature.

You must wire pins DD and BB of J1 together.
Jumper W4 must be installed.

Logic tests (L + S at 200) should be run first.

9.2.3 LS220 "SCHMITT TRIG 3" in, "ST3 OUT" Tests

This is a special section devoted for testing and providing scope LOOPS CAPABILITIES FOR "SCHMITT TRIG 3" AND "ST3 OUT".

When you load and start at location 220, program control is transferred here. "STP1" pulses are generated by "LD STAT A H," + "BD12" H (main STP1). Pin dd ("STP1 OUT") is wired to pin T ("SCHMITT RIG 3"). "SCHMITT TRIG 3" pulses give us "ST3 OUT" pulses. Pin L ("ST3 OUT") is wired to pin BB ("SCHMITT TRIG2"), and "SCHMITT TRIG 2" will set clock A's status register bit 7.

If an error is detected, normal error reporting technique. and error switch register options are used. An "*" is typed after each 65,324 loops through the test. SW13=1 will inhibit this feature.

You must wire pins DD to T of J1 together, as well as pins L to BB of J1 together. Jumpers W4 and W5 must also be installed.

Tests LS210 and LS214 should be run first.

9.2.4 LS224 "A EVENT OUT" Test

This is a special section devoted for testing and providing scope loop capabilities for "A EVENT OUT".

When you load and start at location 224, program control is transferred here. "A EVENT OUT" pulses are generated by clock A overflows. Pin VV ("A EVENT OUT") is wired to pin BB ("SCHMITT TRIG 2"). "SCHMITT TRIG 2" pulses will set clock A's CSR bit 7. If an error is detected, normal erroporting technique. and error switch register options are used. An "*" is typed after each 65,324 loops through the test. SW13=1 will inhibit this feature.

You must wire pins VV and BB of J1 together.
Jumper W4 must also be installed.

Test LS210 should be run first.

9.2.5 LS230 "B EVENT OUT" Test

This is a special section devoted for testing and providing scope loop capabilities for "B EVENT OUT".

When you load and start at location 230, program control is transferred here. "B EVENT OUT" pulses are generated by clock B overflows. Pin TT ("B EVENT OUT") is wired to pin BB ("SCHMITT TRIG 2"). "SCHMITT TRIG 2" pulses will set clock A's CSR bit 7. And error switch register options are used. An "*" is typed after each 65,324 loops through the test. SW13=1 will inhibit this feature.

You must wire pins TT and BB of J1 together.
Jumper W4 must be installed also.

Test LS210 should be run first.

10.0 LPA11 (SYSTEM) DIAGNOSTIC SUMMARY

DIAGNOSTICS FOR THE LPA11 ARE WRITTEN AT THREE LEVELS: (1) TOTAL PDP-11 SYSTEM, (2) LPA11 SYSTEM; AND, (3) LPA11 OPTIONS.

LEVEL 1, IS DESIGNED TO ISOLATE A FAILURE TO THE LPA11 SYSTEM. ALL OPTIONS ON THE PDP-11 ARE EXERCISED.

LEVEL 2 DIAGNOSTICS ISOLATE A FAILURE TO THE INDIVIDUAL OPTION WITHIN THE LPA11. THE LEVEL 2 DIAGNOSTIC IS MD-11-DRLPA. WHEN THE USER RUNS DRLPA HE CAN GENERALLY TELL WHICH OPTION DIAGNOSTIC (LEVEL 3) TO RUN NEXT. M8254 AND M8200-YC ERRORS MAY "LOOK" ALIKE AND DRLPA MAY NOT BE ABLE TO DISTINGUISH BETWEEN THEM. ARBITRATION ERRORS WILL NOT BE DETECTED BY THIS DIAGNOSTIC.

LEVEL THREE DIAGNOSTICS AID IN DETERMINING IF THE ERROR WAS IN FACT ON THE OPTION THE DRLPA SPECIFIED. THE USER MAY "LOOP" ON THE ERROR. WITHIN LEVEL THREE, THERE ARE TWO GROUPS OF DIAGNOSTICS. THE FIRST GROUP REQUIRES NO "EXTRA" WORK BY THE USER IN ORDER TO RUN. GROUP "A" DIAGNOSTICS DO NOT CHECK ARBITRATION, AND REQUIRE EXTRA TIME FOR EXECUTION. THE SECOND GROUP (GROUP "B") REQUIRES THAT THE USER RECONFIGURE THE PDP-11 SYSTEM. THIS RECONFIGURATION INVOLVES CABLING THE UNIBUS TO THE LPA'S I/O BUS.

THE DIAGNOSTIC FOR THE M8254 FALLS INTO THE GROUP "B" CATAGORY.

THE LPA11-KX DIAGNOSTIC KIT WILL INCLUDE:

OPTION	GROUP	DIAG. #	DIAG. TITLE
LPA11-KX	LEVEL 2	MD-11-CRLPA	LPA11-K SYSTEM EXER.
M8254	"B"	MD-11-CRLPM	M8254 (IPBM) FIELD DIAG.
AA11-K	A	MD-11-CRLPB	LPA/AA11-K DIAG.
	B	MD-11-DZAAC	AA11-K DIAG.
AR11	A	MD-11-CRLPC	LPA/AR11 DIAG. #1
	A	MD-11-CRLPD	LPA/AR11 DIAG. #2
	A	MD-11-CRLPE	LPA/AR11 DIAG. #3
	B	MD-11-DZARA	AR11 DIAG. #1
	B	MD-11-DZARB	AR11 DIAG. #2
	B	MD-11-DZARC	AR11 DIAG. #3
DR11-K	A	MD-11-CRLPF	LPA/DR11-K DIAG.
	B	MD-11-DZDRG	DR11-K DIAG.
KW11-K	A	MD-11-CRLPG	LPA/KW11-K DIAG.
	B	MD-11-DZKWK	KW11-K DIAG.
LPS-11	A	MD-11-CRLPH	LPA/LPS11 DIAG. #1
	A	MD-11-CRLPI	LPA/LPS11 DIAG. #2
	A	MD-11-CRLPJ	LPA/LPS11 DIAG. #3
	B	MD-11-DZLPC	LPS11 DIAG. #1
	B	MD-11-DZLPD	LPS11 DIAG. #2
	B	MD-11-DZLPI	LPS11 DIAG. #3
AD11-K	A	MD-11-CRLPK	LPA/AD11-K DIAG.
	B	MD-11-DZADL	AD11-K DIAG.
M8200-YC	B	MD-11-CRLPL	LPA/DMC-11 DIAG. TST I
	B	MD-11-CRLPM	LPA/DMC-11 DIAG. TST II

```
THIS IS A HISTORY FILE OF CRLPG-C
---------------------------------
THE "C" VERSION SOURCE ONLY HAS THE B TO C VERSION CHANGES
THE BIG CHANGE IS IN THE "CRLPA.MAC" FILE THAT HANDLES THE
NEW VERSION OF THE MICRO-CODE IN THE LPA-11

THE "A" VERSION HAD SEVERAL PROBLEMS WHEN DEALING WITH LS204
AND LS210 THRU LS230. THE FIRST WAS THAT LS204 FAILED TO CLEAR
A LOCATION ".DVLS", WHICH INDICATED THE MICRO-CODE WAS LOADED
AND RUNNING <AFTER A RESTART IS IS NOT RUNNING DUE TO "INIT">.
THIS PROBLEM IS ALSO COMMON TO LS210 THRU LS230.
THE SECOND PROBLEM IS THAT LS210 HAD A DESIGN FLAW <REALLY ONLY A
ONE LINE TYPING REVERSAL>                 JAN 1979  R. SHOOP

HISTORY FILE OF DRLPG-A
-----------------------
PRODUCT CODE:           MAINDEC-11-DZKWK-A
PRODUCT NAME:           KW11-K DIAGNOSTIC TEST
DATE:                   FEBRUARY 1976
MAINTAINER:             DIANOSTIC GROUP

PRODUCT CODE:           MAINDEC-11-DRLPG-A
PRODUCT NAME:           LPA/KW11-K DIAGNOSTIC TEST
DATE:                   JANUARY 1978
MAINTAINER:             DIAGNOSTIC GROUP

REASON FOR DEVELOPMENT:

1) TO ENABLE THE OPERATOR TO CHECK OUT THE KW11-K OPTION
   WHEN IT IS ON THE LPA11-KX I/O BUS.
CHANGES MADE:
1) TOOK OUT CERTAIN TESTS FROM ORIGINAL DIAGNOSTIC (I.E.
   INTERRUPTS,TIME DEPENDENT CODE).
2) REPLACED DIRECT LINKS TO DEVICE WITH MACRO CALLS TO THE
   KMC-11 MICRO CODE. KMC-11 MICRO CODE (FILE:DRLPX2) HANDLES
   DIRECT COMMUNICATIONS WITH THE DEVICE.
FILE: DRLPA.MAC
      CONTAINS MACRO LINKS BETWEEN PDP-11 CODE AND KMC-11
      MICRO CODE. FILE: DRLPX2 NEEDS TO BE ASSEMBLED WITH
      DRLPG (SEE .CTL FILE).
FILE: DRLPX2
      MICRO CODE FILE THAT GETS LOADED INTO THE KMC-11
      VIA ROUTINES IN DRLPA.MAC.
      DRLPX2.P11 IS ASSEMBLED WITH MACY11 (ONLY) AS ANY OTHER
      .P11 FILE. THE RESULTS OF ITS ASSEMBLY IS A .OBJ
      MODULE AS WAS THE RESULT OF THE ASSEMBLY OF THE
      DIAGNOSTIC .P11 FILE. BOTH .OBJ FILES GET LINKED
      WITH LNKX11 (ONLY).
FILE: DRLPG.CTL
      THIS FILE EXPLAINS SEQUENCE OF ASSEMBLES AND LINKS.
      IT IS IN TOPS-20 FORMAT.
```

```
LNKX11   V023   24-OCT-80   9:45                                                         SEQ 0015

#CRLPGC.BIN/B:42000,CRLPGC.MAP=CRLPGC,CRLPX2/E


LOAD MAP

IDENT:  V1015B

TRANSFER ADDRESS: 000001
LOW LIMIT: 042000
HIGH LIMIT: 046000
**********
MODULE  LPA
SECTION ENTRY    ADDRESS SIZE
<. ABS.>         000000  000000
        DRLPX2   042000
<      >         042000  000000
**********
MODULE  DRLPX2
SECTION ENTRY    ADDRESS SIZE
<      >         042000  000000
<ABCODE>         042000  004000


 RUN-TIME:  1 SECONDS
 2K CORE USED
```

```
                .REM    [

                                  CRLPAB.MAC

WELCOME, THIS DIAGNOSTIC IS ONE IN A SERIES OF DIAGNOSTIC
DESIGNED IN ORDER TO AID YOU IN TESTING THE LPA-11XX OPTION.
I HOPE THAT YOU HAVE READ THE DOCUMENTATION SECTION OF THIS
DIAGNOSTIC.  IF YOU HAVE,YOU KNOW ABOUT ALL OF THE DIAGNOSTICS
THAT ARE AVAILIBLE FOR TESTING THE LPA SYSTEM.

                                  GOOD LUCK !

[
.GLOBL  DRLPX2
```

```
                              .TITLE  MMAST.MAC
                              .IDENT  /4.01/
                      ;
                      ; LPA11-K MICRO CODE
                      ;
                      ; CHARLES A. SAMUELSON
                      ; NOVEMBER, 1977
                      ;

                              .TITLE  DMAST.MAC
                              .IDENT  /4.01/
                      ;
                      ; LPA11-K MICRO CODE
                      ;
                      ; CHARLES A. SAMUELSON
                      ; NOVEMBER, 1977
                      ;

```

```
                                .REM    !

                        THIS IS A LIST OF TESTS DELETED FROM THIS DIAGNOSTIC.
                        THESE TEST COULD NOT BE DONE THROUGH THE LPA-11.

                        TEST THE LOW BYTE OPERATION OF CLOCK A'S STATUS REGISTER
                        TEST THE HIGH BYTE OPERATION OF A'S STATUS REGISTER
                        TEST THE LOW BYTE OPERATION OF B'S STATUS REGISTER
                        TEST THE HIGH BYTE OPERATION OF B'STATUS REGISTER
                        TEST THAT INIT CLEARS STATUS REGISTER A
                        TEST THAT INIT CLEARS BUFFER REGISTER A
                        TEST THAT INIT CLEARS STATUS REGISTER B
                        TEST THAT INIT CLEARS BUFFER REGISTER B
                        TEST THAT A'S COUNT REGISTER IS CLEARED BY INIT
                        TEST THAT CLOCK A WILL INTR. AND TO THE RIGHT VECTOR
                        TEST THAT CLOCK A WILL INTR. WHEN CPU PSW = CLK INTR LEV -1
                        TEST THAT CLOCK A WILL NOT INTR. WHEN CPU PSW = CLK INTR LEVEL
                        TEST THAT ST1 WILL CAUSE CLOCK A TO INTER.
                        TEST THAT CLOCK A OVERFLOW WILL CAUSE AN INTR.
                        TEST THAT A CLOCK A COUNTER BUFFER WILL CAUSES AN INTR.
                        TEST THAT CLOCK B WILL INTR. AND TO THE RIGHT VECTOR
                        TEST THAT CLOCK B WILL INTR. WHEN CPU PSW=CLK INTR LEV -1
                        TEST THAT CLOCK B WILL NOT INTR. WHEN CPU PSW=CLK INTR LEVEL
                        TEST THAT A CLOCKB OVERFLOW WILL CAUSE AN INTR.
                        TEST CLOCK A'S REPEATIBILITY AT 1MHZ RATE
                        TEST CLOCK A'S REPEATIBILITY AT 100KHZ RATE
                        TEST CLOCK A'S REPEATIBILITY AT 10KHZ RATE
                        TEST CLOCK A'S REPEATIBILITY AT 1KHZ RATE
                        TEST CLOCK A'S REPEATIBILITY AT 100HZ RATE
                        TEST CLOCK B'S REPEATIBILITY AT 1MHZ RATE
                        TEST CLOCK B'S REPEATIBILITY AT 100KHZ RATE
                        TEST CLOCK B'S REPEATIBILITY AT 10KHZ RATE
                        TEST CLOCK B'S REPEATIBILITY AT 1KHZ RATE
                        TEST CLOCK B'S REPEATIBILITY AT 100HZ RATE
                        TEST THAT "INIT" CLEARS B'S 100KHZ DIVIDE BY 10 CHIPS
                                !



                        .TITLE  LPA-KW11K DIAGNOSTIC MD-11-CRLPG-C
                        ;*COPYRIGHT (C) 1980
                        ;*DIGITAL EQUIPMENT CORP.
                        ;*MAYNARD, MASS. 01754
                        ;*
                        ;*PROGRAM BY EDWARD C. BADGER REV B BY R. SHOOP
                        ;*
                        ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
                        ;*PACKAGE (MAINDEC-11-DZQAC-C3), JAN 19, 1977.
                        ;*
        000001          $TN=1
                        .SBTTL  OPERATIONAL SWITCH SETTINGS
                        ;*
                        ;*      SWITCH              USE
                        ;*      ------        -------------------
                        ;*        15          HALT ON ERROR
                        ;*        14          LOOP ON TEST
                        ;*        13          INHIBIT ERROR TYPEOUTS
```

```
                                ;*      10              BELL ON ERROR
                                ;*       9              LOOP ON ERROR
                                ;*       8              LOOP ON TEST IN SWR<7:0>
                                .SBTTL  TRAP CATCHER

        000000                          .=0
                                ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
                                ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
                                ;*LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
        000174                          .=174
000174  000000                  DISPREG: .WORD  0                       ;;SOFTWARE DISPLAY REGISTER
000176  000000                  SWREG:   .WORD  0                       ;;SOFTWARE SWITCH REGISTER
        000200                          .=200
000200  000137  001726                  JMP     @#START                 ;GO TO STARTING ADDRESS OF PROGRAM

000204  000137  002462                  JMP     @#RSTART                ;GO TO RESTART ADDRESS.
000210  000137  022450                  JMP     @#LS210                 ;GO TO SPECIAL TEST #1.
000214  000137  022646                  JMP     @#LS214                 ;GO TO SPECIAL TEST #2.
000220  000137  023062                  JMP     @#LS220                 ;GO TO SPECIAL TEST #3.
000224  000137  023246                  JMP     @#LS224                 ;GO TO SPECIAL TEST #4.
000230  000137  023454                  JMP     @#LS230                 ;GO TO SPECIAL TEST #5.

                                .SBTTL  BASIC DEFINITIONS


                                ;*INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***
        001100                  STACK=  1100
                                .EQUIV  EMT,ERROR               ;;BASIC DEFINITION OF ERROR CALL
                                .EQUIV  IOT,SCOPE               ;;BASIC DEFINITION OF SCOPE CALL

                                ;*MISCELLANEOUS DEFINITIONS
        000011                  HT=     11                      ;;CODE FOR HORIZONTAL TAB
        000012                  LF=     12                      ;;CODE FOR LINE FEED
        000015                  CR=     15                      ;;CODE FOR CARRIAGE RETURN
        000200                  CRLF=   200                     ;;CODE FOR CARRIAGE RETURN-LINE FEED
        177776                  PS=     177776                  ;;PROCESSOR STATUS WORD
                                .EQUIV  PS,PSW
        177774                  STKLMT= 177774                  ;;STACK LIMIT REGISTER
        177772                  PIRQ=   177772                  ;;PROGRAM INTERRUPT REQUEST REGISTER
        177570                  DSWR=   177570                  ;;HARDWARE SWITCH REGISTER
        177570                  DDISP=  177570                  ;;HARDWARE DISPLAY REGISTER


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


                                ;*PRIORITY LEVEL DEFINITIONS
        000000                  PR0=    0                       ;;PRIORITY LEVEL 0
        000040                  PR1=    40                      ;;PRIORITY LEVEL 1
```

```
    (1)         000100          PR2=    100             ;;PRIORITY LEVEL 2
    (1)         000140          PR3=    140             ;;PRIORITY LEVEL 3
    (1)         000200          PR4=    200             ;;PRIORITY LEVEL 4
    (1)         000240          PR5=    240             ;;PRIORITY LEVEL 5
    (1)         000300          PR6=    300             ;;PRIORITY LEVEL 6
    (1)         000340          PR7=    340             ;;PRIORITY LEVEL 7
    (1)
    (1)                         ;*"SWITCH REGISTER" SWITCH DEFINITIONS
    (1)         100000          SW15=   100000
    (1)         040000          SW14=   40000
    (1)         020000          SW13=   20000
    (1)         010000          SW12=   10000
    (1)         004000          SW11=   4000
    (1)         002000          SW10=   2000
    (1)         001000          SW09=   1000
    (1)         000400          SW08=   400
    (1)         000200          SW07=   200
    (1)         000100          SW06=   100
    (1)         000040          SW05=   40
    (1)         000020          SW04=   20
    (1)         000010          SW03=   10
    (1)         000004          SW02=   4
    (1)         000002          SW01=   2
    (1)         000001          SW00=   1
    (1)                         .EQUIV  SW09,SW9
    (1)                         .EQUIV  SW08,SW8
    (1)                         .EQUIV  SW07,SW7
    (1)                         .EQUIV  SW06,SW6
    (1)                         .EQUIV  SW05,SW5
    (1)                         .EQUIV  SW04,SW4
    (1)                         .EQUIV  SW03,SW3
    (1)                         .EQUIV  SW02,SW2
    (1)                         .EQUIV  SW01,SW1
    (1)                         .EQUIV  SW00,SW0
    (1)
    (1)                         ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
    (1)         100000          BIT15=  100000
    (1)         040000          BIT14=  40000
    (1)         020000          BIT13=  20000
    (1)         010000          BIT12=  10000
    (1)         004000          BIT11=  4000
    (1)         002000          BIT10=  2000
    (1)         001000          BIT09=  1000
    (1)         000400          BIT08=  400
    (1)         000200          BIT07=  200
    (1)         000100          BIT06=  100
    (1)         000040          BIT05=  40
    (1)         000020          BIT04=  20
    (1)         000010          BIT03=  10
    (1)         000004          BIT02=  4
    (1)         000002          BIT01=  2
    (1)         000001          BIT00=  1
    (1)                         .EQUIV  BIT09,BIT9
    (1)                         .EQUIV  BIT08,BIT8
    (1)                         .EQUIV  BIT07,BIT7
    (1)                         .EQUIV  BIT06,BIT6
```

```
                        .EQUIV  BIT05,BIT5
                        .EQUIV  BIT04,BIT4
                        .EQUIV  BIT03,BIT3
                        .EQUIV  BIT02,BIT2
                        .EQUIV  BIT01,BIT1
                        .EQUIV  BIT00,BIT0

                        ;*BASIC "CPU" TRAP VECTOR ADDRESSES
        000004          ERRVEC= 4                       ;;TIME OUT AND OTHER ERRORS
        000010          RESVEC= 10                      ;;RESERVED AND ILLEGAL INSTRUCTIONS
        000014          TBITVEC=14                      ;;"T" BIT
        000014          TRTVEC= 14                      ;;TRACE TRAP
        000014          BPTVEC= 14                      ;;BREAKPOINT TRAP (BPT)
        000020          IOTVEC= 20                      ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
        000024          PWRVEC= 24                      ;;POWER FAIL
        000030          EMTVEC= 30                      ;;EMULATOR TRAP (EMT) **ERROR**
        000034          TRAPVEC=34                      ;;"TRAP" TRAP
        000060          TKVEC=  60                      ;;TTY KEYBOARD VECTOR
        000064          TPVEC=  64                      ;;TTY PRINTER VECTOR
        000240          PIRQVEC=240                     ;;PROGRAM INTERRUPT REQUEST VECTOR
        170404                  ABASE=  170404
        000344                  AVECT1= 344
        000006                  APRIOR= 6

                        .SBTTL  ACT11 HOOKS

                        ;;*************************************************************
                        ;HOOKS REQUIRED BY ACT11
        000234                  $SVPC=.                         ;SAVE PC
        000046                  .=46
000046  022414                  $ENDAD                          ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
        000052                  .=52
000052  000000                  .WORD   0                       ;;2)SET LOC.52 TO ZERO
        000234                  .=$SVPC                         ;; RESTORE PC
        001000                  .=1000
                        .SBTTL  APT PARAMETER BLOCK

                        ;;*************************************************************
                        ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
                        ;;*************************************************************
        001000                  .$X=.   ;;SAVE CURRENT LOCATION
        000024                  .=24    ;;SET POWER FAIL TO POINT TO START OF PROGRAM
000024  000200                  200     ;;FOR APT START UP
        000044                  .=44    ;;POINT TO APT INDIRECT ADDRESS PNTR.
000044  001000                  $APTHDR ;;POINT TO APT HEADER BLOCK
        001000                  .=.$X   ;;RESET LOCATION COUNTER
                        ;;*************************************************************
                        ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
                        ;INTERFACE SPEC.

001000                  $APTHD:
001000  000000          $HIBTS: .WORD   0       ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
001002  001200          $MBADR: .WORD   $MAIL   ;;ADDRESS OF APT MAILBOX (BITS 0-15)
001004  000002          $TSTM:  .WORD   2       ;;RUN TIM OF LONGEST TEST
001006  000120          $PASTM: .WORD   120     ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
001010  000120          $UNITM: .WORD   120     ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
```

```
 (1)  001012  000052                    .WORD   $ETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)
1278
```

```
                                .SBTTL  COMMON TAGS
 (1)
 (2)                            ;;*****************************************************************
 (1)                            ;*THIS TABLE CONTAINS VARIOUS COMMON STORAGE LOCATIONS
 (1)                            ;*USED IN THE PROGRAM.
 (1)
 (1)             001100                 .=1100
 (1)    001100                  $CMTAG:                                ;;START OF COMMON TAGS
 (1)    001100   000000                 .WORD   0
 (1)    001102      000         $TSTNM: .BYTE   0                      ;;CONTAINS THE TEST NUMBER
 (1)    001103      000         $ERFLG: .BYTE   0                      ;;CONTAINS ERROR FLAG
 (1)    001104   000000         $ICNT:  .WORD   0                      ;;CONTAINS SUBTEST ITERATION COUNT
 (1)    001106   000000         $LPADR: .WORD   0                      ;;CONTAINS SCOPE LOOP ADDRESS
 (1)    001110   000000         $LPERR: .WORD   0                      ;;CONTAINS SCOPE RETURN FOR ERRORS
 (1)    001112   000000         $ERTTL: .WORD   0                      ;;CONTAINS TOTAL ERRORS DETECTED
 (1)    001114      000         $ITEMB: .BYTE   0                      ;;CONTAINS ITEM CONTROL BYTE
 (1)    001115      001         $ERMAX: .BYTE   1                      ;;CONTAINS MAX. ERRORS PER TEST
 (1)    001116   000000         $ERRPC: .WORD   0                      ;;CONTAINS PC OF LAST ERROR INSTRUCTION
 (1)    001120   000000         $GDADR: .WORD   0                      ;;CONTAINS ADDRESS OF 'GOOD' DATA
 (1)    001122   000000         $BDADR: .WORD   0                      ;;CONTAINS ADDRESS OF 'BAD' DATA
 (1)    001124   000000         $GDDAT: .WORD   0                      ;;CONTAINS 'GOOD' DATA
 (1)    001126   000000         $BDDAT: .WORD   0                      ;;CONTAINS 'BAD' DATA
 (1)    001130   000000                 .WORD   0                      ;;RESERVED--NOT TO BE USED
 (1)    001132   000000                 .WORD   0
 (1)    001134      000         $AUTOB: .BYTE   0                      ;;AUTOMATIC MODE INDICATOR
 (1)    001135      000         $INTAG: .BYTE   0                      ;;INTERRUPT MODE INDICATOR
 (1)    001136   000000                 .WORD   0
 (1)    001140   177570         SWR:    .WORD   DSWR                   ;;ADDRESS OF SWITCH REGISTER
 (1)    001142   177570         DISPLAY: .WORD  DDISP                  ;;ADDRESS OF DISPLAY REGISTER
 (1)    001144   177560         $TKS:   177560                         ;;TTY KBD STATUS
 (1)    001146   177562         $TKB:   177562                         ;;TTY KBD BUFFER
 (1)    001150   177564         $TPS:   177564                         ;;TTY PRINTER STATUS REG. ADDRESS
 (1)    001152   177566         $TPB:   177566                         ;;TTY PRINTER BUFFER REG. ADDRESS
 (1)    001154      000         $NULL:  .BYTE   0                      ;;CONTAINS NULL CHARACTER FOR FILLS
 (1)    001155      002         $FILLS: .BYTE   2                      ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
 (1)    001156      012         $FILLC: .BYTE   12                     ;;INSERT FILL CHARS. AFTER A "LINE FEED"
 (1)    001157      000         $TPFLG: .BYTE   0                      ;;"TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
 (1)    001160   000000         $REGAD: .WORD   0                      ;;CONTAINS THE ADDRESS FROM
 (1)                                                                   ;;WHICH  ($REG0) WAS OBTAINED
 (3)    001162   000000         $REG0:  .WORD   0                      ;;CONTAINS (($REGAD)+0)
 (3)    001164   000000         $TMP0:  .WORD   0                      ;;USER DEFINED
 (1)    001166   000000         $ESCAPE:0                              ;;ESCAPE ON ERROR ADDRESS
 (1)    001170   177607  000377 $BELL:  .ASCIZ  <207><377><377>        ;;CODE FOR BELL
 (1)    001174      077         $QUES:  .ASCII  /?/                    ;;QUESTION MARK
 (1)    001175      015         $CRLF:  .ASCII  <15>                   ;;CARRIAGE RETURN
 (1)    001176   000012         $LF:    .ASCIZ  <12>                   ;;LINE FEED
 (2)                            ;;*****************************************************************
 (2)                            .SBTTL  APT MAILBOX-ETABLE
 (2)
 (3)                            ;;*****************************************************************
 (2)                            .EVEN
 (2)    001200                  $MAIL:                  ;;APT MAILBOX
 (2)    001200   000000         $MSGTY: .WORD   AMSGTY  ;;MESSAGE TYPE CODE
 (2)    001202   000000         $FATAL: .WORD   AFATAL  ;;FATAL ERROR NUMBER
 (2)    001204   000000         $TESTN: .WORD   ATESTN  ;;TEST NUMBER
 (2)    001206   000000         $PASS:  .WORD   APASS   ;;PASS COUNT
```

```
(2)  001210  000000          $DEVCT: .WORD   ADEVCT  ;;DEVICE COUNT
(2)  001212  000000          $UNIT:  .WORD   AUNIT   ;;I/O UNIT NUMBER
(2)  001214  000000          $MSGAD: .WORD   AMSGAD  ;;MESSAGE ADDRESS
(2)  001216  000000          $MSGLG: .WORD   AMSGLG  ;;MESSAGE LENGTH
(2)  001220                  $ETABLE:                ;;APT ENVIRONMENT TABLE
(2)  001220     000          $ENV:   .BYTE   AENV    ;;ENVIRONMENT BYTE
(2)  001221     000          $ENVM:  .BYTE   AENVM   ;;ENVIRONMENT MODE BITS
(2)  001222  000000          $SWREG: .WORD   ASWREG  ;;APT SWITCH REGISTER
(2)  001224  000000          $USWR:  .WORD   AUSWR   ;;USER SWITCHES
(2)  001226  000000          $CPUOP: .WORD   ACPUOP  ;;CPU TYPE,OPTIONS
(2)                          ;*                      BITS 15-11=CPU TYPE
(2)                          ;*                              11/04=01,11/05=02,11/20=03,11/40=04,11/45=05
(2)                          ;*                              11/70=06,PDQ=07,Q=10
(2)                          ;*                      BIT 10=REAL TIME CLOCK
(2)                          ;*                      BIT  9=FLOATING POINT PROCESSOR
(2)                          ;*                      BIT  8=MEMORY MANAGEMENT
(2)  001230     000          $MAMS1: .BYTE   AMAMS1  ;;HIGH ADDRESS,M.S. BYTE
(2)  001231     000          $MTYP1: .BYTE   AMTYP1  ;;MEM. TYPE,BLK#1
(2)                          ;*                      MEM.TYPE BYTE   --  (HIGH BYTE)
(2)                          ;*                              900 NSEC CORE=001
(2)                          ;*                              300 NSEC BIPOLAR=002
(2)                          ;*                              500 NSEC MOS=003
(2)  001232  000000          $MADR1: .WORD   AMADR1  ;;HIGH ADDRESS,BLK#1
(2)                          ;*                        MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF "TYPE" ABOVE
(2)  001234     000          $MAMS2: .BYTE   AMAMS2  ;;HIGH ADDRESS,M.S. BYTE
(2)  001235     000          $MTYP2: .BYTE   AMTYP2  ;;MEM.TYPE,BLK#2
(2)  001236  000000          $MADR2: .WORD   AMADR2  ;;MEM.LAST ADDRESS,BLK#2
(2)  001240     000          $MAMS3: .BYTE   AMAMS3  ;;HIGH ADDRESS,M.S.BYTE
(2)  001241     000          $MTYP3: .BYTE   AMTYP3  ;;MEM.TYPE,BLK#3
(2)  001242  000000          $MADR3: .WORD   AMADR3  ;;MEM.LAST ADDRESS,BLK#3
(2)  001244     000          $MAMS4: .BYTE   AMAMS4  ;;HIGH ADDRESS,M.S.BYTE
(2)  001245     000          $MTYP4: .BYTE   AMTYP4  ;;MEM.TYPE,BLK#4
(2)  001246  000000          $MADR4: .WORD   AMADR4  ;;MEM.LAST ADDRESS,BLK#4
(2)  001250  000344          $VECT1: .WORD   AVECT1  ;;INTERRUPT VECTOR#1,BUS PRIORITY#1
(2)  001252  000000          $VECT2: .WORD   AVECT2  ;;INTERRUPT VECTOR#2BUS PRIORITY#2
(2)  001254  170404          $BASE:  .WORD   ABASE   ;;BASE ADDRESS OF EQUIPMENT UNDER TEST
(2)  001256  000000          $DEVM:  .WORD   ADEVM   ;;DEVICE MAP
(2)  001260  000000          $CDW1:  .WORD   ACDW1   ;;CONTROLLER DESCRIPTION WORD#1
(2)  001262  000000          $CDW2:  .WORD   ACDW2   ;;CONTROLLER DESCRIPTION WORD#2
(2)  001264  000000          $DDW0:  .WORD   ADDW0   ;;DEVICE DESCRIPTOR WORD#0
(2)  001266  000000          $DDW1:  .WORD   ADDW1   ;;DEVICE DESCRIPTOR WORD#1
(2)  001270  000000          $DDW2:  .WORD   ADDW2   ;;DEVICE DESCRIPTOR WORD#2
(2)  001272  000000          $DDW3:  .WORD   ADDW3   ;;DEVICE DESCRIPTOR WORD#3
(2)  001274  000000          $DDW4:  .WORD   ADDW4   ;;DEVICE DESCRIPTOR WORD#4
(2)  001276  000000          $DDW5:  .WORD   ADDW5   ;;DEVICE DESCRIPTOR WORD#5
(2)  001300  000000          $DDW6:  .WORD   ADDW6   ;;DEVICE DESCRIPTOR WORD#6
(2)  001302  000000          $DDW7:  .WORD   ADDW7   ;;DEVICE DESCRIPTOR WORD#7
(2)  001304  000000          $DDW8:  .WORD   ADDW8   ;;DEVICE DESCRIPTOR WORD#8
(2)  001306  000000          $DDW9:  .WORD   ADDW9   ;;DEVICE DESCRIPTOR WORD#9
(2)  001310  000000          $DDW10: .WORD   ADDW10  ;;DEVICE DESCRIPTOR WORD#10
(2)  001312  000000          $DDW11: .WORD   ADDW11  ;;DEVICE DESCRIPTOR WORD#11
(2)  001314  000000          $DDW12: .WORD   ADDW12  ;;DEVICE DESCRIPTOR WORD#12
(2)  001316  000000          $DDW13: .WORD   ADDW13  ;;DEVICE DESCRIPTOR WORD#13
(2)  001320  000000          $DDW14: .WORD   ADDW14  ;;DEVICE DESCRIPTOR WORD#14
(2)  001322  000000          $DDW15: .WORD   ADDW15  ;;DEVICE DESCRIPTOR WORD#15
(2)
```

```
   (2)
   (2)  001324                          $ETEND:
   (2)
   (3)
   (3)  001324  170404                  ASR:     170404                 ;/CLOCK A STATUS REGISTER.
   (3)  001326  170406                  ABR:     170406                 ;/CLOCK A BUFFER REGISTER.
   (3)  001330  170430                  ACR:     170430                 ;/CLOCK A COUNT REGISTER.
   (3)
   (3)  001332  170432                  BSR:     170432                 ;/CLOCK B STATUS REGISTER.
   (3)  001334  170434                  BBR:     170434                 ;/CLOCK B BUFFER REGISTER.
   (3)  001336  170436                  BCR:     170436                 ;/CLOCK B COUNT REGISTER.
   (3)
   (3)  001340  000344                  AVECT:  344                     ;/CLOCK A INTR. VECTOR ADDR.
   (3)  001342  000346                  AVECP2: 346                     ;/CLOCK A INTR. STATUS WORD.
   (3)
   (3)  001344  000364                  BVECT:  364                     ;/CLOCK B INTR. VECTOR ADDR.
   (3)  001346  000366                  BVECT2: 366                     ;/CLOCK B INTR. STATUS WORD.
   (3)
   (3)  001350  000006                  APRITY: 6                       ;/PRIORITY LEVEL OF CLOCK A.
   (3)  001352  000006                  BPRITY: 6                       ;/PRIORITY LEVEL OF CLOCK B.
   (3)  001354  000000                  $TMDAT: 0
   (3)
   (3)
```

```
(1)                           .SBTTL  ERROR POINTER TABLE
(1)
(1)                           ;*THIS TABLE CONTAINS THE INFORMATION FOR EACH ERROR THAT CAN OCCUR.
(1)                           ;*THE INFORMATION IS OBTAINED BY USING THE INDEX NUMBER FOUND IN
(1)                           ;*LOCATION $ITEMB. THIS NUMBER INDICATES WHICH ITEM IN THE TABLE IS PERTINENT.
(1)                           ;*NOTE1:        IF $ITEMB IS 0 THE ONLY PERTINENT DATA IS ($ERRPC).
(1)                           ;*NOTE2:        EACH ITEM IN THE TABLE CONTAINS 4 POINTERS EXPLAINED AS FOLLOWS:
(1)
(1)                           ;*      EM              ;;POINTS TO THE ERROR MESSAGE
(1)                           ;*      DH              ;;POINTS TO THE DATA HEADER
(1)                           ;*      DT              ;;POINTS TO THE DATA
(1)                           ;*      DF              ;;POINTS TO THE DATA FORMAT
(1)
(1)
(1)  001356                   $ERRTB:

                              ;ITEM   1

     001356  027166                   EM1                             ;CLOCK A SR FUNCTION ERROR
     001360  030053                   DH1                             ;ERRPC    ASR      WAS      S/B
     001362  030666                   DT1                             ;$ERRPC,ASR,$BDDAT,$GDDAT
     001364  031070                   DF0                             ;ALL NUMBERS ARE IN OCTAL FORM
(1)

                              ;ITEM   2

     001366  027221                   EM2                             ;CLOCKA SR DATA ERROR
     001370  030053                   DH1                             ;ERRPC    ASR      WAS      S/B
     001372  030666                   DT1                             ;$ERRPC,ASR,$BDDAT,$GDDAT
     001374  031070                   DF0                             ;ALL NUMBERS ARE IN OCTAL FORM
(1)

                              ;ITEM   3

     001376  027250                   EM3                             ;CLOCKA BR DATA ERROR
     001400  030111                   DH3                             ;ERRPC    ABR      WAS      S/B
     001402  030700                   DT3                             ;$ERRPC,ABR,$BDDAT,$GDDAT
     001404  031070                   DF0                             ;ALL NUMBERS ARE IN OCTAL FORM
(1)

                              ;ITEM   4

     001406  027277                   EM4                             ;CLOCKA CR DATA ERROR
     001410  030147                   DH4                             ;ERRPC    ACR      WAS      S/B
     001412  030712                   DT4                             ;$ERRPC,ACR,$BDDAT,$GDDAT
     001414  031070                   DF0                             ;ALL NUMBERS ARE IN OCTAL FORM
(1)

                              ;ITEM   5

     001416  027326                   EM5                             ;CLOCK B SR DATA ERROR
     001420  030205                   DH5                             ;ERRPC    BSR      WAS      S/B
     001422  030724                   DT5                             ;$ERRPC,BSR,$BDDAT,$GDDAT
     001424  031070                   DF0                             ;ALL NUMBERS ARE IN OCTAL FORM
(1)

```

```
                                ;ITEM   6

001426  027355                          EM6                     ;CLOCK B BR DATA ERROR
001430  030243                          DH6                     ;ERRPC   BBR      WAS      S/B
001432  030736                          DT6                     ;$ERRPC,BBR,$BDDAT,$GDDAT
001434  031070                          DFO                     ;ALL NUMBERS ARE IN OCTAL FORM


                                ;ITEM.  7

001436  027404                          EM7                     ;CLOCK B CR DATA ERROR
001440  030301                          DH7                     ;ERRPC   BCR      WAS      S/B
001442  030750                          DT7                     ;$ERRPC,BCR,$BDDAT,$GDDAT
001444  031070                          DFO                     ;ALL NUMBERS ARE IN OCTAL FORM


                                ;ITEM   10

001446  027433                          EM10                    ;DUAL ADDRESS ERROR
001450  030337                          DH10                    ;ERROR    GOOD   BAD     GOOD    DATA READ FROM
                                                                ;  PC     ADDR   ADDR    DATA    DUAL ADDRESS
001452  030762                          DT10                    ;$ERRPC,$GDADR,$BDADR,$GDDAT,$BDDAT
001454  031070                          DFO                     ;ALL NUMBERS ARE IN OCTAL FORM


                                ;ITEM   11

001456  027460                          EM11                    ;CLOCK A COUNT ERROR
001460  030147                          DH4                     ;ERRPC    ACR    WAS   S/B
001462  030712                          DT4                     ;$ERRPC, ACR, $BDDAT, $GDDAT
001464  031070                          DFO                     ;ALL NUMBERS ARE IN OCTAL FORM


                                ;ITEM   12

001466  027507                          EM12                    ;CLOCK A COUNT FUNCTION ERROR
001470  030476                          DH12                    ;ERRPC    ASR
001472  030776                          DT12                    ;ERRPC, ASR
001474  031070                          DFO                     ;ALL NUMBERS ARE IN OCTAL FORM


                                ;ITEM   13

001476  031070                          DFO                     ;ERROR 13 DOES NOT EXSIST.
001500  031070                          DFO                     ;IT WOULD BE BAD LUCK.
001502  031070                          DFO
001504  031070                          DFO

                                ;ITEM   14

001506  027547                          EM14                    ;CLOCK B COUNT FUNCTION ERROR
001510  030515                          DH14                    ;ERRPC   BSR
001512  031004                          DT14                    ;$ERRPC, BSR
001514  031070                          DFO                     ;ALL NUMBERS ARE IN OCTAL FORM

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                                    ;ITEM   15

      001516  027607                        EM15                        ;CLOCK B COUNT ERROR
      001520  030301                        DH7                         ;ERRPC   CSR   WAS   S/B
      001522  030750                        DT7                         ;$ERRPC, BCR, $BDDAT, $GDDAT
      001524  031070                        DFO                         ;ALL NUMBERS ARE IN OCTAL FORM
 (1)

                                    ;ITEM   16

      001526  027636                        EM16                        ;CLOCK A INTERRUPT ERROR
      001530  030476                        DH12                        ;ERRPC   ASR
      001532  030776                        DT12                        ;$ERRPC, ASR
      001534  031070                        DFO                         ;ALL NUMBERS ARE IN OCTAL FORM
 (1)

                                    ;ITEM   17

      001536  027671                        EM17                        ;CLOCK B INTERRUPT ERROR
      001540  030515                        DH14                        ;ERRPC   BSR
      001542  031004                        DT14                        ;$ERRPC, BSR
      001544  031070                        DFO

                                    ;ITEM   20

      001546  027724                        EM20                        ;CLOCK A REPEATABILITY ERROR
      001550  030533                        DH20                        ;ERROR   ASR   2ND CNT 1ST CNT
      001552  030666                        DT1                         ;$ERRPC, ASR, $BDDAT, $GDDAT
      001554  031070                        DFO                         ;ALL NUMBERS ARE IN OCTAL FORM
 (1)

                                    ;ITEM   21

      001556  027460                        EM11                        ;CLOCK A COUNT ERROR
      001560  030147                        DH4                         ;ERROR   ASR   2ND CNT 1ST CNT
      001562  031012                        DT21                        ;$ERRPC, ASR, $BDDAT, $GDDAT
      001564  031070                        DFO                         ;ALL NUMBERS ARE IN OCTAL FORM
 (1)

                                    ;ITEM   22

      001566  027460                        EM11                        ;CLOCK A COUNT ERROR
      001570  030147                        DH4                         ;ERRPC   ASR   WAS   S/B
      001572  031024                        DT22                        ;$ERRPC, ACR, $BDDAT, $TMPO
      001574  031070                        DFO                         ;ALL NUMBERS ARE IN OCTAL FORM
 (1)

                                    ;ITEM   23

      001576  027763                        EM23                        ;CLOCK B REPEATABILITY ERROR
      001600  030575                        DH23                        ;ERROR   ASR   2NDCNT  1STCNT
      001602  030666                        DT1                         ;$ERRPC, ASR, $BDDAT, $GDDAT
      001604  031070                        DFO                         ;ALL NUMBERS ARE IN OCTAL FORM
 (1)

                                    ;ITEM   24
      001606  027607                        EM15                           ;CLOCK B COUNT ERROR
      001610  030301                        DH7                            ;ERRPC   BCR   WAS   S/B
      001612  031036                        DT24                           ;$ERRPC, BCR, $GDDAT, $TMPO
      001614  031070                        DF0                            ;ALL NUMBERS ARE IN OCTAL FORM
 (1)

                                  ;ITEM     25

      001616  027607                        EM15                           ;CLOCK B COUNT ERROR
      001620  030301                        DH7                            ;ERRPC   BCR    WAS     S/B
      001622  031050                        DT25                           ;$ERRPC,BCR,$BDDAT,$TMPO
      001624  031070                        DF0                            ;ALL NUMBERS ARE IN OCTAL FORM
 (1)

                                  ;ITEM     26

      001626  030022                        EM26      ;CLOCK ADDRESSING ERRROR
      001630  030637                        DH26      ;ERRPC    CLOCK ADDR.
      001632  031062                        DT26      ;$ERRPC,$TMPO
      001634  031070                        DF0                            ;ALL NUMBERS ARE IN OCTAL FORM
 (1)
                                            ;
 (1)                                        ;ADDRESS OF KMC-11 OF LPA-11    THE ADDR FOR KMADO MAY BE
 (1)                                        ;                               CHANGED BY THE USER TO REFLECT
 (1)                                        ;                               A DIFFERENT KMC-11 ADDR. THE
 (1)                                        ;                               REST OF THE ADDRESSES WILL
 (1)                                        ;                               BE CHANGED BY THE PROGRAM.
 (1)                                        ;
 (1)                                        ;
 (1)
 (1)  001636                      LPCI:
 (1)  001636  170460              KMADO:   .WORD     170460            ;BASE KMC ADDR. MAY BE PATCHED BY USER.
 (1)
 (1)  001640                      LPMR:
 (1)  001640  170461              KMAD1:   .WORD     170460+1                ;>DO NOT        <;KMC-CSR ADDR
 (1)  001642                      LPCO:
 (1)  001642  170462              KMAD2:   .WORD     170460+2                ;>PATCH         <;
 (1)  001644                      LPSO:
 (1)  001644  170463              KMAD3:   .WORD     170460+3                ;>THIS AREA     <
 (1)  001646                      LPADL:
 (1)  001646  170464              KMAD4:   .WORD     170460+4                ;
 (1)  001650                      LPADH:
 (1)  001650  170465              KMAD5:   .WORD     170460+5                ;>DO NOT        <
 (1)  001652                      LPMS1:
 (1)  001652  170466              KMAD6:   .WORD     170460+6                ;>PATCH         <
 (1)  001654                      LPMS2:
 (1)  001654  170467              KMAD7:   .WORD     170460+7                ;>THIS AREA     <
 (1)
 (1)  001656  000344              VECTOR:  .WORD     AVECT1&777        ;BASE VECTOR OF KMC
 (1)  001660  000350              VECTPS:  .WORD     4+AVECT1&777      ;VECOTR ADDR.+2
 (1)
 (1)  001662  000005              VERSN:   .WORD     5                 ;CURRENT VERSION NUMBER OF MICROCODE.
 (1)
 (1)  001664  000000              .DVLS:   .WORD     0                 ;/DEVICE LIST OF I/O ADDR. DEFINED
 (1)  001666  000020                       .BLKW     16.               ;/BY INIT.
 (1)
```

```
  1440                                  .SBTTL  PROGRAM START
```

```
      001726                                   START:
 (1)                                           .SBTTL  INITIALIZE THE COMMON TAGS
 (1)                                           ;;CLEAR THE COMMON TAGS ($CMTAG) AREA
 (1)  001726  012706  001100                           MOV     #$CMTAG,R6          ;;FIRST LOCATION TO BE CLEARED
 (1)  001732  005026                                   CLR     (R6)+               ;;CLEAR MEMORY LOCATION
 (1)  001734  022706  001140                           CMP     #SWR,R6 ;;DONE?
 (1)  001740  001374                                   BNE     .-6                 ;;LOOP BACK IF NO
 (1)  001742  012706  001100                           MOV     #STACK,SP           ;;SETUP THE STACK POINTER
 (1)                                           ;;INITIALIZE A FEW VECTORS
 (1)  001746  012737  025062  000020                   MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
 (1)  001754  012737  000340  000022                   MOV     #340,@#IOTVEC+2 ;;LEVEL 7
 (1)  001762  012737  024302  000030                   MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
 (1)  001770  012737  000340  000032                   MOV     #340,@#EMTVEC+2 ;;LEVEL 7
 (1)  001776  012737  027102  000034                   MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
 (1)  002004  012737  000340  000036                   MOV     #340,@#TRAPVEC+2;LEVEL 7
 (1)  002012  012737  026662  000024                   MOV     #$PWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
 (1)  002020  012737  000340  000026                   MOV     #340,@#PWRVEC+2 ;;LEVEL 7
 (1)  002026  013737  022362  022354                   MOV     $ENDCT,$EOPCT    ;;SETUP END-OF-PROGRAM COUNTER
 (1)  002034  005037  001166                           CLR     $ESCAPE          ;;CLEAR THE ESCAPE ON ERROR ADDRESS
 (1)  002040  112737  000001  001115                   MOVB    #1,$ERMAX        ;;ALLOW ONE ERROR PER TEST
 (1)  002046  012737  002046  001106                   MOV     #.,$LPADR        ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
 (1)  002054  012737  002054  001110                   MOV     #.,$LPERR        ;;SETUP THE ERROR LOOP ADDRESS
 (2)                                           ;;SIZE FOR A HARDWARE SWITCH REGISTER. IF NOT FOUND OR IT IS
 (2)                                           ;;EQUAL TO A "-1", SETUP FOR A SOFTWARE SWITCH REGISTER.
 (2)  002062  013746  000004                           MOV     @#ERRVEC,-(SP)   ;;SAVE ERROR VECTOR
 (2)  002066  012737  002122  000004                   MOV     #64$,@#ERRVEC    ;;SET UP ERROR VECTOR
 (2)  002074  012737  177570  001140                   MOV     #DSWR,SWR        ;;SETUP FOR A HARDWARE SWICH REGISTER
 (2)  002102  012737  177570  001142                   MOV     #DDISP,DISPLAY   ;;AND A HARDWARE DISPLAY REGISTER
 (2)  002110  022777  177777  177022                   CMP     #-1,@SWR         ;;TRY TO REFERENCE HARDWARE SWR
 (2)  002116  001012                                   BNE     66$              ;;BRANCH IF NO TIMEOUT TRAP OCCURRED
 (2)                                                                            ;;AND  THE HARDWARE SWR IS NOT = -1
 (2)  002120  000403                                   BR      65$              ;;BRANCH IF NO TIMEOUT
 (2)  002122  012716  002130                   64$:    MOV     #65$,(SP)        ;;SET UP FOR TRAP RETURN
 (2)  002126  000002                                   RTI
 (2)  002130  012737  000176  001140           65$:    MOV     #SWREG,SWR       ;;POINT TO SOFTWARE SWR
 (2)  002136  012737  000174  001142                   MOV     #DISPREG,DISPLAY
 (2)  002144  012637  000004                   66$:    MOV     (SP)+,@#ERRVEC   ;;RESTORE ERROR VECTOR
 (1)
 (2)  002150  005037  001206                           CLR     $PASS            ;;CLEAR PASS COUNT
 (2)  002154  132737  000200  001221                   BITB    #APTSIZE,$ENVM   ;;TEST USER SIZE UNDER APT
 (2)  002162  001403                                   BEQ     67$              ;;YES,USE NON-APT SWITCH
 (2)  002164  012737  001222  001140                   MOV     #$SWREG,SWR      ;;NO,USE APT SWITCH REGISTER
 (2)  002172                                   67$:
      002172  122737  000001  001134                   CMPB    #1,$AUTOB        ;IF RUNNING XXDP ETC.
      002200  001426                                   BEQ     10$

      002202  104401  002210                           TYPE    ,69$             ;;TYPE ASCIZ STRING
 (1)  002206  000423                                   BR      68$              ;;GET OVER THE ASCIZ
 (1)                                           ;;69$:  .ASCIZ  <15><12><12>#CRLPGC   LPA/KW11-K  DIAGNOSTIC#<15><12>
 (1)  002256                                   68$:

      002256  013737  001254  001324           10$:    MOV     $BASE,ASR
      002264  012737  000001  001210                   MOV     #1,$DEVCT
      002272  005037  001206                           CLR     $PASS

```

```
                                                  ;
                                                  ;THIS SECTION OF CODE HANDLES INITIALIZING LPA-11 FUNCTIONS
                                                  ;
 002276  010046                                   MOV     R0,-(SP)
 002300  010146                                   MOV     R1,-(SP)
 002302  013700  001636                           MOV     KMAD0,R0          ;GET KMC-11 ADDRESS.
 002306  012701  001640                           MOV     #KMAD1,R1         ;GET ADDR. OF ADDR. LIST.

 002312  005200                         70$:      INC     R0                ;UPDATE ADDR.
 002314  010021                                   MOV     R0,(1)+           ;WRITE ADDR.
 002316  020127  001656                           CMP     R1,#KMAD7+2       ;DONE ALL ADDRESSES?
 002322  001373                                   BNE     70$               ;NO - DO NEXT ADDR.
 002324  005037  001664                           CLR     .DVLS             ;CLR ADDR. LIST.
 002330  012601                                   MOV     (SP)+,R1
 002332  012600                                   MOV     (SP)+,R0

 002334                                 LOOP:
 002334  005000                                   CLR     R0
 002336  005200                         1$:       INC     R0                ;DELAY SOME TIME SO THAT FIRST RESET
 002340  001376                                   BNE     1$                ;INSTR. WON'T CLOBBER TYPEOUT.
 002342  013700  001324                           MOV     ASR,R0            ;NOW WE'RE GONNA FIX
 002346  062700  000002                           ADD     #2,R0             ;ALL CLOCK ADDRESSES BASED ON ASR.
 002352  010037  001326                           MOV     R0,ABR
 002356  062700  000022                           ADD     #22,R0
 002362  010037  001330                           MOV     R0,ACR
 002366  062700  000002                           ADD     #2,R0
 002372  010037  001332                           MOV     R0,BSR
 002376  062700  000002                           ADD     #2,R0
 002402  010037  001334                           MOV     R0,BBR
 002406  062700  000002                           ADD     #2,R0
 002412  010037  001336                           MOV     R0,BCR

 002416  013700  001340                           MOV     AVECT,R0          ;NOW FIX VECTOR ADDRESSES
 002422  062700  000002                           ADD     #2,R0             ;BASED ON AVECT.
 002426  010037  001342                           MOV     R0,AVECP2
 002432  062700  000016                           ADD     #16,R0
 002436  010037  001344                           MOV     R0,BVECT
 002442  062700  000002                           ADD     #2,R0
 002446  010037  001346                           MOV     R0,BVECT2

 002452  013737  001350  001352                   MOV     APRITY,BPRITY     ;FIX CLK B'S PRIORITY BASED ON A'S.
 002460  000402                                   BR      SSTART
 002462  005037  001664                 RSTART:   CLR     .DVLS
 002466  012706  001100                 SSTART:   MOV     #STACK,SP
 002472  012746  000340                           MOV     #340,-(SP)        ;SET PROCESSOR PRIORITY TO 7.
 002476  012746  002504                           MOV     #1$,-(SP)
 002502  000002                                   RTI
 002504                                 1$:

                                        .SBTTL  *
                                        .SBTTL  * PHASE 1 CLOCKS A+B BASIC LOGIC TESTS.
                                        .SBTTL  *
 1518
  (1)
  (5)                                           ;;*******************************************************************
  (4)                                           ;*TEST 1          *TEST THE ADDRESSABILITY OF CLOCK ADDRESS
  (5)                                           ;*
  (5)                                           ;*"BUS A17":"A04"="DEVICE" H; "DEVICE" H +"TP0" H="DEV ENABLE" H
  (5)                                           ;*"DEV ENABLE"- H+"TP1" H="DEV ENB 2" H
  (5)                                           ;*
  (6)                                           ;*
  (6)                                           ;* PROBABLE SYNC POINT FOR THIS TEST:: "BUS A17"
  (6)                                           ;*
  (5)                                           ;* CLOCK ADDRESS  TEST. SCOPE FOR "DEV ENB Z" H AND WORK BACK
  (5)                                           ;*
  (4)                                           ;;*******************************************************************
  (3)  002504  000240                           TST1:   NOP
  (1)  002506  112737  000001  001102           1$:     MOVB    #1,$TSTNM
  (1)  002514  112737  000001  001204                   MOVB    #1,$TESTN
  (1)
  (1)
  (2)
  (2)                                           ;*      MOV     @ASR,$BDDAT     ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
  (2)
  (2)                                           ;*      MOV     @ABR,$BDDAT     ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
  (2)
  (2)                                           ;*      MOV     @ACR,$BDDAT     ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
  (2)
  (2)                                           ;*      MOV     @BSR,$BDDAT     ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
  (2)
  (2)                                           ;*      MOV     @BBR,$BDDAT     ;/READ DEVICE REG BBR,PUT DATA IN $BDDAT.
  (2)
  (2)                                           ;*      MOV     @BCR,$BDDAT     ;/READ DEVICE REG BCR,PUT DATA IN $BDDAT.
  (1)
 1541
 1542                                           ;;*******************************************************************
  (3)                                           ;*TEST 2          *TEST THAT CLOCK A BUFFER CAN BE WRITTEN INTO
  (4)                                           ;*
  (4)                                           ;*FOR LOADING DATA:
  (4)                                           ;*
  (4)                                           ;*(WE KNOW WE CAN ADDR. KW11), "BUS A01" L + "A02" H + "A03" H
  (4)                                           ;*+"BUS C1" L="LD BUFF A" L
  (4)                                           ;*"LD BUF A" L + BUFFERED DATA LOADS INTO MUX LATCH (NOTE WE KNOW
  (4)                                           ;*BY NOW "TP1" L SHOULD BE GOOD).
  (4)                                           ;*
  (4)                                           ;* FOR READING DATA:
  (4)                                           ;*
  (4)                                           ;*BUS A01 L + (DATA 1N H + EV ENABLE(1) H)=RD BUFF AL
  (4)                                           ;*[BA01H*(DEPENDING ON WHICH DATA BITS READ) RD BUF AL]+BUFF A00:15
  (4)                                           ;* +[DEV ENABLE*DATA IN L]=BUS DATA
  (4)                                           ;*
  (4)                                           ;*SINCE WE WONT LOOK FOR ANY SPECIFIC DATA BIT FAILURE,
  (4)                                           ;*JUST THAT WE CAN WRITE INTO BUFFER + READ BACK,
  (4)                                           ;*IF FAILED, KEY ON "LD BUFF A L" AND "RD BUFF A L"
  (5)                                           ;*
  (5)                                           ;* PROBABLE SYNC POINT FOR THIS TEST:: "BUS A17" (2 OCCURANCES PER LOOP)
  (5)                                           ;*
  (4)                                           ;*
```

```
                                  ;;******************************************************************
002602  000004                    TST2:   SCOPE

                                                                  ;WRITE INTO PRESET BUFFER.
                                                                  ;SET $GDDAT FOR ERROR TYPEOUT.
                                                                  ;READ THE PRESET BUFFER.
002604  012737  001416  001124            MOV     #1416,$GDDAT

                                  ;*      MOV     $GDDAT,@ABR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR

                                  ;*      MOV     @ABR,$BDDAT     ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
002632  005737  001126                    TST     $BDDAT
002636  001001                            BNE     1$              ;IF ANY DATA WAS READ BACK, WE WILL
                                                                  ;BR PAST THE ERROR CALL.


        ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

002640  104003                            ERROR   3               ;UNABLE TO LOAD AND READ BACK
                                                                  ;FROM THE BUFFER REGISTER CLOCK A.

        ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

002642                            1$:     .
```

```
                                ;;*********************************************************************
                                ;*TEST 3         *TEST THAT CLOCK A BUFFER CAN BE WRITTEN TO A ZERO
                                ;*
                                ;*THE LAST TEST WROTE 1'S INTO CLOCK A'S BUFFER. IN THIS
                                ;*TEST WE TRY TO WRITE ALL ZEROS.
                                ;*
                                ;*SIGNALS - SAME AS LAST TEST. SUSPECT F/F OR DATA GATE STUCK OPEN
                                ;*
                                ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD BUFF A"
                                ;*
                                ;*

                                ;;*********************************************************************
 002642  000004                 TST3:   SCOPE

 002644  005037  001124                 CLR     $GDDAT                  ;INDICATE WE EXPECT 0'S.
                                                                        ;CLEAR BUFFER REGISTER.
                                                                        ;READ CLOCK A'S BUFFER REGISTER

                                ;*      MOV     $GDDAT,@ABR             ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR

                                ;*      MOV     @ABR,$BDDAT             ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
 002670  005737  001126                 TST     $BDDAT
 002674  001401                         BEQ     1$                      ;SHOULD BE CLEAR - IF CLEAR - NEXT TEST.


         ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 002676  104003                         ERROR   3                       ;CLEAR INTR. FAILED TO CLEAR CLOCK A'S
                                                                        ;BUFFER REGISTER.

         ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 002700                         1$:



                                ;;*********************************************************************
                                ;*TEST 4          *TEST THAT CLOCK A'S STATUS CAN BE WRITTEN AND READ
                                ;*
                                ;*NOW THAT WE CAN WRITE INTO THE BUFFER REGISTER, WE'RE GOING TO TRY
                                ;*WRITING INTO THE STATUS REGISTER AND READ IT BACK.
                                ;*
                                ;*NEW SIGNALS: ["BA03" L + "BA02" L + "BA01" L]="LD STAT A" L
                                ;*      "DATA OUT LO" L + "DATA OUT HI" L + "LD STATA" L = "LD STAT A HI" H
                                ;*      + "LD STATA LO H"
                                ;*FOR READ BACK: "RD STATA" L
                                ;*
                                ;*NO ATTEMPT MADE TO VERIFY THAT CORRECT DATA CAME BACK, BUT
                                ;*JUST THAT SOME DATA CAME BACK.
                                ;*
                                ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEV ENABLE (1)" 2 OCCURANCES PER PASS
                                ;*
                                ;*

                                ;;*********************************************************************
 (2)  002700  000004                     TST4:   SCOPE

      002702  012737  001416  001124             MOV     #1416,$GDDAT      ;LOAD $GDDAT WITH S/B.
                                                                           ;LOAD STATUS REGISTER.
                                                                           ;READ BACK STATUS REGISTER

 (1)                                     ;*      MOV     $GDDAT,@ASR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR

 (1)                                     ;*      MOV     @ASR,$BDDAT       ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
      002730  005737  001126                     TST     $BDDAT
      002734  001001                             BNE     1$                ;IF ANY BITS RETURNED - NO ERROR.

              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

      002736  104002                             ERROR   2                 ;ERROR-UNABLE TO LOAD AND READ BACK
                                                                           ;STATUS REGISTER OF CLOCK A.


              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

      002740                             1$:                               ;CLEAR CLOCKA'S STATUS REG.
      002740  005037  001124                     CLR     $GDDAT

 (1)                                     ;*      MOV     $GDDAT,@ASR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR


                                         ;;*****************************************************************
 (3)                                     ;*TEST 5          *TEST THAT CLOCK B'S STATUS REGISTER CAN BE WROTE/READ
 (4)                                     ;*
 (4)                                     ;*NEW SIGNALS: ['BA03'' H + ''BA02'' L + ''BA01'' L]=''LD STATB'' L*''RD STAT B'' L
 (5)                                     ;*
 (5)                                     ;* PROBABLE SYNC POINT FOR THIS TEST:: ''DEV ENABLE (1)'' 2 OCCURANCES PER PASS
 (5)                                     ;*
 (4)                                     ;*
 (4)
 (3)                                     ;;*****************************************************************
 (2)  002754  000004                     TST5:   SCOPE

      002756  012737  001016  001124             MOV     #1016,$GDDAT      ;USE 1016 AS PATTERN, PUT IN $GDDAT.
                                                                           ;LOAD B'S STAT REG.
                                                                           ;READ BACK THE STATUS REG.

 (1)                                     ;*      MOV     $GDDAT,@BSR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR

 (1)                                     ;*      MOV     @BSR,$BDDAT       ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
      003004  005737  001126                     TST     $BDDAT
      003010  001001                             BNE     1$                ;IF ANY BITS CAME BACK, SUBTEST OK.


              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

      003012  104005                             ERROR   5                 ;ERROR-COULD NOT WRITE/READ BACK
                                                                           ;CLOCK B'S STATUS REGISTER.


              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$
```

```
003014                          1$:



                                ;;*******************************************************************
                                ;*TEST 6         *TEST THAT CLOCK B'S BUFFER REGISTER CAN BE WROTE/READ
                                ;*
                                ;*NEW SIGNALS: ["BA03" H + "BA02" L + "BA01" H]="LD BUFF B" L*"RD BUFF B" L
                                ;*
                                ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEV ENABLE (1)" 2 OCCURANCES PER PASS
                                ;*
                                ;*
                                ;;*******************************************************************
003014  000004                  TST6:   SCOPE

003016  012737  000370  001124          MOV     #370,$GDDAT             ;USE PATTERN "370", PUT IN $GDDAT.
                                                                        ;WRITE INTO CLOCK B'S BUFFER REGISTER.
                                                                        ;READ IT BACK.

                                ;*      MOV     $GDDAT,@BBR             ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR

                                ;*      MOV     @BBR,$BDDAT             ;/READ DEVICE REG BBR,PUT DATA IN $BDDAT.
003044  005737  001126                  TST     $BDDAT
003050  001001                          BNE     1$                      ;IF ANY BITS COME BACK-SUBTEST OK.


        ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

003052  104006                          ERROR   6                       ;ERROR-FAILED TO WRITE/READ CLOCKB'S
                                                                        ;BUFFER REGISTER.


        ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

003054                          1$:
 1778                                              ;/#
  (6)                                      ;;*****************************************************************
  (5)                                      ;*TEST 7          *TEST THAT CLOCK A STATUS REGISTER BIT 15 CAN BE SET AND CLEARED
  (6)                                      ;*
  (6)                                      ;*CLOCK A STATUS REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
  (6)                                      ;*F/FS OR GATES
  (7)                                      ;*
  (7)                                      ;* PROBABLE SYNC POINT FOR THIS TEST:: ''DEVICE OUT'' 2 OCCURANCES PER PASS
  (7)                                      ;*
  (6)                                      ;*
  (5)                                      ;;*****************************************************************
  (4)  003054  000004                      TST7:    SCOPE
  (2)                                                                       ;/CLEAR THE STATUS REGISTER.
  (2)                                                                       ;/SET BIT 15.
  (2)                                                                       ;/SET FOR ERROR TYPEOUT S/B.
  (2)                                                                        ;/READ THE STATUS REGISTER.
  (2)  003056  012737  100000  001124               MOV      #BIT15,$GDDAT
  (3)
  (3)                                      ;*       MOV      $GDDAT,@ASR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
  (3)
  (3)                                      ;*       MOV      @ASR,$BDDAT      ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
  (2)  003104  023737  001124  001126               CMP      $GDDAT,$BDDAT    ;/DID BIT 15 AND ONLY BIT 15 SET?
  (2)  003112  001402                               BEQ      1$               ;/IF SO-LETS TRY CLEARING IT.
  (3)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (2)  003114  104002                               ERROR    2                ;/ERROR CLOCK AS STATUS REGISTER.
  (2)                                                                       ;/BIT 15 FAILED TO BIT SET.
  (3)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (2)  003116  000416                               BR       2$               ;/BR TO END SUBTEST.
  (2)  003120                              1$:                                ;/TRY CLEARING BIT 15.
  (2)  003120  005037  001124                       CLR      $GDDAT            ;/CLEAR S/B FOR TYPEOUT IF ANY.
  (2)                                                                       ;/NOW READ IT BACK.
  (3)
  (3)                                      ;*       MOV      $GDDAT,@ASR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
  (3)
  (3)                                      ;*       MOV      @ASR,$BDDAT      ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
  (2)  003144  005737  001126                       TST      $BDDAT
  (2)  003150  001401                               BEQ      2$               ;/IF ZERO-NO ERROR!
  (3)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (2)  003152  104002                               ERROR    2                ;/ERROR-CLOCK A STATUS REGISTER.
  (2)                                                                       ;/BIT 15 FAILED TO CLEAR.
  (3)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (2)  003154                              2$:
```

```
(2)                                                     ;/#
(6)                                        ;;*******************************************************************
(5)                                        ;*TEST 10       *TEST THAT CLOCK A STATUS REGISTER BIT 14 CAN BE SET AND CLEARED
(6)                                        ;*
(6)                                        ;*CLOCK A STATUS REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
(6)                                        ;*F/FS OR GATES
(7)                                        ;*
(7)                                        ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
(7)                                        ;*
(6)                                        ;*
(5)                                        ;;*******************************************************************
(4)  003154  000004                        TST10:  SCOPE
(2)                                                                       ;/CLEAR THE STATUS REGISTER.
(2)                                                                       ;/SET BIT 14.
(2)                                                                       ;/SET FOR ERROR TYPEOUT S/B.
(2)                                                                        ;/READ THE STATUS REGISTER.
(2)  003156  012737  040000  001124                MOV     #BIT14,$GDDAT
(3)
(3)                                        ;*      MOV     $GDDAT,@ASR        ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
(3)
(3)                                        ;*      MOV     @ASR,$BDDAT        ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
(2)  003204  023737  001124  001126                CMP     $GDDAT,$BDDAT      ;/DID BIT 14 AND ONLY BIT 14 SET?
(2)  003212  001402                                BEQ     1$                 ;/IF SO-LETS TRY CLEARING IT.
(3)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

(2)  003214  104002                                ERROR   2                  ;/ERROR CLOCK AS STATUS REGISTER.
(2)                                                                       ;/BIT 14 FAILED TO BIT SET.
(3)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

(2)  003216  000416                                BR      2$                 ;/BR TO END SUBTEST.
(2)  003220                                1$:                                ;/TRY CLEARING BIT 14.
(2)  003220  005037  001124                        CLR     $GDDAT              ;/CLEAR S/B FOR TYPEOUT IF ANY.
(2)                                                                       ;/NOW READ IT BACK.
(3)
(3)                                        ;*      MOV     $GDDAT,@ASR        ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
(3)
(3)                                        ;*      MOV     @ASR,$BDDAT        ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
(2)  003244  005737  001126                        TST     $BDDAT
(2)  003250  001401                                BEQ     2$                 ;/IF ZERO-NO ERROR!
(3)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

(2)  003252  104002                                ERROR   2                  ;/ERROR-CLOCK A STATUS REGISTER.
(2)                                                                       ;/BIT 14 FAILED TO CLEAR.
(3)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

(2)  003254                                2$:
```

```
(2)                                           ;/#
(6)                                      ;;*******************************************************************
(5)                                      ;*TEST 11         *TEST THAT CLOCK A STATUS REGISTER BIT 13 CAN BE SET AND CLEARED
(6)                                      ;*
(6)                                      ;*CLOCK A STATUS REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
(6)                                      ;*F/FS OR GATES
(7)                                      ;*
(7)                                      ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
(7)                                      ;*
(6)                                      ;*
(5)                                      ;;*******************************************************************
(4)  003254  000004                      TST11:  SCOPE
(2)                                                                      ;/CLEAR THE STATUS REGISTER.
(2)                                                                      ;/SET BIT 13.
(2)                                                                      ;/SET FOR ERROR TYPEOUT S/B.
(2)                                                                       ;/READ THE STATUS REGISTER.
(2)  003256  012737  020000  001124              MOV     #BIT13,$GDDAT
(3)
(3)                                      ;*      MOV     $GDDAT,@ASR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
(3)
(3)                                      ;*      MOV     @ASR,$BDDAT      ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
(2)  003304  023737  001124  001126              CMP     $GDDAT,$BDDAT    ;/DID BIT 13 AND ONLY BIT 13 SET?
(2)  003312  001402                              BEQ     1$               ;/IF SO-LETS TRY CLEARING IT.
(3)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

(2)  003314  104002                              ERROR   2                ;/ERROR CLOCK AS STATUS REGISTER.
(2)                                                                       ;/BIT 13 FAILED TO BIT SET.
(3)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

(2)  003316  000416                              BR      2$               ;/BR TO END SUBTEST.
(2)  003320                              1$:                               ;/TRY CLEARING BIT 13.
(2)  003320  005037  001124                      CLR     $GDDAT            ;/CLEAR S/B FOR TYPEOUT IF ANY.
(2)                                                                       ;/NOW READ IT BACK.
(3)
(3)                                      ;*      MOV     $GDDAT,@ASR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
(3)
(3)                                      ;*      MOV     @ASR,$BDDAT      ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
(2)  003344  005737  001126                      TST     $BDDAT
(2)  003350  001401                              BEQ     2$               ;/IF ZERO-NO ERROR!
(3)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

(2)  003352  104002                              ERROR   2                ;/ERROR-CLOCK A STATUS REGISTER.
(2)                                                                       ;/BIT 13 FAILED TO CLEAR.
(3)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

(2)  003354                              2$:
 (2)                                                  ;/#
 (6)                                          ;;*******************************************************************
 (5)                                          ;*TEST 12        *TEST THAT CLOCK A STATUS REGISTER BIT 9 CAN BE SET AND CLEARED
 (6)                                          ;*
 (6)                                          ;*CLOCK A STATUS REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
 (6)                                          ;*F/FS OR GATES
 (7)                                          ;*
 (7)                                          ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
 (7)                                          ;*
 (6)                                          ;*
 (5)                                          ;;*******************************************************************
 (4)  003354  000004                          TST12:  SCOPE
 (2)                                                                          ;/CLEAR THE STATUS REGISTER.
 (2)                                                                          ;/SET BIT 9.
 (2)                                                                          ;/SET FOR ERROR TYPEOUT S/B.
 (2)                                                                           ;/READ THE STATUS REGISTER.
 (2)  003356  012737  001000  001124                  MOV     #BIT9,$GDDAT
 (3)
 (3)                                          ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
 (3)
 (3)                                          ;*      MOV     @ASR,$BDDAT     ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
 (2)  003404  023737  001124  001126                  CMP     $GDDAT,$BDDAT   ;/DID BIT 9 AND ONLY BIT 9 SET?
 (2)  003412  001402                                  BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
 (3)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (2)  003414  104002                                  ERROR   2               ;/ERROR CLOCK AS STATUS REGISTER.
 (2)                                                                          ;/BIT 9 FAILED TO BIT SET.
 (3)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (2)  003416  000416                                  BR      2$              ;/BR TO END SUBTEST.
 (2)  003420                                  1$:                             ;/TRY CLEARING BIT 9.
 (2)  003420  005037  001124                          CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
 (2)                                                                          ;/NOW READ IT BACK.
 (3)
 (3)                                          ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
 (3)
 (3)                                          ;*      MOV     @ASR,$BDDAT     ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
 (2)  003444  005737  001126                          TST     $BDDAT
 (2)  003450  001401                                  BEQ     2$              ;/IF ZERO-NO ERROR!
 (3)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (2)  003452  104002                                  ERROR   2               ;/ERROR-CLOCK A STATUS REGISTER.
 (2)                                                                          ;/BIT 9 FAILED TO CLEAR.
 (3)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (2)  003454                                  2$:
```

```
 (2)                                           ;/#
 (6)                                    ;;*************************************************************
 (5)                                    ;*TEST 13        *TEST THAT CLOCK A STATUS REGISTER BIT 8 CAN BE SET AND CLEARED
 (6)                                    ;*
 (6)                                    ;*CLOCK A STATUS REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
 (6)                                    ;*F/FS OR GATES
 (7)                                    ;*
 (7)                                    ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
 (7)                                    ;*
 (6)                                    ;*
 (5)                                    ;;*************************************************************
 (4)  003454  000004                    TST13:  SCOPE
 (2)                                                                    ;/CLEAR THE STATUS REGISTER.
 (2)                                                                    ;/SET BIT 8.
 (2)                                                                    ;/SET FOR ERROR TYPEOUT S/B.
 (2)                                                                     ;/READ THE STATUS REGISTER.
 (2)  003456  012737  000400  001124            MOV     #BIT8,$GDDAT
 (3)
 (3)                                    ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
 (3)
 (3)                                    ;*      MOV     @ASR,$BDDAT     ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
 (2)  003504  023737  001124  001126            CMP     $GDDAT,$BDDAT   ;/DID BIT 8 AND ONLY BIT 8 SET?
 (2)  003512  001402                            BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
 (3)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (2)  003514  104002                            ERROR   2               ;/ERROR CLOCK AS STATUS REGISTER.
 (2)                                                                    ;/BIT 8 FAILED TO BIT SET.
 (3)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (2)  003516  000416                            BR      2$              ;/BR TO END SUBTEST.
 (2)  003520                            1$:                             ;/TRY CLEARING BIT 8.
 (2)  003520  005037  001124                    CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
 (2)                                                                    ;/NOW READ IT BACK.
 (3)
 (3)                                    ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
 (3)
 (3)                                    ;*      MOV     @ASR,$BDDAT     ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
 (2)  003544  005737  001126                    TST     $BDDAT
 (2)  003550  001401                            BEQ     2$              ;/IF ZERO-NO ERROR!
 (3)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (2)  003552  104002                            ERROR   2               ;/ERROR-CLOCK A STATUS REGISTER.
 (2)                                                                    ;/BIT 8 FAILED TO CLEAR.
 (3)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (2)  003554                            2$:
```

```
(2)                                             ;/#
(6)                                     ;;*****************************************************************
(5)                                     ;*TEST 14        *TEST THAT CLOCK A STATUS REGISTER BIT 7 CAN BE SET AND CLEARED
(6)                                     ;*
(6)                                     ;*CLOCK A STATUS REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
(6)                                     ;*F/FS OR GATES
(7)                                     ;*
(7)                                     ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
(7)                                     ;*
(6)                                     ;*
(5)                                     ;;*****************************************************************
(4)  003554  000004                     TST14:  SCOPE
(2)                                                                     ;/CLEAR THE STATUS REGISTER.
(2)                                                                     ;/SET BIT 7.
(2)                                                                     ;/SET FOR ERROR TYPEOUT S/B.
(2)                                                                      ;/READ THE STATUS REGISTER.
(2)  003556  012737  000200  001124             MOV     #BIT7,$GDDAT
(3)
(3)                                     ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
(3)
(3)                                     ;*      MOV     @ASR,$BDDAT     ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
(2)  003604  023737  001124  001126             CMP     $GDDAT,$BDDAT   ;/DID BIT 7 AND ONLY BIT 7 SET?
(2)  003612  001402                             BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
(3)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

(2)  003614  104002                             ERROR   2               ;/ERROR CLOCK AS STATUS REGISTER.
(2)                                                                     ;/BIT 7 FAILED TO BIT SET.
(3)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

(2)  003616  000416                             BR      2$              ;/BR TO END SUBTEST.
(2)  003620                             1$:                             ;/TRY CLEARING BIT 7.
(2)  003620  005037  001124                     CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
(2)                                                                     ;/NOW READ IT BACK.
(3)
(3)                                     ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
(3)
(3)                                     ;*      MOV     @ASR,$BDDAT     ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
(2)  003644  005737  001126                     TST     $BDDAT
(2)  003650  001401                             BEQ     2$              ;/IF ZERO-NO ERROR!
(3)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

(2)  003652  104002                             ERROR   2               ;/ERROR-CLOCK A STATUS REGISTER.
(2)                                                                     ;/BIT 7 FAILED TO CLEAR.
(3)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

(2)  003654                             2$:
```

```
(2)                                                  ;/#
(6)                                       ;;*******************************************************************
(5)                                       ;*TEST 15        *TEST THAT CLOCK A STATUS REGISTER BIT 6 CAN BE SET AND CLEARED
(6)                                       ;*
(6)                                       ;*CLOCK A STATUS REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
(6)                                       ;*F/FS OR GATES
(7)                                       ;*
(7)                                       ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
(7)                                       ;*
(6)                                       ;*
(5)                                       ;;*******************************************************************
(4)  003654  000004                       TST15:  SCOPE
(2)                                                                      ;/CLEAR THE STATUS REGISTER.
(2)                                                                      ;/SET BIT 6.
(2)                                                                      ;/SET FOR ERROR TYPEOUT S/B.
(2)                                                                       ;/READ THE STATUS REGISTER.
(2)  003656  012737  000100  001124               MOV      #BIT6,$GDDAT
(3)
(3)                                       ;*      MOV      $GDDAT,@ASR   ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
(3)
(3)                                       ;*      MOV      @ASR,$BDDAT   ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
(2)  003704  023737  001124  001126               CMP      $GDDAT,$BDDAT ;/DID BIT 6 AND ONLY BIT 6 SET?
(2)  003712  001402                               BEQ      1$            ;/IF SO-LETS TRY CLEARING IT.
(3)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(2)  003714  104002                               ERROR    2             ;/ERROR CLOCK AS STATUS REGISTER.
(2)                                                                      ;/BIT 6 FAILED TO BIT SET.
(3)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(2)  003716  000416                               BR       2$            ;/BR TO END SUBTEST.
(2)  003720                               1$:                            ;/TRY CLEARING BIT 6.
(2)  003720  005037  001124                       CLR      $GDDAT         ;/CLEAR S/B FOR TYPEOUT IF ANY.
(2)                                                                      ;/NOW READ IT BACK.
(3)
(3)                                       ;*      MOV      $GDDAT,@ASR   ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
(3)
(3)                                       ;*      MOV      @ASR,$BDDAT   ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
(2)  003744  005737  001126                       TST      $BDDAT
(2)  003750  001401                               BEQ      2$            ;/IF ZERO-NO ERROR!
(3)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(2)  003752  104002                               ERROR    2             ;/ERROR-CLOCK A STATUS REGISTER.
(2)                                                                      ;/BIT 6 FAILED TO CLEAR.
(3)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(2)  003754                               2$:
```

```
(2)                                          ;/#
(6)                                         ;;*****************************************************************
(5)                                         ;*TEST 16        *TEST THAT CLOCK A STATUS REGISTER BIT 5 CAN BE SET AND CLEARED
(6)                                         ;*
(6)                                         ;*CLOCK A STATUS REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
(6)                                         ;*F/FS OR GATES
(7)                                         ;*
(7)                                         ;* PROBABLE SYNC POINT FOR THIS TEST:: ''DEVICE OUT'' 2 OCCURANCES PER PASS
(7)                                         ;*
(6)                                         ;*
(5)                                         ;;*****************************************************************
(4)   003754  000004                        TST16:  SCOPE
(2)                                                                         ;/CLEAR THE STATUS REGISTER.
(2)                                                                         ;/SET BIT 5.
(2)                                                                         ;/SET FOR ERROR TYPEOUT S/B.
(2)                                                                          ;/READ THE STATUS REGISTER.
(2)   003756  012737  000040  001124                MOV     #BIT5,$GDDAT
(3)
(3)                                         ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
(3)
(3)                                         ;*      MOV     @ASR,$BDDAT     ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
(2)   004004  023737  001124  001126                CMP     $GDDAT,$BDDAT   ;/DID BIT 5 AND ONLY BIT 5 SET?
(2)   004012  001402                                BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
(3)
                  ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(2)   004014  104002                                ERROR   2               ;/ERROR CLOCK AS STATUS REGISTER.
(2)                                                                         ;/BIT 5 FAILED TO BIT SET.
(3)
                  ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(2)   004016  000416                                BR      2$              ;/BR TO END SUBTEST.
(2)   004020                                1$:                             ;/TRY CLEARING BIT 5.
(2)   004020  005037  001124                        CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
(2)                                                                         ;/NOW READ IT BACK.
(3)
(3)                                         ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
(3)
(3)                                         ;*      MOV     @ASR,$BDDAT     ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
(2)   004044  005737  001126                        TST     $BDDAT
(2)   004050  001401                                BEQ     2$              ;/IF ZERO-NO ERROR!
(3)
                  ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(2)   004052  104002                                ERROR   2               ;/ERROR-CLOCK A STATUS REGISTER.
(2)                                                                         ;/BIT 5 FAILED TO CLEAR.
(3)
                  ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(2)   004054                                2$:
 (2)                                          ;/#
 (6)                                  ;;*****************************************************************
 (5)                                  ;*TEST 17        *TEST THAT CLOCK A STATUS REGISTER BIT 3 CAN BE SET AND CLEARED
 (6)                                  ;*
 (6)                                  ;*CLOCK A STATUS REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
 (6)                                  ;*F/FS OR GATES
 (7)                                  ;*
 (7)                                  ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
 (7)                                  ;*
 (6)                                  ;*
 (5)                                  ;;*****************************************************************
 (4)  004054  000004                  TST17:  SCOPE
 (2)                                                                  ;/CLEAR THE STATUS REGISTER.
 (2)                                                                  ;/SET BIT 3.
 (2)                                                                  ;/SET FOR ERROR TYPEOUT S/B.
 (2)                                                                   ;/READ THE STATUS REGISTER.
 (2)  004056  012737  000010  001124          MOV     #BIT3,$GDDAT
 (3)
 (3)                                  ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
 (3)
 (3)                                  ;*      MOV     @ASR,$BDDAT     ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
 (2)  004104  023737  001124  001126          CMP     $GDDAT,$BDDAT   ;/DID BIT 3 AND ONLY BIT 3 SET?
 (2)  004112  001402                          BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
 (3)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (2)  004114  104002                          ERROR   2               ;/ERROR CLOCK AS STATUS REGISTER.
 (2)                                                                  ;/BIT 3 FAILED TO BIT SET.
 (3)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (2)  004116  000416                          BR      2$              ;/BR TO END SUBTEST.
 (2)  004120                          1$:                             ;/TRY CLEARING BIT 3.
 (2)  004120  005037  001124                  CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
 (2)                                                                  ;/NOW READ IT BACK.
 (3)
 (3)                                  ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
 (3)
 (3)                                  ;*      MOV     @ASR,$BDDAT     ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
 (2)  004144  005737  001126                  TST     $BDDAT
 (2)  004150  001401                          BEQ     2$              ;/IF ZERO-NO ERROR!
 (3)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (2)  004152  104002                          ERROR   2               ;/ERROR-CLOCK A STATUS REGISTER.
 (2)                                                                  ;/BIT 3 FAILED TO CLEAR.
 (3)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (2)  004154                          2$:
```

```
 (2)                                          ;/#
 (6)                                      ;;*****************************************************************
 (5)                                      ;*TEST 20        *TEST THAT CLOCK A STATUS REGISTER BIT 2 CAN BE SET AND CLEARED
 (6)                                      ;*
 (6)                                      ;*CLOCK A STATUS REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
 (6)                                      ;*F/FS OR GATES
 (7)                                      ;*
 (7)                                      ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
 (7)                                      ;*
 (6)                                      ;*
 (5)                                      ;;*****************************************************************
 (4)  004154  000004                      TST20:  SCOPE
 (2)                                                                          ;/CLEAR THE STATUS REGISTER.
 (2)                                                                          ;/SET BIT 2.
 (2)                                                                          ;/SET FOR ERROR TYPEOUT S/B.
 (2)                                                                           ;/READ THE STATUS REGISTER.
 (2)  004156  012737  000004  001124              MOV     #BIT2,$GDDAT
 (3)
 (3)                                      ;*      MOV     $GDDAT,@ASR         ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
 (3)
 (3)                                      ;*      MOV     @ASR,$BDDAT         ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
 (2)  004204  023737  001124  001126              CMP     $GDDAT,$BDDAT       ;/DID BIT 2 AND ONLY BIT 2 SET?
 (2)  004212  001402                              BEQ     1$                  ;/IF SO-LETS TRY CLEARING IT.
 (3)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

 (2)  004214  104002                              ERROR   2                   ;/ERROR CLOCK AS STATUS REGISTER.
 (2)                                                                          ;/BIT 2 FAILED TO BIT SET.
 (3)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

 (2)  004216  000416                              BR      2$                  ;/BR TO END SUBTEST.
 (2)  004220                              1$:                                 ;/TRY CLEARING BIT 2.
 (2)  004220  005037  001124                      CLR     $GDDAT               ;/CLEAR S/B FOR TYPEOUT IF ANY.
 (2)                                                                          ;/NOW READ IT BACK.
 (3)
 (3)                                      ;*      MOV     $GDDAT,@ASR         ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
 (3)
 (3)                                      ;*      MOV     @ASR,$BDDAT         ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
 (2)  004244  005737  001126                      TST     $BDDAT
 (2)  004250  001401                              BEQ     2$                  ;/IF ZERO-NO ERROR!
 (3)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

 (2)  004252  104002                              ERROR   2                   ;/ERROR-CLOCK A STATUS REGISTER.
 (2)                                                                          ;/BIT 2 FAILED TO CLEAR.
 (3)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

 (2)  004254                              2$:
```

```
(2)                                             ;/#
(6)                                      ;;*******************************************************************
(5)                                      ;*TEST 21       *TEST THAT CLOCK A STATUS REGISTER BIT 1 CAN BE SET AND CLEARED
(6)                                      ;*
(6)                                      ;*CLOCK A STATUS REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
(6)                                      ;*F/FS OR GATES
(7)                                      ;*
(7)                                      ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
(7)                                      ;*
(6)                                      ;*
(5)                                      ;;*******************************************************************
(4)  004254  000004                      TST21:  SCOPE
(2)                                                                       ;/CLEAR THE STATUS REGISTER.
(2)                                                                       ;/SET BIT 1.
(2)                                                                       ;/SET FOR ERROR TYPEOUT S/B.
(2)                                                                        ;/READ THE STATUS REGISTER.
(2)  004256  012737  000002  001124              MOV     #BIT1,$GDDAT
(3)
(3)                                      ;*      MOV     $GDDAT,@ASR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
(3)
(3)                                      ;*      MOV     @ASR,$BDDAT      ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
(2)  004304  023737  001124  001126              CMP     $GDDAT,$BDDAT    ;/DID BIT 1 AND ONLY BIT 1 SET?
(2)  004312  001402                              BEQ     1$               ;/IF SO-LETS TRY CLEARING IT.
(3)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(2)  004314  104002                              ERROR   2                ;/ERROR CLOCK AS STATUS REGISTER.
(2)                                                                       ;/BIT 1 FAILED TO BIT SET.
(3)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(2)  004316  000416                              BR      2$               ;/BR TO END SUBTEST.
(2)  004320                              1$:                              ;/TRY CLEARING BIT 1.
(2)  004320  005037  001124                      CLR     $GDDAT            ;/CLEAR S/B FOR TYPEOUT IF ANY.
(2)                                                                       ;/NOW READ IT BACK.
(3)
(3)                                      ;*      MOV     $GDDAT,@ASR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
(3)
(3)                                      ;*      MOV     @ASR,$BDDAT      ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
(2)  004344  005737  001126                      TST     $BDDAT
(2)  004350  001401                              BEQ     2$               ;/IF ZERO-NO ERROR!
(3)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(2)  004352  104002                              ERROR   2                ;/ERROR-CLOCK A STATUS REGISTER.
(2)                                                                       ;/BIT 1 FAILED TO CLEAR.
(3)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(2)  004354                              2$:
    (2)                                         ;/#
    (6)                                  ;;*******************************************************************
    (5)                                  ;*TEST 22        *TEST THAT CLOCK A STATUS REGISTER BIT 0 CAN BE SET AND CLEARED
    (6)                                  ;*
    (6)                                  ;*CLOCK A STATUS REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
    (6)                                  ;*F/FS OR GATES
    (7)                                  ;*
    (7)                                  ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
    (7)                                  ;*
    (6)                                  ;*
    (5)                                  ;;*******************************************************************
    (4)  004354  000004                  TST22:  SCOPE
    (2)                                                                 ;/CLEAR THE STATUS REGISTER.
    (2)                                                                 ;/SET BIT 0.
    (2)                                                                 ;/SET FOR ERROR TYPEOUT S/B.
    (2)                                                                  ;/READ THE STATUS REGISTER.
    (2)  004356  012737  000001  001124          MOV     #BIT0,$GDDAT
    (3)
    (3)                                  ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
    (3)
    (3)                                  ;*      MOV     @ASR,$BDDAT     ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
    (2)  004404  023737  001124  001126          CMP     $GDDAT,$BDDAT   ;/DID BIT 0 AND ONLY BIT 0 SET?
    (2)  004412  001402                          BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
    (3)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

    (2)  004414  104002                          ERROR   2               ;/ERROR CLOCK AS STATUS REGISTER.
    (2)                                                                  ;/BIT 0 FAILED TO BIT SET.
    (3)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

    (2)  004416  000416                          BR      2$              ;/BR TO END SUBTEST.
    (2)  004420                          1$:                             ;/TRY CLEARING BIT 0.
    (2)  004420  005037  001124                  CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
    (2)                                                                  ;/NOW READ IT BACK.
    (3)
    (3)                                  ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
    (3)
    (3)                                  ;*      MOV     @ASR,$BDDAT     ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
    (2)  004444  005737  001126                  TST     $BDDAT
    (2)  004450  001401                          BEQ     2$              ;/IF ZERO-NO ERROR!
    (3)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

    (2)  004452  104002                          ERROR   2               ;/ERROR-CLOCK A STATUS REGISTER.
    (2)                                                                  ;/BIT 0 FAILED TO CLEAR.
    (3)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

    (2)  004454                          2$:
```

```
 (3)                                                    ;/#
 (7)                                    ;;*************************************************************
 (6)                                    ;*TEST 23         *TEST THAT CLOCK A BUFFER REGISTER BIT 0 CAN BE SET AND CLEARED
 (7)                                    ;*
 (7)                                    ;*CLOCK A BUFFER REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
 (7)                                    ;*F/FS OR GATES
 (8)                                    ;*
 (8)                                    ;* PROBABLE SYNC POINT FOR THIS TEST:: ''DEVICE OUT'' 2 OCCURANCES PER PASS
 (8)                                    ;*
 (7)                                    ;*
 (6)                                    ;;*************************************************************
 (5)  004454  000004                    TST23:  SCOPE
 (3)                                                                       ;/CLEAR THE BUFFER REGISTER.
 (3)                                                                       ;/SET BIT 0.
 (3)                                                                       ;/SET FOR ERROR TYPEOUT S/B.
 (3)                                                                        ;/READ THE BUFFER REGISTER.
 (3)  004456  012737  000001  001124            MOV     #BIT0,$GDDAT
 (4)
 (4)                                    ;*      MOV     $GDDAT,@ABR        ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
 (4)
 (4)                                    ;*      MOV     @ABR,$BDDAT        ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
 (3)  004504  023737  001124  001126            CMP     $GDDAT,$BDDAT      ;/DID BIT 0 AND ONLY BIT 0 SET?
 (3)  004512  001402                            BEQ     1$                 ;/IF SO-LETS TRY CLEARING IT.
 (4)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  004514  104003                            ERROR   3                  ;/ERROR CLOCK AS BUFFER REGISTER.
 (3)                                                                       ;/BIT 0 FAILED TO BIT SET.
 (4)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  004516  000416                            BR      2$                 ;/BR TO END SUBTEST.
 (3)  004520                            1$:                                ;/TRY CLEARING BIT 0.
 (3)  004520  005037  001124                    CLR     $GDDAT              ;/CLEAR S/B FOR TYPEOUT IF ANY.
 (3)                                                                       ;/NOW READ IT BACK.
 (4)
 (4)                                    ;*      MOV     $GDDAT,@ABR        ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
 (4)
 (4)                                    ;*      MOV     @ABR,$BDDAT        ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
 (3)  004544  005737  001126                    TST     $BDDAT
 (3)  004550  001401                            BEQ     2$                 ;/IF ZERO-NO ERROR!
 (4)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  004552  104003                            ERROR   3                  ;/ERROR-CLOCK A BUFFER REGISTER.
 (3)                                                                       ;/BIT 0 FAILED TO CLEAR.
 (4)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  004554                            2$:
  (3)                                           ;/#
  (7)                                   ;;*************************************************************
  (6)                                   ;*TEST 24        *TEST THAT CLOCK A BUFFER REGISTER BIT 1 CAN BE SET AND CLEARED
  (7)                                   ;*
  (7)                                   ;*CLOCK A BUFFER REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
  (7)                                   ;*F/FS OR GATES
  (8)                                   ;*
  (8)                                   ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
  (8)                                   ;*
  (7)                                   ;*
  (6)                                   ;;*************************************************************
  (5)  004554  000004                   TST24:  SCOPE
  (3)                                                                   ;/CLEAR THE BUFFER REGISTER.
  (3)                                                                   ;/SET BIT 1.
  (3)                                                                   ;/SET FOR ERROR TYPEOUT S/B.
  (3)                                                                    ;/READ THE BUFFER REGISTER.
  (3)
  (3)  004556  012737  000002  001124           MOV     #BIT1,$GDDAT
  (4)
  (4)                                   ;*      MOV     $GDDAT,@ABR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
  (4)
  (4)                                   ;*      MOV     @ABR,$BDDAT     ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
  (3)  004604  023737  001124  001126           CMP     $GDDAT,$BDDAT   ;/DID BIT 1 AND ONLY BIT 1 SET?
  (3)  004612  001402                           BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
  (4)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  004614  104003                           ERROR   3               ;/ERROR CLOCK AS BUFFER REGISTER.
  (3)                                                                   ;/BIT 1 FAILED TO BIT SET.
  (4)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  004616  000416                           BR      2$              ;/BR TO END SUBTEST.
  (3)  004620                           1$:                             ;/TRY CLEARING BIT 1.
  (3)  004620  005037  001124                   CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
  (3)                                                                   ;/NOW READ IT BACK.
  (4)
  (4)                                   ;*      MOV     $GDDAT,@ABR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
  (4)
  (4)                                   ;*      MOV     @ABR,$BDDAT     ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
  (3)  004644  005737  001126                   TST     $BDDAT
  (3)  004650  001401                           BEQ     2$              ;/IF ZERO-NO ERROR!
  (4)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  004652  104003                           ERROR   3               ;/ERROR-CLOCK A BUFFER REGISTER.
  (3)                                                                   ;/BIT 1 FAILED TO CLEAR.
  (4)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  004654                           2$:
```

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(3)                                          ;/#
(7)                                          ;;*******************************************************************
(6)                                          ;*TEST 25          *TEST THAT CLOCK A BUFFER REGISTER BIT 2 CAN BE SET AND CLEARED
(7)                                          ;*
(7)                                          ;*CLOCK A BUFFER REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
(7)                                          ;*F/FS OR GATES
(8)                                          ;*
(8)                                          ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
(8)                                          ;*
(7)                                          ;*
(6)                                          ;;*******************************************************************
(5)  004654  000004                          TST25:  SCOPE
(3)                                                                          ;/CLEAR THE BUFFER REGISTER.
(3)                                                                          ;/SET BIT 2.
(3)                                                                          ;/SET FOR ERROR TYPEOUT S/B.
(3)                                                                           ;/READ THE BUFFER REGISTER.
(3)  004656  012737  000004  001124                  MOV     #BIT2,$GDDAT
(4)
(4)                                          ;*      MOV     $GDDAT,@ABR         ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
(4)
(4)                                          ;*      MOV     @ABR,$BDDAT         ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
(3)  004704  023737  001124  001126                  CMP     $GDDAT,$BDDAT       ;/DID BIT 2 AND ONLY BIT 2 SET?
(3)  004712  001402                                  BEQ     1$                  ;/IF SO-LETS TRY CLEARING IT.
(4)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  004714  104003                                  ERROR   3                   ;/ERROR CLOCK AS BUFFER REGISTER.
(3)                                                                          ;/BIT 2 FAILED TO BIT SET.
(4)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  004716  000416                                  BR      2$                  ;/BR TO END SUBTEST.
(3)  004720                                  1$:                                 ;/TRY CLEARING BIT 2.
(3)  004720  005037  001124                          CLR     $GDDAT               ;/CLEAR S/B FOR TYPEOUT IF ANY.
(3)                                                                          ;/NOW READ IT BACK.
(4)
(4)                                          ;*      MOV     $GDDAT,@ABR         ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
(4)
(4)                                          ;*      MOV     @ABR,$BDDAT         ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
(3)  004744  005737  001126                          TST     $BDDAT
(3)  004750  001401                                  BEQ     2$                  ;/IF ZERO-NO ERROR!
(4)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  004752  104003                                  ERROR   3                   ;/ERROR-CLOCK A BUFFER REGISTER.
(3)                                                                          ;/BIT 2 FAILED TO CLEAR.
(4)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  004754                                  2$:
 (3)                                          ;/#
 (7)                                          ;;*****************************************************************
 (6)                                          ;*TEST 26         *TEST THAT CLOCK A BUFFER REGISTER BIT 3 CAN BE SET AND CLEARED
 (7)                                          ;*
 (7)                                          ;*CLOCK A BUFFER REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
 (7)                                          ;*F/FS OR GATES
 (8)                                          ;*
 (8)                                          ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
 (8)                                          ;*
 (7)                                          ;*
 (6)                                          ;;*****************************************************************
 (5)  004754  000004                          TST26:  SCOPE
 (3)                                                                          ;/CLEAR THE BUFFER REGISTER.
 (3)                                                                          ;/SET BIT 3.
 (3)                                                                          ;/SET FOR ERROR TYPEOUT S/B.
 (3)                                                                           ;/READ THE BUFFER REGISTER.
 (3)  004756  012737  000010  001124                  MOV     #BIT3,$GDDAT
 (4)
 (4)                                          ;*      MOV     $GDDAT,@ABR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
 (4)
 (4)                                          ;*      MOV     @ABR,$BDDAT     ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
 (3)  005004  023737  001124  001126                  CMP     $GDDAT,$BDDAT   ;/DID BIT 3 AND ONLY BIT 3 SET?
 (3)  005012  001402                                  BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
 (4)
                  ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  005014  104003                                  ERROR   3               ;/ERROR CLOCK AS BUFFER REGISTER.
 (3)                                                                          ;/BIT 3 FAILED TO BIT SET.
 (4)
                  ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  005016  000416                                  BR      2$              ;/BR TO END SUBTEST.
 (3)  005020                                  1$:                             ;/TRY CLEARING BIT 3.
 (3)  005020  005037  001124                          CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
 (3)                                                                          ;/NOW READ IT BACK.
 (4)
 (4)                                          ;*      MOV     $GDDAT,@ABR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
 (4)
 (4)                                          ;*      MOV     @ABR,$BDDAT     ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
 (3)  005044  005737  001126                          TST     $BDDAT
 (3)  005050  001401                                  BEQ     2$              ;/IF ZERO-NO ERROR!
 (4)
                  ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  005052  104003                                  ERROR   3               ;/ERROR-CLOCK A BUFFER REGISTER.
 (3)                                                                          ;/BIT 3 FAILED TO CLEAR.
 (4)
                  ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  005054                                  2$:
```

```
(3)                                          ;/#
(7)                                      ;;*************************************************************
(6)                                      ;*TEST 27        *TEST THAT CLOCK A BUFFER REGISTER BIT 4 CAN BE SET AND CLEARED
(7)                                      ;*
(7)                                      ;*CLOCK A BUFFER REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
(7)                                      ;*F/FS OR GATES
(8)                                      ;*
(8)                                      ;* PROBABLE SYNC POINT FOR THIS TEST:: ''DEVICE OUT'' 2 OCCURANCES PER PASS
(8)                                      ;*
(7)                                      ;*
(6)                                      ;;*************************************************************
(5)  005054  000004                      TST27:  SCOPE
(3)                                                                         ;/CLEAR THE BUFFER REGISTER.
(3)                                                                         ;/SET BIT 4.
(3)                                                                         ;/SET FOR ERROR TYPEOUT S/B.
(3)                                                                          ;/READ THE BUFFER REGISTER.
(3)  005056  012737  000020  001124              MOV     #BIT4,$GDDAT
(4)
(4)                                      ;*      MOV     $GDDAT,@ABR         ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
(4)
(4)                                      ;*      MOV     @ABR,$BDDAT         ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
(3)  005104  023737  001124  001126              CMP     $GDDAT,$BDDAT       ;/DID BIT 4 AND ONLY BIT 4 SET?
(3)  005112  001402                              BEQ     1$                  ;/IF SO-LETS TRY CLEARING IT.
(4)
                    ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  005114  104003                              ERROR   3                   ;/ERROR CLOCK AS BUFFER REGISTER.
(3)                                                                         ;/BIT 4 FAILED TO BIT SET.
(4)
                    ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  005116  000416                              BR      2$                  ;/BR TO END SUBTEST.
(5)  005120                              1$:                                ;/TRY CLEARING BIT 4.
(3)  005120  005037  001124                      CLR     $GDDAT               ;/CLEAR S/B FOR TYPEOUT IF ANY.
(3)                                                                         ;/NOW READ IT BACK.
(4)
(4)                                      ;*      MOV     $GDDAT,@ABR         ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
(4)
(4)                                      ;*      MOV     @ABR,$BDDAT         ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
(3)  005144  005737  001126                      TST     $BDDAT
(3)  005150  001401                              BEQ     2$                  ;/IF ZERO-NO ERROR!
(4)
                    ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  005152  104003                              ERROR   3                   ;/ERROR-CLOCK A BUFFER REGISTER.
(3)                                                                         ;/BIT 4 FAILED TO CLEAR.
(4)
                    ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  005154                              2$:
   (3)                                                  ;/#
   (7)                                          ;;*******************************************************************
   (6)                                          ;*TEST 30        *TEST THAT CLOCK A BUFFER REGISTER BIT 5 CAN BE SET AND CLEARED
   (7)                                          ;*
   (7)                                          ;*CLOCK A BUFFER REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
   (7)                                          ;*F/FS OR GATES
   (8)                                          ;*
   (8)                                          ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
   (8)                                          ;*
   (7)                                          ;*
   (6)                                          ;;*******************************************************************
   (5)  005154  000004                          TST30:  SCOPE
   (3)                                                                          ;/CLEAR THE BUFFER REGISTER.
   (3)                                                                          ;/SET BIT 5.
   (3)                                                                          ;/SET FOR ERROR TYPEOUT S/B.
   (3)                                                                           ;/READ THE BUFFER REGISTER.
   (3)  005156  012737  000040  001124                  MOV     #BIT5,$GDDAT
   (4)
   (4)                                          ;*      MOV     $GDDAT,@ABR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
   (4)
   (4)                                          ;*      MOV     @ABR,$BDDAT     ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
   (3)  005204  023737  001124  001126                  CMP     $GDDAT,$BDDAT   ;/DID BIT 5 AND ONLY BIT 5 SET?
   (3)  005212  001402                                  BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
   (4)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

   (3)  005214  104003                                  ERROR   3               ;/ERROR CLOCK AS BUFFER REGISTER.
   (3)                                                                          ;/BIT 5 FAILED TO BIT SET.
   (4)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

   (3)  005216  000416                                  BR      2$              ;/BR TO END SUBTEST.
   (3)  005220                                  1$:                             ;/TRY CLEARING BIT 5.
   (3)  005220  005037  001124                          CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
   (3)                                                                          ;/NOW READ IT BACK.
   (4)
   (4)                                          ;*      MOV     $GDDAT,@ABR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
   (4)
   (4)                                          ;*      MOV     @ABR,$BDDAT     ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
   (3)  005244  005737  001126                          TST     $BDDAT
   (3)  005250  001401                                  BEQ     2$              ;/IF ZERO-NO ERROR!
   (4)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

   (3)  005252  104003                                  ERROR   3               ;/ERROR-CLOCK A BUFFER REGISTER.
   (3)                                                                          ;/BIT 5 FAILED TO CLEAR.
   (4)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

   (3)  005254                                  2$:
```

```
 (3)                                                  ;/#
 (7)                                        ;;****************************************************************
 (6)                                        ;*TEST 31          *TEST THAT CLOCK A BUFFER REGISTER BIT 6 CAN BE SET AND CLEARED
 (7)                                        ;*
 (7)                                        ;*CLOCK A BUFFER REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
 (7)                                        ;*F/FS OR GATES
 (8)                                        ;*
 (8)                                        ;* PROBABLE SYNC POINT FOR THIS TEST:: ''DEVICE OUT'' 2 OCCURANCES PER PASS
 (8)                                        ;*
 (7)                                        ;*
 (6)                                        ;;****************************************************************
 (5)  005254  000004                        TST31:  SCOPE
 (3)                                                                          ;/CLEAR THE BUFFER REGISTER.
 (3)                                                                          ;/SET BIT 6.
 (3)                                                                          ;/SET FOR ERROR TYPEOUT S/B.
 (3)                                                                           ;/READ .HE BUFFER REGISTER.
 (3)  005256  012737  000100  001124                MOV     #BIT6,$GDDAT
 (4)
 (4)                                        ;*      MOV     $GDDAT,@ABR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
 (4)
 (4)                                        ;*      MOV     @ABR,$BDDAT       ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
 (3)  005304  023737  001124  001126                CMP     $GDDAT,$BDDAT     ;/DID BIT 6 AND ONLY BIT 6 SET?
 (3)  005312  001402                                BEQ     1$                ;/IF SO-LETS TRY CLEARING IT.
 (4)
                  ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  005314  104003                                ERROR   3                 ;/ERROR CLOCK AS BUFFER REGISTER.
 (3)                                                                          ;/BIT 6 FAILED TO BIT SET.
 (4)
                  ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  005316  000416                                BR      2$                ;/BR TO END SUBTEST.
 (3)  005320                                1$:                               ;/TRY CLEARING BIT 6.
 (3)  005320  005037  001124                        CLR     $GDDAT             ;/CLEAR S/B FOR TYPEOUT IF ANY.
 (3)                                                                          ;/NOW READ IT BACK.
 (4)
 (4)                                        ;*      MOV     $GDDAT,@ABR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
 (4)
 (4)                                        ;*      MOV     @ABR,$BDDAT       ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
 (3)  005344  005737  001126                        TST     $BDDAT
 (3)  005350  001401                                BEQ     2$                ;/IF ZERO-NO ERROR!
 (4)
                  ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  005352  104003                                ERROR   3                 ;/ERROR-CLOCK A BUFFER REGISTER.
 (3)                                                                          ;/BIT 6 FAILED TO CLEAR.
 (4)
                  ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  005354                                2$:
```

```
 (3)                                             ;/#
 (7)                                    ;;*******************************************************************
 (6)                                    ;*TEST 32        *TEST THAT CLOCK A BUFFER REGISTER BIT 7 CAN BE SET AND CLEARED
 (7)                                    ;*
 (7)                                    ;*CLOCK A BUFFER REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
 (7)                                    ;*F/FS OR GATES
 (8)                                    ;*
 (8)                                    ;* PROBABLE SYNC POINT FOR THIS TEST:: ''DEVICE OUT'' 2 OCCURANCES PER PASS
 (8)                                    ;*
 (7)                                    ;*
 (6)                                    ;;*******************************************************************
 (5)  005354  000004                    TST32:  SCOPE
 (3)                                                                    ;/CLEAR THE BUFFER REGISTER.
 (3)                                                                    ;/SET BIT 7.
 (3)                                                                    ;/SET FOR ERROR TYPEOUT S/B.
 (3)                                                                     ;/READ THE BUFFER REGISTER.
 (3)  005356  012737  000200  001124            MOV     #BIT7,$GDDAT
 (4)
 (4)                                    ;*      MOV     $GDDAT,@ABR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
 (4)
 (4)                                    ;*      MOV     @ABR,$BDDAT     ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
 (3)  005404  023737  001124  001126            CMP     $GDDAT,$BDDAT   ;/DID BIT 7 AND ONLY BIT 7 SET?
 (3)  005412  001402                            BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
 (4)
          ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  005414  104003                            ERROR   3               ;/ERROR CLOCK AS BUFFER REGISTER.
 (3)                                                                    ;/BIT 7 FAILED TO BIT SET.
 (4)
          ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  005416  000416                            BR      2$              ;/BR TO END SUBTEST.
 (3)  005420                            1$:                             ;/TRY CLEARING BIT 7.
 (3)  005420  005037  001124                    CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
 (3)                                                                    ;/NOW READ IT BACK.
 (4)
 (4)                                    ;*      MOV     $GDDAT,@ABR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
 (4)
 (4)                                    ;*      MOV     @ABR,$BDDAT     ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
 (3)  005444  005737  001126                    TST     $BDDAT
 (3)  005450  001401                            BEQ     2$              ;/IF ZERO-NO ERROR!
 (4)
          ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  005452  104003                            ERROR   3               ;/ERROR-CLOCK A BUFFER REGISTER.
 (3)                                                                    ;/BIT 7 FAILED TO CLEAR.
 (4)
          ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  005454                            2$:
   (3)                                                 ;/#
   (7)                                          ;;******************************************************************
   (6)                                          ;*TEST 33         *TEST THAT CLOCK A BUFFER REGISTER BIT 8 CAN BE SET AND CLEARED
   (7)                                          ;*
   (7)                                          ;*CLOCK A BUFFER REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
   (7)                                          ;*F/FS OR GATES
   (8)                                          ;*
   (8)                                          ;* PROBABLE SYNC POINT FOR THIS TEST:: ''DEVICE OUT'' 2 OCCURANCES PER PASS
   (8)                                          ;*
   (7)                                          ;*
   (6)                                          ;;******************************************************************
   (5)  005454  000004                          TST33:  SCOPE
   (3)                                                                         ;/CLEAR THE BUFFER REGISTER.
   (3)                                                                         ;/SET BIT 8.
   (3)                                                                         ;/SET FOR ERROR TYPEOUT S/B.
   (3)                                                                          ;/READ THE BUFFER REGISTER.
   (3)  005456  012737  000400  001124                  MOV     #BIT8,$GDDAT
   (4)
   (4)                                          ;*      MOV     $GDDAT,@ABR    ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
   (4)
   (4)                                          ;*      MOV     @ABR,$BDDAT    ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
   (3)  005504  023737  001124  001126                  CMP     $GDDAT,$BDDAT  ;/DID BIT 8 AND ONLY BIT 8 SET?
   (3)  005512  001402                                  BEQ     1$             ;/IF SO-LETS TRY CLEARING IT.
   (4)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

   (3)  005514  104003                                  ERROR   3              ;/ERROR CLOCK AS BUFFER REGISTER.
   (3)                                                                         ;/BIT 8 FAILED TO BIT SET.
   (4)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

   (3)  005516  000416                                  BR      2$             ;/BR TO END SUBTEST.
   (3)  005520                                  1$:                            ;/TRY CLEARING BIT 8.
   (3)  005520  005037  001124                          CLR     $GDDAT          ;/CLEAR S/B FOR TYPEOUT IF ANY.
   (3)                                                                         ;/NOW READ IT BACK.
   (4)
   (4)                                          ;*      MOV     $GDDAT,@ABR    ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
   (4)
   (4)                                          ;*      MOV     @ABR,$BDDAT    ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
   (3)  005544  005737  001126                          TST     $BDDAT
   (3)  005550  001401                                  BEQ     2$             ;/IF ZERO-NO ERROR!
   (4)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

   (3)  005552  104003                                  ERROR   3              ;/ERROR-CLOCK A BUFFER REGISTER.
   (3)                                                                         ;/BIT 8 FAILED TO CLEAR.
   (4)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

   (3)  005554                                  2$:
```

```
 (3)                                               ;/#
 (7)                                        ;;*****************************************************************
 (6)                                        ;*TEST 34        *TEST THAT CLOCK A BUFFER REGISTER BIT 9 CAN BE SET AND CLEARED
 (7)                                        ;*
 (7)                                        ;*CLOCK A BUFFER REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
 (7)                                        ;*F/FS OR GATES
 (8)                                        ;*
 (8)                                        ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
 (8)                                        ;*
 (7)                                        ;*
 (6)                                        ;;*****************************************************************
 (5)  005554  000004                        TST34:  SCOPE
 (3)                                                                      ;/CLEAR THE BUFFER REGISTER.
 (3)                                                                      ;/SET BIT 9.
 (3)                                                                      ;/SET FOR ERROR TYPEOUT S/B.
 (3)                                                                       ;/READ THE BUFFER REGISTER.
 (3)  005556  012737  001000  001124                MOV     #BIT9,$GDDAT
 (4)
 (4)                                        ;*      MOV     $GDDAT,@ABR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
 (4)
 (4)                                        ;*      MOV     @ABR,$BDDAT       ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
 (3)  005604  023737  001124  001126                CMP     $GDDAT,$BDDAT     ;/DID BIT 9 AND ONLY BIT 9 SET?
 (3)  005612  001402                                BEQ     1$                ;/IF SO-LETS TRY CLEARING IT.
 (4)
          ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  005614  104003                                ERROR   3                 ;/ERROR CLOCK AS BUFFER REGISTER.
 (3)                                                                      ;/BIT 9 FAILED TO BIT SET.
 (4)
          ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  005616  000416                                BR      2$                ;/BR TO END SUBTEST.
 (3)  005620                                1$:                               ;/TRY CLEARING BIT 9.
 (3)  005620  005037  001124                        CLR     $GDDAT             ;/CLEAR S/B FOR TYPEOUT IF ANY.
 (3)                                                                      ;/NOW READ IT BACK.
 (4)
 (4)                                        ;*      MOV     $GDDAT,@ABR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
 (4)
 (4)                                        ;*      MOV     @ABR,$BDDAT       ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
 (3)  005644  005737  001126                        TST     $BDDAT
 (3)  005650  001401                                BEQ     2$                ;/IF ZERO-NO ERROR!
 (4)
          ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  005652  104003                                ERROR   3                 ;/ERROR-CLOCK A BUFFER REGISTER.
 (3)                                                                      ;/BIT 9 FAILED TO CLEAR.
 (4)
          ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  005654                                2$:
  (3)                                              ;/#
  (7)                                           ;;*************************************************************
  (6)                                           ;*TEST 35        *TEST THAT CLOCK A BUFFER REGISTER BIT 10 CAN BE SET AND CLEARED
  (7)                                           ;*
  (7)                                           ;*CLOCK A BUFFER REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
  (7)                                           ;*F/FS OR GATES
  (8)                                           ;*
  (8)                                           ;* PROBABLE SYNC POINT FOR THIS TEST:: ''DEVICE OUT'' 2 OCCURANCES PER PASS
  (8)                                           ;*
  (7)                                           ;*
  (6)                                           ;;*************************************************************
  (5)  005654  000004                           TST35:  SCOPE
  (3)                                                                         ;/CLEAR THE BUFFER REGISTER.
  (3)                                                                         ;/SET BIT 10.
  (3)                                                                         ;/SET FOR ERROR TYPEOUT S/B.
  (3)                                                                          ;/READ THE BUFFER REGISTER.
  (3)  005656  012737  002000  001124                   MOV     #BIT10,$GDDAT
  (4)
  (4)                                           ;*      MOV     $GDDAT,@ABR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
  (4)
  (4)                                           ;*      MOV     @ABR,$BDDAT      ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
  (3)  005704  023737  001124  001126                   CMP     $GDDAT,$BDDAT    ;/DID BIT 10 AND ONLY BIT 10 SET?
  (3)  005712  001402                                   BEQ     1$               ;/IF SO-LETS TRY CLEARING IT.
  (4)
            ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  005714  104003                                   ERROR   3                ;/ERROR CLOCK AS BUFFER REGISTER.
  (3)                                                                         ;/BIT 10 FAILED TO BIT SET.
  (4)
            ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  005716  000416                                   BR      2$               ;/BR TO END SUBTEST.
  (3)  005720                                   1$:                              ;/TRY CLEARING BIT 10.
  (3)  005720  005037  001124                           CLR     $GDDAT            ;/CLEAR S/B FOR TYPEOUT IF ANY.
  (3)                                                                         ;/NOW READ IT BACK.
  (4)
  (4)                                           ;*      MOV     $GDDAT,@ABR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
  (4)
  (4)                                           ;*      MOV     @ABR,$BDDAT      ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
  (3)  005744  005737  001126                           TST     $BDDAT
  (3)  005750  001401                                   BEQ     2$               ;/IF ZERO-NO ERROR!
  (4)
            ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  005752  104003                                   ERROR   3                ;/ERROR-CLOCK A BUFFER REGISTER.
  (3)                                                                         ;/BIT 10 FAILED TO CLEAR.
  (4)
            ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  005754                                   2$:
```

```
 (3)                                            ;/#
 (7)                                          ;;*****************************************************************
 (6)                                          ;*TEST 36       *TEST THAT CLOCK A BUFFER REGISTER BIT 11 CAN BE SET AND CLEARED
 (7)                                          ;*
 (7)                                          ;*CLOCK A BUFFER REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
 (7)                                          ;*F/FS OR GATES
 (8)                                          ;*
 (8)                                          ;* PROBABLE SYNC POINT FOR THIS TEST:: ''DEVICE OUT'' 2 OCCURANCES PER PASS
 (8)                                          ;*
 (7)                                          ;*
 (6)                                          ;;*****************************************************************
 (5)  005754  000004                          TST36:  SCOPE
 (3)                                                                                  ;/CLEAR THE BUFFER REGISTER.
 (3)                                                                                  ;/SET BIT 11.
 (3)                                                                                  ;/SET FOR ERROR TYPEOUT S/B.
 (3)                                                                                   ;/READ THE BUFFER REGISTER.
 (3)  005756  012737  004000  001124                  MOV     #BIT11,$GDDAT
 (4)
 (4)                                          ;*      MOV     $GDDAT,@ABR         ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
 (4)
 (4)                                          ;*      MOV     @ABR,$BDDAT         ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
 (3)  006004  023737  001124  001126                  CMP     $GDDAT,$BDDAT       ;/DID BIT 11 AND ONLY BIT 11 SET?
 (3)  006012  001402                                  BEQ     1$                  ;/IF SO-LETS TRY CLEARING IT.
 (4)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  006014  104003                                  ERROR   3                   ;/ERROR CLOCK AS BUFFER REGISTER.
 (3)                                                                              ;/BIT 11 FAILED TO BIT SET.
 (4)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  006016  000416                                  BR      2$                  ;/BR TO END SUBTEST.
 (3)  006020                                  1$:                                 ;/TRY CLEARING BIT 11.
 (3)  006020  005037  001124                          CLR     $GDDAT               ;/CLEAR S/B FOR TYPEOUT IF ANY.
 (3)                                                                              ;/NOW READ IT BACK.
 (4)
 (4)                                          ;*      MOV     $GDDAT,@ABR         ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
 (4)
 (4)                                          ;*      MOV     @ABR,$BDDAT         ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
 (3)  006044  005737  001126                          TST     $BDDAT
 (3)  006050  001401                                  BEQ     2$                  ;/IF ZERO-NO ERROR!
 (4)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  006052  104003                                  ERROR   3                   ;/ERROR-CLOCK A BUFFER REGISTER.
 (3)                                                                              ;/BIT 11 FAILED TO CLEAR.
 (4)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  006054                                  2$:
```

```
 (3)                                          ;/#
 (7)                                    ;;*************************************************************
 (6)                                    ;*TEST 37       *TEST THAT CLOCK A BUFFER REGISTER BIT 12 CAN BE SET AND CLEARED
 (7)                                    ;*
 (7)                                    ;*CLOCK A BUFFER REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
 (7)                                    ;*F/FS OR GATES
 (8)                                    ;*
 (8)                                    ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
 (8)                                    ;*
 (7)                                    ;*
 (6)                                    ;;*************************************************************
 (5)  006054  000004                    TST37:  SCOPE
 (3)                                                                    ;/CLEAR THE BUFFER REGISTER.
 (3)                                                                    ;/SET BIT 12.
 (3)                                                                    ;/SET FOR ERROR TYPEOUT S/B.
 (3)                                                                     ;/READ THE BUFFER REGISTER.
 (3)  006056  012737  010000  001124            MOV     #BIT12,$GDDAT
 (4)
 (4)                                    ;*      MOV     $GDDAT,@ABR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
 (4)
 (4)                                    ;*      MOV     @ABR,$BDDAT     ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
 (3)  006104  023737  001124  001126            CMP     $GDDAT,$BDDAT   ;/DID BIT 12 AND ONLY BIT 12 SET?
 (3)  006112  001402                            BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
 (4)
         ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  006114  104003                            ERROR   3               ;/ERROR CLOCK AS BUFFER REGISTER.
 (3)                                                                    ;/BIT 12 FAILED TO BIT SET.
 (4)
         ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  006116  000416                            BR      2$              ;/BR TO END SUBTEST.
 (3)  006120                            1$:                             ;/TRY CLEARING BIT 12.
 (3)  006120  005037  001124                    CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
 (3)                                                                    ;/NOW READ IT BACK.
 (4)
 (4)                                    ;*      MOV     $GDDAT,@ABR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
 (4)
 (4)                                    ;*      MOV     @ABR,$BDDAT     ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
 (3)  006144  005737  001126                    TST     $BDDAT
 (3)  006150  001401                            BEQ     2$              ;/IF ZERO-NO ERROR!
 (4)
         ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  006152  104003                            ERROR   3               ;/ERROR-CLOCK A BUFFER REGISTER.
 (3)                                                                    ;/BIT 12 FAILED TO CLEAR.
 (4)
         ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  006154                            2$:
```

```
 (3)                                    ;/#
 (7)                                    ;;*****************************************************************
 (6)                                    ;*TEST 40       *TEST THAT CLOCK A BUFFER REGISTER BIT 13 CAN BE SET AND CLEARED
 (7)                                    ;*
 (7)                                    ;*CLOCK A BUFFER REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
 (7)                                    ;*F/FS OR GATES
 (8)                                    ;*
 (8)                                    ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
 (8)                                    ;*
 (7)                                    ;*
 (6)                                    ;;*****************************************************************
 (5)  006154  000004                    TST40:  SCOPE
 (3)                                                                    ;/CLEAR THE BUFFER REGISTER.
 (3)                                                                    ;/SET BIT 13.
 (3)                                                                    ;/SET FOR ERROR TYPEOUT S/B.
 (3)                                                                     ;/READ THE BUFFER REGISTER.
 (3)  006156  012737  020000  001124            MOV     #BIT13,$GDDAT
 (4)
 (4)                                    ;*      MOV     $GDDAT,@ABR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
 (4)
 (4)                                    ;*      MOV     @ABR,$BDDAT     ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
 (3)  006204  023737  001124  001126            CMP     $GDDAT,$BDDAT   ;/DID BIT 13 AND ONLY BIT 13 SET?
 (3)  006212  001402                            BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
 (4)
            ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  006214  104003                            ERROR   3               ;/ERROR CLOCK AS BUFFER REGISTER.
 (3)                                                                    ;/BIT 13 FAILED TO BIT SET.
 (4)
            ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  006216  000416                            BR      2$              ;/BR TO END SUBTEST.
 (3)  006220                            1$:                             ;/TRY CLEARING BIT 13.
 (3)  006220  005037  001124                    CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
 (3)                                                                    ;/NOW READ IT BACK.
 (4)
 (4)                                    ;*      MOV     $GDDAT,@ABR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
 (4)
 (4)                                    ;*      MOV     @ABR,$BDDAT     ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
 (3)  006244  005737  001126                    TST     $BDDAT
 (3)  006250  001401                            BEQ     2$              ;/IF ZERO-NO ERROR!
 (4)
            ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  006252  104003                            ERROR   3               ;/ERROR-CLOCK A BUFFER REGISTER.
 (3)                                                                    ;/BIT 13 FAILED TO CLEAR.
 (4)
            ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  006254                            2$:
```

```
 (3)                                            ;/#
 (7)                                         ;;*****************************************************************
 (6)                                         ;*TEST 41        *TEST THAT CLOCK A BUFFER REGISTER BIT 14 CAN BE SET AND CLEARED
 (7)                                         ;*
 (7)                                         ;*CLOCK A BUFFER REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
 (7)                                         ;*F/FS OR GATES
 (8)                                         ;*
 (8)                                         ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
 (8)                                         ;*
 (7)                                         ;*
 (6)                                         ;;*****************************************************************
 (5)  006254  000004                         TST41:  SCOPE
 (3)                                                                         ;/CLEAR THE BUFFER REGISTER.
 (3)                                                                         ;/SET BIT 14.
 (3)                                                                         ;/SET FOR ERROR TYPEOUT S/B.
 (3)                                                                          ;/READ THE BUFFER REGISTER.
 (3)  006256  012737  040000  001124                 MOV     #BIT14,$GDDAT
 (4)
 (4)                                         ;*      MOV     $GDDAT,@ABR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
 (4)
 (4)                                         ;*      MOV     @ABR,$BDDAT     ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
 (3)  006304  023737  001124  001126                 CMP     $GDDAT,$BDDAT   ;/DID BIT 14 AND ONLY BIT 14 SET?
 (3)  006312  001402                                 BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
 (4)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  006314  104003                                 ERROR   3               ;/ERROR CLOCK AS BUFFER REGISTER.
 (3)                                                                         ;/BIT 14 FAILED TO BIT SET.
 (4)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  006316  000416                                 BR      2$              ;/BR TO END SUBTEST.
 (3)  006320                                 1$:                             ;/TRY CLEARING BIT 14.
 (3)  006320  005037  001124                         CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
 (3)                                                                         ;/NOW READ IT BACK.
 (4)
 (4)                                         ;*      MOV     $GDDAT,@ABR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
 (4)
 (4)                                         ;*      MOV     @ABR,$BDDAT     ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
 (3)  006344  005737  001126                         TST     $BDDAT
 (3)  006350  001401                                 BEQ     2$              ;/IF ZERO-NO ERROR!
 (4)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  006352  104003                                 ERROR   3               ;/ERROR-CLOCK A BUFFER REGISTER.
 (3)                                                                         ;/BIT 14 FAILED TO CLEAR.
 (4)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  006354                                 2$:
```

```
 (3)                                       ;/#
 (7)                                       ;;*************************************************************
 (6)                                       ;*TEST 42        *TEST THAT CLOCK A BUFFER REGISTER BIT 15 CAN BE SET AND CLEARED
 (7)                                       ;*
 (7)                                       ;*CLOCK A BUFFER REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
 (7)                                       ;*F/FS OR GATES
 (8)                                       ;*
 (8)                                       ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
 (8)                                       ;*
 (7)                                       ;*
 (6)                                       ;;*************************************************************
 (5) 006354  000004                        TST42:  SCOPE
 (3)                                                                       ;/CLEAR THE BUFFER REGISTER.
 (3)                                                                       ;/SET BIT 15.
 (3)                                                                       ;/SET FOR ERROR TYPEOUT S/B.
 (3)                                                                        ;/READ THE BUFFER REGISTER.
 (3) 006356  012737  100000  001124                MOV     #BIT15,$GDDAT
 (4)
 (4)                                       ;*      MOV     $GDDAT,@ABR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
 (4)
 (4)                                       ;*      MOV     @ABR,$BDDAT     ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
 (3) 006404  023737  001124  001126                CMP     $GDDAT,$BDDAT   ;/DID BIT 15 AND ONLY BIT 15 SET?
 (3) 006412  001402                                BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
 (4)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3) 006414  104003                                ERROR   3               ;/ERROR CLOCK AS BUFFER REGISTER.
 (3)                                                                       ;/BIT 15 FAILED TO BIT SET.
 (4)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3) 006416  000416                                BR      2$              ;/BR TO END SUBTEST.
 (5) 006420                                1$:                             ;/TRY CLEARING BIT 15.
 (3) 006420  005037  001124                        CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
 (3)                                                                       ;/NOW READ IT BACK.
 (4)
 (4)                                       ;*      MOV     $GDDAT,@ABR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
 (4)
 (4)                                       ;*      MOV     @ABR,$BDDAT     ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
 (3) 006444  005737  001126                        TST     $BDDAT
 (3) 006450  001401                                BEQ     2$              ;/IF ZERO-NO ERROR!
 (4)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3) 006452  104003                                ERROR   3               ;/ERROR-CLOCK A BUFFER REGISTER.
 (3)                                                                       ;/BIT 15 FAILED TO CLEAR.
 (4)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3) 006454                                2$:
 (1)
 (2)
 (3)                                          ;/#
 (7)                                  ;;*******************************************************************
 (6)                                  ;*TEST 43       *TEST THAT CLOCK B STATUS REGISTER BIT 11 CAN BE SET AND CLEARED
 (7)                                  ;*
 (7)                                  ;*CLOCK B STATUS REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
 (7)                                  ;*F/FS OR GATES
 (8)                                  ;*
 (8)                                  ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
 (8)                                  ;*
 (7)                                  ;*
 (6)                                  ;;*******************************************************************
 (5)  006454  000004                  TST43:  SCOPE
 (3)                                                                  ;/CLEAR THE STATUS REGISTER.
 (3)                                                                  ;/SET BIT 11.
 (3)                                                                  ;/SET FOR ERROR TYPEOUT S/B.
 (3)                                                                   ;/READ THE STATUS REGISTER.
 (3)  006456  012737  004000  001124          MOV     #BIT11,$GDDAT
 (4)
 (4)                                  ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
 (4)
 (4)                                  ;*      MOV     @BSR,$BDDAT     ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
 (3)  006504  023737  001124  001126          CMP     $GDDAT,$BDDAT   ;/DID BIT 11 AND ONLY BIT 11 SET?
 (3)  006512  001402                          BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
 (4)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  006514  104005                          ERROR   5               ;/ERROR CLOCK BS STATUS REGISTER.
 (3)                                                                  ;/BIT 11 FAILED TO BIT SET.
 (4)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  006516  000416                          BR      2$              ;/BR TO END SUBTEST.
 (3)  006520                          1$:                             ;/TRY CLEARING BIT 11.
 (3)  006520  005037  001124                  CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
 (3)                                                                  ;/NOW READ IT BACK.
 (4)
 (4)                                  ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
 (4)
 (4)                                  ;*      MOV     @BSR,$BDDAT     ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
 (3)  006544  005737  001126                  TST     $BDDAT
 (3)  006550  001401                          BEQ     2$              ;/IF ZERO-NO ERROR!
 (4)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  006552  104005                          ERROR   5               ;/ERROR-CLOCK B STATUS REGISTER.
 (3)                                                                  ;/BIT 11 FAILED TO CLEAR.
 (4)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  006554                          2$:
 (2)
```

```
(3)                                                  ;/#
(7)                                          ;;*******************************************************************
(6)                                          ;*TEST 44        *TEST THAT CLOCK B STATUS REGISTER BIT 7 CAN BE SET AND CLEARED
(7)                                          ;*
(7)                                          ;*CLOCK B STATUS REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
(7)                                          ;*F/FS OR GATES
(8)                                          ;*
(8)                                          ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
(8)                                          ;*
(7)                                          ;*
(6)                                          ;;*******************************************************************
(5)  006554  000004                          TST44:  SCOPE
(3)                                                                          ;/CLEAR THE STATUS REGISTER.
(3)                                                                          ;/SET BIT 7.
(3)                                                                          ;/SET FOR ERROR TYPEOUT S/B.
(3)                                                                           ;/READ THE STATUS REGISTER.
(3)  006556  012737  000200  001124                  MOV     #BIT7,$GDDAT
(4)
(4)                                          ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
(4)
(4)                                          ;*      MOV     @BSR,$BDDAT     ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
(3)  006604  023737  001124  001126                  CMP     $GDDAT,$BDDAT   ;/DID BIT 7 AND ONLY BIT 7 SET?
(3)  006612  001402                                  BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
(4)
                    ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  006614  104005                                  ERROR   5               ;/ERROR CLOCK BS STATUS REGISTER.
(3)                                                                          ;/BIT 7 FAILED TO BIT SET.
(4)
                    ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  006616  000416                                  BR      2$              ;/BR TO END SUBTEST.
(5)  006620                                  1$:                             ;/TRY CLEARING BIT 7.
(3)  006620  005037  001124                          CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
(3)                                                                          ;/NOW READ IT BACK.
(4)
(4)                                          ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
(4)
(4)                                          ;*      MOV     @BSR,$BDDAT     ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
(3)  006644  005737  001126                          TST     $BDDAT
(3)  006650  001401                                  BEQ     2$              ;/IF ZERO-NO ERROR!
(4)
                    ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  006652  104005                                  ERROR   5               ;/ERROR-CLOCK B STATUS REGISTER.
(3)                                                                          ;/BIT 7 FAILED TO CLEAR.
(4)
                    ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  006654                                  2$:
(2)
```

```
  (3)                                          ;/#
  (7)                                   ;;*****************************************************************
  (6)                                   ;*TEST 45       *TEST THAT CLOCK B STATUS REGISTER BIT 6 CAN BE SET AND CLEARED
  (7)                                   ;*
  (7)                                   ;*CLOCK B STATUS REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
  (7)                                   ;*F/FS OR GATES
  (8)                                   ;*
  (8)                                   ;* PROBABLE SYNC POINT FOR THIS TEST:: ''DEVICE OUT'' ? OCCURANCES PER PASS
  (8)                                   ;*
  (7)                                   ;*
  (6)                                   ;;*****************************************************************
  (5)  006654  000004                   TST45:  SCOPE
  (3)                                                                   ;/CLEAR THE STATUS REGISTER.
  (3)                                                                   ;/SET BIT 6.
  (3)                                                                   ;/SET FOR ERROR TYPEOUT S/B.
  (3)                                                                    ;/READ THE STATUS REGISTER.
  (3)  006656  012737  000100  001124           MOV     #BIT6,$GDDAT
  (4)
  (4)                                   ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
  (4)
  (4)                                   ;*      MOV     @BSR,$BDDAT     ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
  (3)  006704  023737  001124  001126           CMP     $GDDAT,$BDDAT   ;/DID BIT 6 AND ONLY BIT 6 SET?
  (3)  006712  001402                           BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
  (4)
           ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  006714  104005                           ERROR   5               ;/ERROR CLOCK BS STATUS REGISTER.
  (3)                                                                   ;/BIT 6 FAILED TO BIT SET.
  (4)
           ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  006716  000416                           BR      2$              ;/BR TO END SUBTEST.
  (3)  006720                           1$:                             ;/TRY CLEARING BIT 6.
  (3)  006720  005037  001124                   CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
  (3)                                                                   ;/NOW READ IT BACK.
  (4)
  (4)                                   ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
  (4)
  (4)                                   ;*      MOV     @BSR,$BDDAT     ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
  (3)  006744  005737  001126                   TST     $BDDAT
  (3)  006750  001401                           BEQ     2$              ;/IF ZERO-NO ERROR!
  (4)
           ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  006752  104005                           ERROR   5               ;/ERROR-CLOCK B STATUS REGISTER.
  (3)                                                                   ;/BIT 6 FAILED TO CLEAR.
  (4)
           ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  006754                           2$:
  (2)
```

```
(3)                                              ;/#
(7)                                     ;;*****************************************************************
(6)                                     ;*TEST 46       *TEST THAT CLOCK B STATUS REGISTER BIT 5 CAN BE SET AND CLEARED
(7)                                     ;*
(7)                                     ;*CLOCK B STATUS REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
(7)                                     ;*F/FS OR GATES
(8)                                     ;*
(8)                                     ;* PROBABLE SYNC POINT FOR THIS TEST:: ''DEVICE OUT'' 2 OCCURANCES PER PASS
(8)                                     ;*
(7)                                     ;*
(6)                                     ;;*****************************************************************
(5)  006754  000004                      TST46:  SCOPE
(3)                                                                     ;/CLEAR THE STATUS REGISTER.
(3)                                                                     ;/SET BIT 5.
(3)                                                                     ;/SET FOR ERROR TYPEOUT S/B.
(3)                                                                      ;/READ THE STATUS REGISTER.
(3)  006756  012737  000040  001124             MOV     #BIT5,$GDDAT
(4)
(4)                                     ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
(4)
(4)                                     ;*      MOV     @BSR,$BDDAT     ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
(3)  007004  023737  001124  001126             CMP     $GDDAT,$BDDAT   ;/DID BIT 5 AND ONLY BIT 5 SET?
(3)  007012  001402                             BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
(4)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  007014  104005                             ERROR   5               ;/ERROR CLOCK BS STATUS REGISTER.
(3)                                                                     ;/BIT 5 FAILED TO BIT SET.
(4)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  007016  000416                             BR      2$              ;/BR TO END SUBTEST.
(3)  007020                             1$:                             ;/TRY CLEARING BIT 5.
(3)  007020  005037  001124                     CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
(3)                                                                     ;/NOW READ IT BACK.
(4)
(4)                                     ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
(4)
(4)                                     ;*      MOV     @BSR,$BDDAT     ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
(3)  007044  005737  001126                     TST     $BDDAT
(3)  007050  001401                             BEQ     2$              ;/IF ZERO-NO ERROR!
(4)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  007052  104005                             ERROR   5               ;/ERROR-CLOCK B STATUS REGISTER.
(3)                                                                     ;/BIT 5 FAILED TO CLEAR.
(4)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  007054                             2$:
(2)
```

```
  (3)                                              ;/#
  (7)                                      ;;*****************************************************************
  (6)                                      ;*TEST 47        *TEST THAT CLOCK B STATUS REGISTER BIT 4 CAN BE SET AND CLEARED
  (7)                                      ;*
  (7)                                      ;*CLOCK B STATUS REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
  (7)                                      ;*F/FS OR GATES
  (8)                                      ;*
  (8)                                      ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
  (8)                                      ;*
  (7)                                      ;*
  (6)                                      ;;*****************************************************************
  (5)  007054  000004                      TST47:  SCOPE
  (3)                                                                      ;/CLEAR THE STATUS REGISTER.
  (3)                                                                      ;/SET BIT 4.
  (3)                                                                      ;/SET FOR ERROR TYPEOUT S/B.
  (3)                                                                       ;/READ THE STATUS REGISTER.
  (3)  007056  012737  000020  001124             MOV     #BIT4,$GDDAT
  (4)
  (4)                                      ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
  (4)
  (4)                                      ;*      MOV     @BSR,$BDDAT     ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
  (3)  007104  023737  001124  001126             CMP     $GDDAT,$BDDAT   ;/DID BIT 4 AND ONLY BIT 4 SET?
  (3)  007112  001402                             BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
  (4)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  007114  104005                             ERROR   5               ;/ERROR CLOCK BS STATUS REGISTER.
  (3)                                                                      ;/BIT 4 FAILED TO BIT SET.
  (4)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  007116  000416                             BR      2$              ;/BR TO END SUBTEST.
  (3)  007120                              1$:                            ;/TRY CLEARING BIT 4.
  (3)  007120  005037  001124                     CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
  (3)                                                                      ;/NOW READ IT BACK.
  (4)
  (4)                                      ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
  (4)
  (4)                                      ;*      MOV     @BSR,$BDDAT     ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
  (3)  007144  005737  001126                     TST     $BDDAT
  (3)  007150  001401                             BEQ     2$              ;/IF ZERO-NO ERROR!
  (4)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  007152  104005                             ERROR   5               ;/ERROR-CLOCK B STATUS REGISTER.
  (3)                                                                      ;/BIT 4 FAILED TO CLEAR.
  (4)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  007154                              2$:
  (2)
```

```
(3)                                     ;/#
(7)                                     ;;*************************************************************
(6)                                     ;*TEST 50       *TEST THAT CLOCK B STATUS REGISTER BIT 3 CAN BE SET AND CLEARED
(7)                                     ;*
(7)                                     ;*CLOCK B STATUS REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
(7)                                     ;*F/FS OR GATES
(8)                                     ;*
(8)                                     ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
(8)                                     ;*
(7)                                     ;*
(6)                                     ;;*************************************************************
(5)  007154  000004                     TST50:  SCOPE
(3)                                                                     ;/CLEAR THE STATUS REGISTER.
(3)                                                                     ;/SET BIT 3.
(3)                                                                     ;/SET FOR ERROR TYPEOUT S/B.
(3)                                                                      ;/READ THE STATUS REGISTER.
(3)  007156  012737  000010  001124             MOV     #BIT3,$GDDAT
(4)
(4)                                     ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
(4)
(4)                                     ;*      MOV     @BSR,$BDDAT     ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
(3)  007204  023737  001124  001126             CMP     $GDDAT,$BDDAT   ;/DID BIT 3 AND ONLY BIT 3 SET?
(3)  007212  001402                             BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
(4)
          ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  007214  104005                             ERROR   5               ;/ERROR CLOCK BS STATUS REGISTER.
(3)                                                                     ;/BIT 3 FAILED TO BIT SET.
(4)
          ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  007216  000416                             BR      2$              ;/BR TO END SUBTEST.
(5)  007220                             1$:                             ;/TRY CLEARING BIT 3.
(3)  007220  005037  001124                     CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
(3)                                                                     ;/NOW READ IT BACK.
(4)
(4)                                     ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
(4)
(4)                                     ;*      MOV     @BSR,$BDDAT     ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
(3)  007244  005737  001126                     TST     $BDDAT
(3)  007250  001401                             BEQ     2$              ;/IF ZERO-NO ERROR!
(4)
          ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  007252  104005                             ERROR   5               ;/ERROR-CLOCK B STATUS REGISTER.
(3)                                                                     ;/BIT 3 FAILED TO CLEAR.
(4)
          ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  007254                             2$:
(2)
```

```
(3)                                             ;/#
(7)                                     ;;*************************************************************
(6)                                     ;*TEST 51       *TEST THAT CLOCK B STATUS REGISTER BIT 2 CAN BE SET AND CLEARED
(7)                                     ;*
(7)                                     ;*CLOCK B STATUS REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
(7)                                     ;*F/FS OR GATES
(8)                                     ;*
(8)                                     ;* PROBABLE SYNC POINT FOR THIS TEST:: ''DEVICE OUT'' 2 OCCURANCES PER PASS
(8)                                     ;*
(7)                                     ;*
(6)                                     ;;*************************************************************
(5)  007254  000004                      TST51:  SCOPE
(3)                                                                     ;/CLEAR THE STATUS REGISTER.
(3)                                                                     ;/SET BIT 2.
(3)                                                                     ;/SET FOR ERROR TYPEOUT S/B.
(3)                                                                      ;/READ THE STATUS REGISTER.
(3)  007256  012737  000004  001124             MOV     #BIT2,$GDDAT
(4)
(4)                                     ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
(4)
(4)                                     ;*      MOV     @BSR,$BDDAT     ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
(3)  007304  023737  001124  001126             CMP     $GDDAT,$BDDAT   ;/DID BIT 2 AND ONLY BIT 2 SET?
(3)  007312  001402                             BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
(4)
            ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  007314  104005                             ERROR   5               ;/ERROR CLOCK BS STATUS REGISTER.
(3)                                                                     ;/BIT 2 FAILED TO BIT SET.
(4)
            ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  007316  000416                             BR      2$              ;/BR TO END SUBTEST.
(3)  007320                             1$:                             ;/TRY CLEARING BIT 2.
(3)  007320  005037  001124                     CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
(3)                                                                     ;/NOW READ IT BACK.
(4)
(4)                                     ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
(4)
(4)                                     ;*      MOV     @BSR,$BDDAT     ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
(3)  007344  005737  001126                     TST     $BDDAT
(3)  007350  001401                             BEQ     2$              ;/IF ZERO-NO ERROR!
(4)
            ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  007352  104005                             ERROR   5               ;/ERROR-CLOCK B STATUS REGISTER.
(3)                                                                     ;/BIT 2 FAILED TO CLEAR.
(4)
            ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  007354                             2$:
(2)
```

```
  (3)                                            ;/#
  (7)                                          ;;*****************************************************************
  (6)                                          ;*TEST 52        *TEST THAT CLOCK B STATUS REGISTER BIT 1 CAN BE SET AND CLEARED
  (7)                                          ;*
  (7)                                          ;*CLOCK B STATUS REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
  (7)                                          ;*F/FS OR GATES
  (8)                                          ;*
  (8)                                          ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
  (8)                                          ;*
  (7)                                          ;*
  (6)                                          ;;*****************************************************************
  (5)  007354  000004                          TST52:  SCOPE
  (3)                                                                          ;/CLEAR THE STATUS REGISTER.
  (3)                                                                          ;/SET BIT 1.
  (3)                                                                          ;/SET FOR ERROR TYPEOUT S/B.
  (3)                                                                           ;/READ THE STATUS REGISTER.
  (3)  007356  012737  000002  001124                  MOV     #BIT1,$GDDAT
  (4)
  (4)                                          ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
  (4)
  (4)                                          ;*      MOV     @BSR,$BDDAT     ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
  (3)  007404  023737  001124  001126                  CMP     $GDDAT,$BDDAT   ;/DID BIT 1 AND ONLY BIT 1 SET?
  (3)  007412  001402                                  BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
  (4)
                    ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  007414  104005                                  ERROR   5               ;/ERROR CLOCK BS STATUS REGISTER.
  (3)                                                                          ;/BIT 1 FAILED TO BIT SET.
  (4)
                    ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  007416  000416                                  BR      2$              ;/BR TO END SUBTEST.
  (3)  007420                                  1$:                             ;/TRY CLEARING BIT 1.
  (3)  007420  005037  001124                          CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
  (3)                                                                          ;/NOW READ IT BACK.
  (4)
  (4)                                          ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
  (4)
  (4)                                          ;*      MOV     @BSR,$BDDAT     ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
  (3)  007444  005737  001126                          TST     $BDDAT
  (3)  007450  001401                                  BEQ     2$              ;/IF ZERO-NO ERROR!
  (4)
                    ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  007452  104005                                  ERROR   5               ;/ERROR-CLOCK B STATUS REGISTER.
  (3)                                                                          ;/BIT 1 FAILED TO CLEAR.
  (4)
                    ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  007454                                  2$:
  (2)
  (3)                                          ;/#
  (7)                                  ;;*****************************************************************
  (6)                                  ;*TEST 53       *TEST THAT CLOCK B STATUS REGISTER BIT 0 CAN BE SET AND CLEARED
  (7)                                  ;*
  (7)                                  ;*CLOCK B STATUS REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
  (7)                                  ;*F/FS OR GATES
  (8)                                  ;*
  (8)                                  ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
  (8)                                  ;*
  (7)                                  ;*
  (6)                                  ;;*****************************************************************
  (5)  007454  000004                  TST53:  SCOPE
  (3)                                                                  ;/CLEAR THE STATUS REGISTER.
  (3)                                                                  ;/SET BIT 0.
  (3)                                                                  ;/SET FOR ERROR TYPEOUT S/B.
  (3)                                                                   ;/READ THE STATUS REGISTER.
  (3)  007456  012737  000001  001124          MOV     #BIT0,$GDDAT
  (4)
  (4)                                  ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
  (4)
  (4)                                  ;*      MOV     @BSR,$BDDAT     ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
  (3)  007504  023737  001124  001126          CMP     $GDDAT,$BDDAT   ;/DID BIT 0 AND ONLY BIT 0 SET?
  (3)  007512  001402                          BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
  (4)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  007514  104005                          ERROR   5               ;/ERROR CLOCK BS STATUS REGISTER.
  (3)                                                                  ;/BIT 0 FAILED TO BIT SET.
  (4)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  007516  000416                          BR      2$              ;/BR TO END SUBTEST.
  (3)  007520                          1$:                             ;/TRY CLEARING BIT 0.
  (3)  007520  005037  001124                  CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
  (3)                                                                  ;/NOW READ IT BACK.
  (4)
  (4)                                  ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
  (4)
  (4)                                  ;*      MOV     @BSR,$BDDAT     ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
  (3)  007544  005737  001126                  TST     $BDDAT
  (3)  007550  001401                          BEQ     2$              ;/IF ZERO-NO ERROR!
  (4)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  007552  104005                          ERROR   5               ;/ERROR-CLOCK B STATUS REGISTER.
  (3)                                                                  ;/BIT 0 FAILED TO CLEAR.
  (4)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  007554                          2$:
```

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                                                            N  6
LPA-KW11K DIAGNOSTIC MD-11-CRLPG-C        MACY11 30G(1063)  24-OCT-80  09:38  PAGE 3-57
CRLPGC.P11     18-AUG-80 09:15            T53       *TEST THAT CLOCK B STATUS REGISTER BIT 0 CAN BE SET AND CLEARED              SEQ 0078

  (3)                                               ;/#
  (7)                                       ;;*****************************************************************
  (6)                                       ;*TEST 54        *TEST THAT CLOCK B BUFFER REGISTER BIT 0 CAN BE SET AND CLEARED
  (7)                                       ;*
  (7)                                       ;*CLOCK B BUFFER REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
  (7)                                       ;*F/FS OR GATES
  (8)                                       ;*
  (8)                                       ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
  (8)                                       ;*
  (7)                                       ;*
  (6)                                       ;;*****************************************************************
  (5)  007554  000004                       TST54:  SCOPE
  (3)                                                                         ;/CLEAR THE BUFFER REGISTER.
  (3)                                                                         ;/SET BIT 0.
  (3)                                                                         ;/SET FOR ERROR TYPEOUT S/B.
  (3)                                                                          ;/READ THE BUFFER REGISTER.
  (3)  007556  012737  000001  001124               MOV     #BIT0,$GDDAT
  (4)
  (4)                                       ;*      MOV     $GDDAT,@BBR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
  (4)
  (4)                                       ;*      MOV     @BBR,$BDDAT       ;/READ DEVICE REG BBR,PUT DATA IN $BDDAT.
  (3)  007604  023737  001124  001126               CMP     $GDDAT,$BDDAT     ;/DID BIT 0 AND ONLY BIT 0 SET?
  (3)  007612  001402                               BEQ     1$                ;/IF SO-LETS TRY CLEARING IT.
  (4)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  007614  104006                               ERROR   6                 ;/ERROR CLOCK BS BUFFER REGISTER.
  (3)                                                                         ;/BIT 0 FAILED TO BIT SET.
  (4)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  007616  000416                               BR      2$                ;/BR TO END SUBTEST.
  (3)  007620                               1$:                               ;/TRY CLEARING BIT 0.
  (3)  007620  005037  001124                       CLR     $GDDAT             ;/CLEAR S/B FOR TYPEOUT IF ANY.
  (3)                                                                         ;/NOW READ IT BACK.
  (4)
  (4)                                       ;*      MOV     $GDDAT,@BBR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
  (4)
  (4)                                       ;*      MOV     @BBR,$BDDAT       ;/READ DEVICE REG BBR,PUT DATA IN $BDDAT.
  (3)  007644  005737  001126                       TST     $BDDAT
  (3)  007650  001401                               BEQ     2$                ;/IF ZERO-NO ERROR!
  (4)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  007652  104006                               ERROR   6                 ;/ERROR-CLOCK B BUFFER REGISTER.
  (3)                                                                         ;/BIT 0 FAILED TO CLEAR.
  (4)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  007654                               2$:
```

```
 (3)                                             ;/#
 (7)                                     ;;*****************************************************************
 (6)                                     ;*TEST 55        *TEST THAT CLOCK B BUFFER REGISTER BIT 1 CAN BE SET AND CLEARED
 (7)                                     ;*
 (7)                                     ;*CLOCK B BUFFER REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
 (7)                                     ;*F/FS OR GATES
 (8)                                     ;*
 (8)                                     ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
 (8)                                     ;*
 (7)                                     ;*
 (6)                                     ;;*****************************************************************
 (5)  007654  000004                     TST55:  SCOPE
 (3)                                                                      ;/CLEAR THE BUFFER REGISTER.
 (3)                                                                      ;/SET BIT 1.
 (3)                                                                      ;/SET FOR ERROR TYPEOUT S/B.
 (3)                                                                       ;/READ THE BUFFER REGISTER.
 (3)  007656  012737  000002  001124             MOV      #BIT1,$GDDAT
 (4)
 (4)                                     ;*      MOV      $GDDAT,@BBR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
 (4)
 (4)                                     ;*      MOV      @BBR,$BDDAT      ;/READ DEVICE REG BBR,PUT DATA IN $BDDAT.
 (3)  007704  023737  001124  001126             CMP      $GDDAT,$BDDAT    ;/DID BIT 1 AND ONLY BIT 1 SET?
 (3)  007712  001402                             BEQ      1$               ;/IF SO-LETS TRY CLEARING IT.
 (4)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  007714  104006                             ERROR    6                ;/ERROR CLOCK BS BUFFER REGISTER.
 (3)                                                                       ;/BIT 1 FAILED TO BIT SET.
 (4)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  007716  000416                             BR       2$               ;/BR TO END SUBTEST.
 (3)  007720                             1$:                               ;/TRY CLEARING BIT 1.
 (3)  007720  005037  001124                     CLR      $GDDAT            ;/CLEAR S/B FOR TYPEOUT IF ANY.
 (3)                                                                       ;/NOW READ IT BACK.
 (4)
 (4)                                     ;*      MOV      $GDDAT,@BBR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
 (4)
 (4)                                     ;*      MOV      @BBR,$BDDAT      ;/READ DEVICE REG BBR,PUT DATA IN $BDDAT.
 (3)  007744  005737  001126                     TST      $BDDAT
 (3)  007750  001401                             BEQ      2$               ;/IF ZERO-NO ERROR!
 (4)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  007752  104006                             ERROR    6                ;/ERROR-CLOCK B BUFFER REGISTER.
 (3)                                                                       ;/BIT 1 FAILED TO CLEAR.
 (4)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  007754                             2$:
  (3)                                               ;/#
  (7)                                    ;;********************************************************************
  (6)                                    ;*TEST 56        *TEST THAT CLOCK B BUFFER REGISTER BIT 2 CAN BE SET AND CLEARED
  (7)                                    ;*
  (7)                                    ;*CLOCK B BUFFER REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
  (7)                                    ;*F/FS OR GATES
  (8)                                    ;*
  (8)                                    ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
  (8)                                    ;*
  (7)                                    ;*
  (6)                                    ;;********************************************************************
  (5)  007754  000004                    TST56:  SCOPE
  (3)                                                                     ;/CLEAR THE BUFFER REGISTER.
  (3)                                                                     ;/SET BIT 2.
  (3)                                                                     ;/SET FOR ERROR TYPEOUT S/B.
  (3)                                                                      ;/READ THE BUFFER REGISTER.
  (3)  007756  012737  000004  001124            MOV     #BIT2,$GDDAT
  (4)
  (4)                                    ;*      MOV     $GDDAT,@BBR        ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
  (4)
  (4)                                    ;*      MOV     @BBR,$BDDAT        ;/READ DEVICE REG BBR,PUT DATA IN $BDDAT.
  (3)  010004  023737  001124  001126            CMP     $GDDAT,$BDDAT      ;/DID BIT 2 AND ONLY BIT 2 SET?
  (3)  010012  001402                            BEQ     1$                 ;/IF SO-LETS TRY CLEARING IT.
  (4)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  010014  104006                            ERROR   6                  ;/ERROR CLOCK BS BUFFER REGISTER.
  (3)                                                                     ;/BIT 2 FAILED TO BIT SET.
  (4)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  010016  000416                            BR      2$                 ;/BR TO END SUBTEST.
  (3)  010020                            1$:                                ;/TRY CLEARING BIT 2.
  (3)  010020  005037  001124                    CLR     $GDDAT              ;/CLEAR S/B FOR TYPEOUT IF ANY.
  (3)                                                                     ;/NOW READ IT BACK.
  (4)
  (4)                                    ;*      MOV     $GDDAT,@BBR        ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
  (4)
  (4)                                    ;*      MOV     @BBR,$BDDAT        ;/READ DEVICE REG BBR,PUT DATA IN $BDDAT.
  (3)  010044  005737  001126                    TST     $BDDAT
  (3)  010050  001401                            BEQ     2$                 ;/IF ZERO-NO ERROR!
  (4)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  010052  104006                            ERROR   6                  ;/ERROR-CLOCK B BUFFER REGISTER.
  (3)                                                                     ;/BIT 2 FAILED TO CLEAR.
  (4)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  010054                            2$:
   (3)                                        ;/#
   (7)                                       ;;**************************************************************
   (6)                                       ;*TEST 57       *TEST THAT CLOCK B BUFFER REGISTER BIT 3 CAN BE SET AND CLEARED
   (7)                                       ;*
   (7)                                       ;*CLOCK B BUFFER REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
   (7)                                       ;*F/FS OR GATES
   (8)                                       ;*
   (8)                                       ;* PROBABLE SYNC POINT FOR THIS TEST:: ''DEVICE OUT'' 2 OCCURANCES PER PASS
   (8)                                       ;*
   (7)                                       ;*
   (6)                                       ;;**************************************************************
   (5)  010054  000004                       TST57:  SCOPE
   (3)                                                                       ;/CLEAR THE BUFFER REGISTER.
   (3)                                                                       ;/SET BIT 3.
   (3)                                                                       ;/SET FOR ERROR TYPEOUT S/B.
   (3)                                                                        ;/READ THE BUFFER REGISTER.
   (3)  010056  012737  000010  001124               MOV     #BIT3,$GDDAT
   (4)
   (4)                                       ;*      MOV     $GDDAT,@BBR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
   (4)
   (4)                                       ;*      MOV     @BBR,$BDDAT     ;/READ DEVICE REG BBR,PUT DATA IN $BDDAT.
   (3)  010104  023737  001124  001126               CMP     $GDDAT,$BDDAT   ;/DID BIT 3 AND ONLY BIT 3 SET?
   (3)  010112  001402                               BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
   (4)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$$

   (3)  010114  104006                               ERROR   6               ;/ERROR CLOCK BS BUFFER REGISTER.
   (3)                                                                       ;/BIT 3 FAILED TO BIT SET.
   (4)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$$

   (3)  010116  000416                               BR      2$              ;/BR TO END SUBTEST.
   (3)  010120                               1$:                             ;/TRY CLEARING BIT 3.
   (3)  010120  005037  001124                       CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
   (3)                                                                       ;/NOW READ IT BACK.
   (4)
   (4)                                       ;*      MOV     $GDDAT,@BBR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
   (4)
   (4)                                       ;*      MOV     @BBR,$BDDAT     ;/READ DEVICE REG BBR,PUT DATA IN $BDDAT.
   (3)  010144  005737  001126                       TST     $BDDAT
   (3)  010150  001401                               BEQ     2$              ;/IF ZERO-NO ERROR!
   (4)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$$

   (3)  010152  104006                               ERROR   6               ;/ERROR-CLOCK B BUFFER REGISTER.
   (3)                                                                       ;/BIT 3 FAILED TO CLEAR.
   (4)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$$

   (3)  010154                               2$:
```

```
 (3)                                            ;/#
 (7)                                    ;;*****************************************************************
 (6)                                    ;*TEST 60       *TEST THAT CLOCK B BUFFER REGISTER BIT 4 CAN BE SET AND CLEARED
 (7)                                    ;*
 (7)                                    ;*CLOCK B BUFFER REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
 (7)                                    ;*F/FS OR GATES
 (8)                                    ;*
 (8)                                    ;* PROBABLE SYNC POINT FOR THIS TEST:: ''DEVICE OUT'' 2 OCCURANCES PER PASS
 (8)                                    ;*
 (7)                                    ;*
 (6)                                    ;;*****************************************************************
 (5)  010154  000004                    TST60:  SCOPE
 (3)                                                                    ;/CLEAR THE BUFFER REGISTER.
 (3)                                                                    ;/SET BIT 4.
 (3)                                                                    ;/SET FOR ERROR TYPEOUT S/B.
 (3)                                                                     ;/READ THE BUFFER REGISTER.
 (3)  010156  012737  000020  001124            MOV     #BIT4,$GDDAT
 (4)
 (4)                                    ;*      MOV     $GDDAT,@BBR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
 (4)
 (4)                                    ;*      MOV     @BBR,$BDDAT     ;/READ DEVICE REG BBR,PUT DATA IN $BDDAT.
 (3)  010204  023737  001124  001126            CMP     $GDDAT,$BDDAT   ;/DID BIT 4 AND ONLY BIT 4 SET?
 (3)  010212  001402                            BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
 (4)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  010214  104006                            ERROR   6               ;/ERROR CLOCK BS BUFFER REGISTER.
 (3)                                                                    ;/BIT 4 FAILED TO BIT SET.
 (4)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  010216  000416                            BR      2$              ;/BR TO END SUBTEST.
 (3)  010220                            1$:                             ;/TRY CLEARING BIT 4.
 (3)  010220  005037  001124                    CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
 (3)                                                                    ;/NOW READ IT BACK.
 (4)
 (4)                                    ;*      MOV     $GDDAT,@BBR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
 (4)
 (4)                                    ;*      MOV     @BBR,$BDDAT     ;/READ DEVICE REG BBR,PUT DATA IN $BDDAT.
 (3)  010244  005737  001126                    TST     $BDDAT
 (3)  010250  001401                            BEQ     2$              ;/IF ZERO-NO ERROR!
 (4)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  010252  104006                            ERROR   6               ;/ERROR-CLOCK B BUFFER REGISTER.
 (3)                                                                    ;/BIT 4 FAILED TO CLEAR.
 (4)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  010254                            2$:
```

```
 (3)                                                ;/#
 (7)                                    ;;*****************************************************************
 (6)                                    ;*TEST 61       *TEST THAT CLOCK B BUFFER REGISTER BIT 5 CAN BE SET AND CLEARED
 (7)                                    ;*
 (7)                                    ;*CLOCK B BUFFER REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
 (7)                                    ;*F/FS OR GATES
 (8)                                    ;*
 (8)                                    ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
 (8)                                    ;*
 (7)                                    ;*
 (6)                                    ;;*****************************************************************
 (5)  010254  000004                    TST61:  SCOPE
 (3)                                                                    ;/CLEAR THE BUFFER REGISTER.
 (3)                                                                    ;/SET BIT 5.
 (3)                                                                    ;/SET FOR ERROR TYPEOUT S/B.
 (3)                                                                     ;/READ THE BUFFER REGISTER.
 (3)  010256  012737  000040  001124            MOV     #BIT5,$GDDAT
 (4)
 (4)                                    ;*      MOV     $GDDAT,@BBR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
 (4)
 (4)                                    ;*      MOV     @BBR,$BDDAT     ;/READ DEVICE REG BBR,PUT DATA IN $BDDAT.
 (3)  010304  023737  001124  001126            CMP     $GDDAT,$BDDAT   ;/DID BIT 5 AND ONLY BIT 5 SET?
 (3)  010312  001402                            BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
 (4)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  010314  104006                            ERROR   6               ;/ERROR CLOCK BS BUFFER REGISTER.
 (3)                                                                    ;/BIT 5 FAILED TO BIT SET.
 (4)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  010316  000416                            BR      2$              ;/BR TO END SUBTEST.
 (3)  010320                            1$:                             ;/TRY CLEARING BIT 5.
 (3)  010320  005037  001124                    CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
 (3)                                                                    ;/NOW READ IT BACK.
 (4)
 (4)                                    ;*      MOV     $GDDAT,@BBR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
 (4)
 (4)                                    ;*      MOV     @BBR,$BDDAT     ;/READ DEVICE REG BBR,PUT DATA IN $BDDAT.
 (3)  010344  005737  001126                    TST     $BDDAT
 (3)  010350  001401                            BEQ     2$              ;/IF ZERO-NO ERROR!
 (4)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  010352  104006                            ERROR   6               ;/ERROR-CLOCK B BUFFER REGISTER.
 (3)                                                                    ;/BIT 5 FAILED TO CLEAR.
 (4)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (3)  010354                            2$:
```

```
(3)                                          ;/#
(7)                                          ;;***************************************************************
(6)                                          ;*TEST 62        *TEST THAT CLOCK B BUFFER REGISTER BIT 6 CAN BE SET AND CLEARED
(7)                                          ;*
(7)                                          ;*CLOCK B BUFFER REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
(7)                                          ;*F/FS OR GATES
(8)                                          ;*
(8)                                          ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
(8)                                          ;*
(7)                                          ;*
(6)                                          ;;***************************************************************
(5)  010354  000004                          TST62:  SCOPE
(3)                                                                          ;/CLEAR THE BUFFER REGISTER.
(3)                                                                          ;/SET BIT 6.
(3)                                                                          ;/SET FOR ERROR TYPEOUT S/B.
(3)                                                                           ;/READ THE BUFFER REGISTER.
(3)  010356  012737  000100  001124                  MOV     #BIT6,$GDDAT
(4)
(4)                                          ;*      MOV     $GDDAT,@BBR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
(4)
(4)                                          ;*      MOV     @BBR,$BDDAT     ;/READ DEVICE REG BBR,PUT DATA IN $BDDAT.
(3)  010404  023737  001124  001126                  CMP     $GDDAT,$BDDAT   ;/DID BIT 6 AND ONLY BIT 6 SET?
(3)  010412  001402                                  BEQ     1$              ;/IF SO-LETS TRY CLEARING IT.
(4)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  010414  104006                                  ERROR   6               ;/ERROR CLOCK BS BUFFER REGISTER.
(3)                                                                          ;/BIT 6 FAILED TO BIT SET.
(4)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  010416  000416                                  BR      2$              ;/BR TO END SUBTEST.
(3)  010420                                  1$:                             ;/TRY CLEARING BIT 6.
(3)  010420  005037  001124                          CLR     $GDDAT           ;/CLEAR S/B FOR TYPEOUT IF ANY.
(3)                                                                          ;/NOW READ IT BACK.
(4)
(4)                                          ;*      MOV     $GDDAT,@BBR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
(4)
(4)                                          ;*      MOV     @BBR,$BDDAT     ;/READ DEVICE REG BBR,PUT DATA IN $BDDAT.
(3)  010444  005737  001126                          TST     $BDDAT
(3)  010450  001401                                  BEQ     2$              ;/IF ZERO-NO ERROR!
(4)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  010452  104006                                  ERROR   6               ;/ERROR-CLOCK B BUFFER REGISTER.
(3)                                                                          ;/BIT 6 FAILED TO CLEAR.
(4)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(3)  010454                                  2$:
  (3)                                          :/#
  (7)                                         ;;*****************************************************************
  (6)                                         ;*TEST 63        *TEST THAT CLOCK B BUFFER REGISTER BIT 7 CAN BE SET AND CLEARED
  (7)                                         ;*
  (7)                                         ;*CLOCK B BUFFER REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
  (7)                                         ;*F/FS OR GATES
  (8)                                         ;*
  (8)                                         ;* PROBABLE SYNC POINT FOR THIS TEST:: ''DEVICE OUT'' 2 OCCURANCES PER PASS
  (8)                                         ;*
  (7)                                         ;*
  (6)                                         ;;*****************************************************************
  (5)  010454  000004                         TST63:  SCOPE
  (3)                                                                          ;/CLEAR THE BUFFER REGISTER.
  (3)                                                                          ;/SET BIT 7.
  (3)                                                                          ;/SET FOR ERROR TYPEOUT S/B.
  (3)                                                                           ;/READ THE BUFFER REGISTER.
  (3)  010456  012737  000200  001124                 MOV     #BIT7,$GDDAT
  (4)
  (4)                                         ;*      MOV     $GDDAT,@BBR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
  (4)
  (4)                                         ;*      MOV     @BBR,$BDDAT      ;/READ DEVICE REG BBR,PUT DATA IN $BDDAT.
  (3)  010504  023737  001124  001126                 CMP     $GDDAT,$BDDAT    ;/DID BIT 7 AND ONLY BIT 7 SET?
  (3)  010512  001402                                 BEQ     1$               ;/IF SO-LETS TRY CLEARING IT.
  (4)
                   ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  010514  104006                                 ERROR   6                ;/ERROR CLOCK BS BUFFER REGISTER.
  (3)                                                                          ;/BIT 7 FAILED TO BIT SET.
  (4)
                   ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  010516  000416                                 BR      2$               ;/BR TO END SUBTEST.
  (5)  010520                                 1$:                              ;/TRY CLEARING BIT 7.
  (3)  010520  005037  001124                         CLR     $GDDAT            ;/CLEAR S/B FOR TYPEOUT IF ANY.
  (3)                                                                          ;/NOW READ IT BACK.
  (4)
  (4)                                         ;*      MOV     $GDDAT,@BBR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
  (4)
  (4)                                         ;*      MOV     @BBR,$BDDAT      ;/READ DEVICE REG BBR,PUT DATA IN $BDDAT.
  (3)  010544  005737  001126                         TST     $BDDAT
  (3)  010550  001401                                 BEQ     2$               ;/IF ZERO-NO ERROR!
  (4)
                   ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  010552  104006                                 ERROR   6                ;/ERROR-CLOCK B BUFFER REGISTER.
  (3)                                                                          ;/BIT 7 FAILED TO CLEAR.
  (4)
                   ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (3)  010554                                 2$:
 1779                                         .SBTTL  *
 1780                                         .SBTTL  * PHASE 2 ADVANCED BASIC LOGIC TESTS
 1781                                         .SBTTL  *
 1782
 1788
 1789                                         ;;*****************************************************************
 (3)                                       ;*TEST 64        *TEST THAT CLOCK A'S COUNT REGISTER IS CLEAR
 (4)
 (5)                                       ;*
 (5)                                       ;*CLOCK A COUNT REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
 (5)                                       ;*F/FS OR GATES
 (6)                                       ;*
 (6)                                       ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
 (6)                                       ;*
 (5)                                       ;*
 (4)
 (3)                                       ;;*****************************************************************
 (2)   010554  000004                      TST64:  SCOPE

                                                                         ;SELECT MODE 0.
                                                                         ;CLEAR THE BUFFER REGISTER. BUFFER
                                                                         ;REGISTER WILL BE TRANSFERRED TO
                                                                         ;COUNT REGISTER SINCE THIS IS MODE 0.
       010556  005037  001124                      CLR     $GDDAT

 (1)                                       ;*      MOV     $GDDAT,@ASR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR

 (1)                                       ;*      MOV     $GDDAT,@ABR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR

       010602  005037  001124                      CLR     $GDDAT            ;EXPECT TO READ BACK ALL 0'S.
                                                                         ;READ THE COUNT REGISTER - IT SHOULD BE CLEAR.

 (1)                                       ;*      MOV     @ACR,$BDDAT       ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
       010616  005737  001126                      TST     $BDDAT
       010622  001401                              BEQ     1$                ;BR IF YES TO NEXT TEST


               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

       010624  104004                              ERROR   4                 ;ERROR - CLOCK A'S COUNTER REGISTER
                                                                         ;NOT CLEAR.


               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

       010626                              1$:


                                           ;;*****************************************************************
 (3)                                       ;*TEST 65        *TEST CLOCK A'S COUNT REGISTER WITH 125252 PATTERN
 (4)
 (5)                                       ;*
 (5)                                       ;*CLOCK A COUNT REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
 (5)                                       ;*F/FS OR GATES
 (6)                                       ;*
 (6)                                       ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
 (6)                                       ;*
 (5)                                       ;*
 (4)
 (3)                                       ;;*****************************************************************
 (2)   010626  000004                      TST65:  SCOPE

                                                                         ;SELECT MODE 0.
```

```
                                                                 ;LOAD THE BUFFER REGISTER WITH
                                                                 ;PATTERN 125252. IT WILL BE
                                                                 ;TRANSFERRED TO THE COUNT REGISTER
                                                                 ;SINCE THIS IS MODE 0.
010630  005037  001124                  CLR     $GDDAT

                                ;*      MOV     $GDDAT,@ASR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR

010644  012737  125252  001124          MOV     #125252,$GDDAT   ;SET EXPECTED TO PATTERN IN CASE OF
                                                                 ;NEED OF ERROR TYPEOUT.
                                                                 ;READ THE COUNT REGISTER

                                ;*      MOV     $GDDAT,@ABR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR

                                ;*      MOV     @ACR,$BDDAT      ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.

010672  023737  001124  001126          CMP     $GDDAT,$BDDAT    ;DID ALL THE BITS AND NO OTHER BITS
                                                                 ;COME THROUGH?
010700  001401                          BEQ     1$               ;BR IF YES TO NEXT TEST.


        ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$
010702  104004                          ERROR   4                ;DATA ERROR CLOCK A   PATTERN "125252"
                                                                 ;FAILED TO TRANSFER PROPERLY BETWEEN
                                                                 ;BUFFER AND COUNT REGISTERS.


        ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$
010704                          1$:


                                ;;*****************************************************************
                                ;*TEST 66        *TEST CLOCK A'S COUNT REGISTER WITH 052525 PATTERN

                                ;*
                                ;*CLOCK A COUNT REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
                                ;*F/FS OR GATES
                                ;*
                                ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
                                ;*
                                ;*

                                ;;*****************************************************************
010704  000004                  TST66:  SCOPE

                                                                 ;SELECT MODE 0.
010706  005037  001124                  CLR     $GDDAT

                                ;*      MOV     $GDDAT,@ASR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
                                                                 ;LOAD THE BUFFER REGISTER WITH
                                                                 ;PATTERN 052525. IT WILL BE
                                                                 ;TRANSFERRED TO THE COUNT REGISTER
                                                                 ;SINCE THIS IS MODE 0.

010722  012737  052525  001124          MOV     #052525,$GDDAT   ;SET EXPECTED TO PATTERN IN CASE OF
```

```
                                                                      ;NEED OF ERROR TYPEOUT.
                                                                      ;READ THE COUNT REGISTER

                                          ;*        MOV     $GDDAT,@ABR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR

                                          ;*        MOV     @ACR,$BDDAT       ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.

010750  023737  001124  001126                      CMP     $GDDAT,$BDDAT     ;DID ALL THE BITS AND NO OTHER BITS
                                                                      ;COME THROUGH?
010756  001401                                      BEQ     1$                ;BR IF YES TO NEXT TEST.


             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

010760  104004                                      ERROR   4                 ;DATA ERROR CLOCK A   PATTERN "052525"
                                                                      ;FAILED TO TRANSFER PROPERLY BETWEEN
                                                                      ;BUFFER AND COUNT REGISTERS.


             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

010762                                    1$:



                                          ;;*****************************************************************
                                          ;*TEST 67         *TEST THAT CLOCK B'S COUNT REGISTER IS CLEAR

                                          ;*
                                          ;*CLOCK B COUNT REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
                                          ;*F/FS OR GATES
                                          ;*
                                          ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
                                          ;*
                                          ;*

                                          ;;*****************************************************************
010762  000004                            TST67:  SCOPE

                                                                      ;SELECT MODE 0.
                                                                      ;CLEAR THE BUFFER REGISTER. BUFFER
                                                                      ;REGISTER WILL BE TRANSFERRED TO
                                                                      ;COUNT REGISTER SINCE THIS IS MODE 0.
010764  005037  001124                              CLR     $GDDAT

                                          ;*        MOV     $GDDAT,@BSR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR

                                          ;*        MOV     $GDDAT,@BBR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR

011010  005037  001124                              CLR     $GDDAT            ;EXPECT TO READ BACK ALL 0'S.
                                                                      ;READ THE COUNT REGISTER - IT SHOULD BE CLEAR.

                                          ;*        MOV     @BCR,$BDDAT       ;/READ DEVICE REG BCR,PUT DATA IN $BDDAT.
011024  005737  001126                              TST     $BDDAT
011030  001401                                      BEQ     1$                ;BR IF YES TO NEXT TEST
```

```
          ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

      011032  104007                      ERROR    7                 ;ERROR - CLOCK B'S COUNTER REGISTER
                                                                     ;NOT CLEAR.


          ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

      011034                          1$:



                                      ;;*************************************************************
 (3)                                  ;*TEST 70        *TEST CLOCK B'S COUNT REGISTER WITH 125 PATTERN
 (4)
 (5)                                  ;*
 (5)                                  ;*CLOCK B COUNT REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
 (5)                                  ;*F/FS OR GATES
 (6)                                  ;*
 (6)                                  ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
 (6)                                  ;*
 (5)                                  ;*
 (4)
 (3)                                  ;;*************************************************************
 (2)  011034  000004                  TST70:  SCOPE

                                                                     ;SELECT MODE 0.
      011036  005037  001124                  CLR     $GDDAT

 (1)                                  ;*      MOV     $GDDAT,@BSR    ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
                                                                     ;LOAD THE BUFFER REGISTER WITH
                                                                     ;PATTERN 125. IT WILL BE
                                                                     ;TRANSFERRED TO THE COUNT REGISTER
                                                                     ;SINCE THIS IS MODE 0.

      011052  012737  000125  001124          MOV     #125,$GDDAT    ;SET EXPECTED TO PATTERN IN CASE OF

 (1)                                  ;*      MOV     $GDDAT,@BBR    ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
                                                                     ;NEED OF ERROR TYPEOUT.
                                                                     ;READ THE COUNT REGISTER

 (1)                                  ;*      MOV     @BCR,$BDDAT    ;/READ DEVICE REG BCR,PUT DATA IN $BDDAT.

      011100  023737  001124  001126          CMP     $GDDAT,$BDDAT  ;DID ALL THE BITS AND NO OTHER BITS
                                                                     ;COME THROUGH?
      011106  001401                          BEQ     1$             ;BR IF YES TO NEXT TEST.



          ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

      011110  104007                          ERROR   7              ;DATA ERROR CLOCK B - PATTERN "125"
                                                                     ;FAILED TO TRANSFER PROPERLY BETWEEN
                                                                     ;BUFFER AND COUNT REGISTERS.



          ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$
```

```
011112                                  1$:


                                        ;;*******************************************************************
                                        ;*TEST 71        *TEST CLOCK B'S COUNT REGISTER WITH 252 PATTERN

                                        ;*
                                        ;*CLOCK B COUNT REGISTER BIT EXERCISE. ON FAILURE-SUSPECT INDIVIDUAL
                                        ;*F/FS OR GATES
                                        ;*
                                        ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 OCCURANCES PER PASS
                                        ;*
                                        ;*

                                        ;;*******************************************************************
011112  000004                          TST71:  SCOPE

                                                                        ;SELECT MODE 0.
011114  005037  001124                          CLR     $GDDAT

                                        ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
                                                                        ;LOAD THE BUFFER REGISTER WITH
                                                                        ;PATTERN 252. IT WILL BE
                                                                        ;TRANSFERRED TO THE COUNT REGISTER
                                                                        ;SINCE THIS IS MODE 0.

011130  012737  000252  001124                  MOV     #252,$GDDAT     ;SET EXPECTED TO PATTERN IN CASE OF

                                        ;*      MOV     $GDDAT,@BBR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
                                                                        ;NEED OF ERROR TYPEOUT.
                                                                        ;READ THE COUNT REGISTER

                                        ;*      MOV     @BCR,$BDDAT     ;/READ DEVICE REG BCR,PUT DATA IN $BDDAT.

011156  023737  001124  001126                  CMP     $GDDAT,$BDDAT   ;DID ALL THE BITS AND NO OTHER BITS
                                                                        ;COME THROUGH?
011164  001401                                  BEQ     1$              ;BR IF YES TO NEXT TEST.


                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

011166  104007                                  ERROR   7               ;DATA ERROR CLOCK B - PATTERN "252"
                                                                        ;FAILED TO TRANSFER PROPERLY BETWEEN
                                                                        ;BUFFER AND COUNT REGISTERS.


                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

011170                                  1$:


                                        ;;*******************************************************************
                                        ;*TEST 72        *TEST THE SETTING OF MAINTENANCE STP1 IN CLOCK A BIT 15 TO SET
                                        ;*
                                        ;*NEW SIGNALS   GENERATION OF "STP1" BY "LD STAT A" H + "BD 12" H
                                        ;*
                                        ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 PER PASS
```

```
                                  ;*
                                  ;*
                                  ;;*************************************************************
 011170  000004                   TST72:  SCOPE

 011172  005037  001124                   CLR     $GDDAT

                                  ;*      MOV     $GDDAT,@ASR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR

                                  ;*      MOV     @ASR,$GDDAT       ;/READ DEVICE REG ASR,PUT DATA IN $GDDAT.
                                                                    ;MAKE SURE THE STATUS REGISTER IS CLEAR.
                                                                    ;SET MAINTENANCE STP1.
 011216  012737  010000  001124           MOV     #BIT12,$GDDAT

                                  ;*      MOV     $GDDAT,@ASR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR

                                                                    ;DID BIT15 (STP1 FLAG) SET?

                                  ;*      MOV     @ASR,$BDDAT       ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
 011244  005737  001126                   TST     $BDDAT
 011250  100401                           BMI     1$                ;BR IF YES - NEXT TEST


         ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 011252  104001                           ERROR   1                 ;ERROR - MAINTENANCE STP1 (BIT12)
                                                                    ;DID NOT SET BIT15 (STP1 FLAG) CLOCK A.


         ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 011254                           1$:



                                  ;;*************************************************************
                                  ;*TEST 73        *TEST THAT BIT00 IN CLOCK A STATUS REG. WILL SET WHEN BIT13 AND MAIN. ST
                                  ;*
                                  ;*NEW SIGNALS    "STP1" H + "ST1 ENB CNTR (1)" H DIRECT SETTING
                                  ;*               "ST1 FLAG"
                                  ;*
                                  ;* PROBABLE SYNC POINT FOR THIS TEST:: "DEVICE OUT" 2 PER PASS
                                  ;*
                                  ;*
                                  ;;*************************************************************
 011254  000004                   TST73:  SCOPE

                                                                    ;SET "ST1 ENB COUNTER" IN CLK A'S STATUS REG.
                                                                    ;GENERATE A MAINTENANCE ST1.
                                                                    ;DID BIT00 (ENABL CNTR A) SET?
 011256  012737  020000  001124           MOV     #BIT13,$GDDAT

                                  ;*      MOV     $GDDAT,@ASR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR

                                  ;*      MOV     @ASR,$GDDAT       ;/READ DEVICE REG ASR,PUT DATA IN $GDDAT.
 011304  052737  010000  001124           BIS     #BIT12,$GDDAT
```

```
                                   ;*      MOV     $GDDAT,@ASR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR

                                   ;*      MOV     @ASR,$BDDAT      ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
011332  032737  000001  001126             BIT     #BIT00,$BDDAT
011340  001001                             BNE     1$               ;BR IF YES - NEXT TEST.


                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

011342  104001                             ERROR   1                ;ERROR - BIT00 OF CLOCK A'S STATUS REGISTER
                                                                    ;FAILED TO SET WHEN BIT13 WAS SET
                                                                    ;AND A MAINTENANCE ST1 GENERATED.


                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

011344                             1$:                              ;LEAVE SUBTEST WITH CLOCK CLEAR.
011344  005037  001124                     CLR     $GDDAT

                                   ;*      MOV     $GDDAT,@ASR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR



                                   ;;*************************************************************
                                   ;*TEST 74       *TEST THAT CLOCK A WILL INCREMENT - MODE 0 - RATE STP1 FIRST COUNT TEST
                                   ;*
                                   ;*COUNT TEST - THIS IS THE VERY FIST TIME THAT THE COUNTER
                                   ;*HAS BEEN ASKED TO INCREMENT! WHAT WE ARE GOING TO DO IS
                                   ;*CLEAR THE BUFFER, SELECT MODE 0, RATE OF STP1.
                                   ;*NEXT WILL GENERATE THE STP1 THROUGH MAINTENANCE MODE (WE'VE
                                   ;*DONE THIS BEFORE IN A PREVIOUS TEST TO SEE IF THE FLAG WOULD SET)
                                   ;*AND SEE IF THE COUNTER HAS INCREMENTED.
                                   ;*
                                   ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD BUFF A"
                                   ;*
                                   ;*
                                   ;;*************************************************************
011360  000004                     TST74:  SCOPE

                                                                    ;CLEAR CLOCK A.
                                                                    ;CLEAR BUFFER REGISTER.
011362  005037  001124                     CLR     $GDDAT

                                   ;*      MOV     $GDDAT,@ASR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR

                                   ;*      MOV     $GDDAT,@ABR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
                                                                    ;SELECT: MODE0! RATE "STP1" AND ENABLE
                                                                    ;CLOCK A TO COUNT.
                                                                    ;NOW GENERATE A MAINTENANCE STP1 - AT
                                                                    ;THIS TIME THE CLOCK SHOULD COUNT ONCE.
011406  012737  000015  001124             MOV     #15,$GDDAT

                                   ;*      MOV     $GDDAT,@ASR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR

                                   ;*      MOV     @ASR,$GDDAT      ;/READ DEVICE REG ASR,PUT DATA IN $GDDAT.
011434  052737  010000  001124             BIS     #BIT12,$GDDAT
```

```
                                        ;*      MOV     $GDDAT,@ASR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
        011452  012737  000001  001124          MOV     #1,$GDDAT         ;FOR ERROR TYPEOUT (IF NEEDED) SET THE #1.
                                                                          ;READ THE COUNT REGISTER - SHOULD=1.

                                        ;*      MOV     @ACR,$BDDAT       ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
        011470  023737  001126  001124          CMP     $BDDAT,$GDDAT     ;DID THE COUNTER COUNT ONCE?
        011476  001401                          BEQ     1$                ;IF YES - BR NEXT TEST.


                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$

        011500  104011                          ERROR   11                        ;ERROR - COUNT A FAILED TO COUNT
                                                                                  ;ONCE, WHEN ENABLED, MODE 0
                                                                                  ;RATE ''STP1'' SEE ABOVE COMMENTS
                                                                                  ;FOR COMPLETE DESCRIPTION AND LIST
                                                                                  ;OF EVENTS.


                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$

        011502                          1$:



                                        ;;*************************************************************
                                        ;*TEST 75        *TEST THE ABILITY OF CLOCK A TO COUNT FROM ZERO TO OVERFLOW USING M STP1
                                        ;*
                                        ;*IN THIS TEST WE'LL COUNT THE COUNTER THROUGH EACH STEP
                                        ;*FROM ZERO TO OVERFLOW USING MAINTENANCE ''STP1'' COUNTS.
                                        ;*IT IS KNOWN THAT THE COUNTER WILL INCREMENT ONCE USING
                                        ;*THE MAINTENANCE STP1 AND THAT THE COUNTER F/FS WILL
                                        ;*PASS ALL DATA BITS.
                                        ;*UNKNOW IS THE ABILITY OF THE F/F'S TO PROPAGATE THEIR
                                        ;*OVERFLOWS.
                                        ;*
                                        ;*IF IT IS DESIRED TO START THIS TEST AT A VALUE OTHER THAN
                                        ;*ZERO, CHANGE THE SECOND INSTR. OF THIS TEST TO A VALUE TO BE
                                        ;*LOADED INTO THE BUFFER TO THAT VALUE DESIRED.
                                        ;*
                                        ;* PROBABLE SYNC POINT FOR THIS TEST:: ''LD BUFF A''
                                        ;*
                                        ;*
                                        ;;*************************************************************
        011502  000004                  TST75:  SCOPE

        011504  005037  001124                  CLR     $GDDAT  ;START THE COUNTER FROM ZERO.
                                                                        ;NOTE: A VALUE OTHER THAN ZERO MAY BE
                                                                        ;PATCHED IN HERE IN ORDER THAT A COUNT
                                                                        ;MAY BE STARTED HIGHER.
        011510                          1$:                             ;DISABLE CLOCK A.
        011510  005037  001354                  CLR     $TMDAT

                                        ;*      MOV     $TMDAT,@ASR       ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR

                                        ;*      MOV     $GDDAT,@ABR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
                                                                          ;LOAD THE COUNTER BUFFER WITH VALUE.
                                                                          ;''1$'' IS THE LOOP BACK POINT ON
                                                                        ;"LOOP ON TEST" (SW14=1) FEATURE. NOWMAL
                                                                        ;LOOP BACK POINT WILL BE "2$".

      011534  012737  000015  001354              MOV     #15,$TMDAT
                                                                        
 (1)                                      ;*      MOV     $TMDAT,@ASR   ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
                                                                        ;ENABLE COUNTER TO COUNT. SELECTED:
                                                                        ;MODE 0, RATE "STP1"
      011552                              2$:
 (1)
 (1)                                      ;*      MOV     @ASR,$TMDAT   ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
      011562  052737  010000  001354              BIS     #BIT12,$TMDAT ;GENERATE A MAINTENANCE "STP1". THIS

 (1)                                      ;*      MOV     $TMDAT,@ASR   ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
                                                                        ;ONE VALUE.
      011600  005237  001124                      INC     $GDDAT        ;$GDDAT IS USED TO KEEP TRACK OF THE
                                                                        ;VALUE THE CLOCK SHOULD COUNT TO.


 (1)                                      ;*      MOV     @ACR,$BDDAT   ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.

      011614  023737  001126  001124              CMP     $BDDAT,$GDDAT ;DID COUNT OCCUR CORRECTLY?
      011622  001402                              BEQ     3$            ;IF YES - BR TO "3$".


              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

      011624  104011                              ERROR   11            ;ERROR - CLOCK A FAILED TO UPCOUNT
                                                                        ;CORRECTLY USING MODE 0 - RATE "STP1".


              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

      011626  000403                              BR      4$
      011630  005737  001124              3$:     TST     $GDDAT        ;DID WE ACHIEVE OVERFLOW TO ZERO YET?
      011634  001410                              BEQ     5$            ;IF YES - BR NEXT TEST

      011636  032777  040000  167274      4$:     BIT     #BIT14,@SWR   ;LOOP CURRENT COUNT?
      011644  001742                              BEQ     2$            ;BR IF NO TO NEXT COUNT UPDATE.
      011646  162737  000001  001124              SUB     #1,$GDDAT     ;IF YES - DECREMENT EXPECTED AND RELOAD.
      011654  000715                              BR      1$            ;GOTO RELOAD POINT.

      011656                              5$:                           ;END SUBTEST

                                          .SBTTL  *
                                          .SBTTL  * PHASE 3 CLOCK A COUNT FUNCTION TESTS
                                          .SBTTL  *


                                          ;;*****************************************************************
 (3)                                      ;*TEST 76        *TEST THAT CLOCK A OVERFLOW WILL OCCUR
 (4)                                      ;*
 (4)                                      ;*NOW WE'LL TRY AND GENERATE "A OVERFLOW L"
 (4)                                      ;*WHICH SETS BD05. WE'LL DO IT BY PRESETTING THE BUFFER
 (4)                                      ;*AT 177777 AND GENERATE A MAINTENANCE STP1. WE ALREADY
 (4)                                      ;*KNOW MAINTENANCE STP1'S WILL ADVANCE THE COUNTER.
```

```
                                    ;*ALSO SEE IF "MODE" FLG GETS SET.
                                    ;*
                                    ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD BUFF A"
                                    ;*
                                    ;;****************************************************************
011656  000004                      TST76:  SCOPE

                                                                    ;MAKE SURE CLOCK A CLEAR.
011660  005037  001124                      CLR     $GDDAT

                                    ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
011674  012737  177777  001124              MOV     #177777,$GDDAT  ;PRESET BUFFER TO ALL ONES.

                                    ;*      MOV     $GDDAT,@ABR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
                                                                    ;SELECT MODE 0; RATE STP4; GO.
                                                                    ;GENERATE A MAINTENANCE STP1.
011712  012737  000015  001124              MOV     #15,$GDDAT

                                    ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR

                                    ;*      MOV     @ASR,$GDDAT     ;/READ DEVICE REG ASR,PUT DATA IN $GDDAT.
011740  052737  010000  001124              BIS     #BIT12,$GDDAT

                                    ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR

011756                              1$:                             ;DID OVERFLOW BIT SET?

                                    ;*      MOV     @ASR,$BDDAT     ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
011766  032737  000040  001126              BIT     #BIT05,$BDDAT
011774  001002                              BNE     2$              ;BR IF YES TO "2$".

                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

011776  104012                              ERROR   12              ;ERROR BIT05 OF CSR CLOCK A FAILED
                                                                    ;TO SET ON OVERFLOW.

                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

012000  000411                              BR      3$

012002                              2$:                             ;DID BIT07 - "MODE" FLG SET?

                                    ;*      MOV     @ASR,$BDDAT     ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
012012  032737  000200  001126              BIT     #BIT07,$BDDAT
                                                                    ;IT SHOULD SET WHEN BIT05 SETS.
012020  001001                              BNE     3$              ;BR IF YES TO 3$.

                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

012022  104012                              ERROR   12              ;OVERFLOW FAILED TO SET CLOCK A'S
                                                                    ;CSR BIT07 "MODE" FLG. IT
                                                                    ;HAD; HOWEVER SET BIT05 "OVERFLOW"
                                                                    ;FLAG.

                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$
```

```
012024                                3$:
                                      ;;**********************************************************************
                                      ;*TEST 77        *TEST IN CLOCK A THAT OVERFLOW IN MODE 0 CAUSE CLEARING OF ''ENB CNTR'' F/
                                      ;*
                                      ;*WE'RE GOING TO SEE IF ''A RELOAD'' H AND ''MODE 0'' H CLEAR
                                      ;*''ENB CNTR A'' F/F.  ''A RELOAD'' GENERATED ON OVERFLOW AND
                                      ;*''MODE 0'' GENERATED BY ''MODE A0 (0)'' AND ''MODE A0 (1)''
                                      ;*ALSO SEE IF COUNTER REGISTER GETS RELOADED
                                      ;*
                                      ;* PROBABLE SYNC POINT FOR THIS TEST:: ''LD BUFF A''
                                      ;*
                                      ;*
                                      ;;**********************************************************************
012024  000004                        TST77:  SCOPE

                                                                        ;MAKE SURE CLOCK A IS CLEAR.
012026  005037  001124                        CLR     $GDDAT

                                      ;*      MOV     $GDDAT,@ASR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
                                                                        ;PRESET BUFFER TO ALL ONES.
                                                                        ;SELECT MODE 0, RATE ''STP4''; GO.
                                                                        ;GENERATE A MAINTENANCE STP1.
                                                                        ;THIS SHOULD CAUSE AN OVERFLOW
                                                                        ;OVERFLOW WILL GENERATE ''A RELOAD'' H
                                                                        ;COMBINE THIS WITH MODE 0 AND WE
012042  012737  177777  001124                MOV     #177777,$GDDAT

                                      ;*      MOV     $GDDAT,@ABR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
012060  012737  000015  001124                MOV     #15,$GDDAT

                                      ;*      MOV     $GDDAT,@ASR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR

                                      ;*      MOV     @ASR,$GDDAT       ;/READ DEVICE REG ASR,PUT DATA IN $GDDAT.
012106  052737  010000  001124                BIS     #BIT12,$GDDAT

                                      ;*      MOV     $GDDAT,@ASR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
                                                                        ;SHOULD CLEAR ''ENB CNTR A'' F/F.


                                      ;*      MOV     @ASR,$TMDAT       ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
012134  032737  000001  001354                BIT     #BIT00,$TMDAT     ;DID BIT00 ''ENB CNTR A'' F/F CLEAR?
012142  001402                                BEQ     1$                ;BR IF YES - NEXT TEST.

                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

012144  104012                                ERROR   12                ;''ENB CNTR A'' F/F NOT CLEARED
                                                                        ;ON OVERFLOW.

                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

012146  000411                                BR      2$

012150                                1$:

                                      ;*      MOV     @ACR,$BDDAT       ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
012160  022737  177777  001126                CMP     #177777,$BDDAT    ;DID COUNTER GET RELOADED AFTER
```

```
2221                                                            ;THE OVERFLOW OCCURRED?
2222  012166  001401                    BEQ     2$              ;BR IF YES - NEXT TEST.
2223
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

2224  012170  104012                    ERROR   12              ;ERROR CLOCK A - COUNTER DID NOT GET RELOAD FROM
2225                                                            ;BUFFER AFTER OVERFLOW. "A RELOAD" H
2226                                                            ;DID GET GENERATED ON WE WOULD
2227                                                            ;HAVE GOT PREVIOUS ERROR; THEREFORE PROBLEM
2228                                                            ;MUST EXIST WITH COMBINING "A RELOAD" H
2229                                                            ;WITH "MODE A1 (0)" H TO GENERATE A
2230                                                            ;COUNTER LOAD.
2231
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

2232  012172                    2$:
2280
```

```
 2281                                          ;/#
  (1)
  (5)                                  ;;*************************************************************
  (4)                                  ;*TEST 100       *TEST THE ABILITY OF CLOCK A TO COUNT AT 1MHZ RATE PART 1
  (5)                                  ;*
  (5)                                  ;*THIS TEST IS DESIGNED TO TEST CLOCK A'S ABILITY TO COUNT
  (5)                                  ;*IN RATE: 1MHZ         PART 1
  (6)                                  ;*
  (6)                                  ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD BUFF A"
  (6)                                  ;*
  (5)                                  ;*
  (4)                                  ;;*************************************************************
  (3)  012172  000004                  TST100: SCOPE
  (1)
  (1)                                                                 ;/MAKE SURE CLOCK IS CLEAR.
  (1)                                                                 ;/CLEAR THE BUFFER.
  (1)                                                                 ;/SELECT: MODE 0, RATE 1MHZ ; GO.
  (1)  012174  005037  001124                  CLR     $GDDAT
  (2)
  (2)                                  ;*      MOV     $GDDAT,@ASR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
  (2)
  (2)                                  ;*      MOV     $GDDAT,@ABR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
  (1)  012220  012737  000003  001124          MOV     #1!2,$GDDAT
  (2)
  (2)                                  ;*      MOV     $GDDAT,@ASR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
  (1)  012236  005000                          CLR     R0               ;/NOW WE'LL DO A LITTLE DELAY: THIS DELAY
  (1)  012240  005200                  1$:     INC     R0               ;/WILL AMOUNT TO 369MS ON A PDP-11/20
  (1)  012242  001376                          BNE     1$
  (1)                                                                 ;/DID COUNTER INCREMENT AT ALL?
  (2)
  (2)                                  ;*      MOV     @ACR,$BDDAT      ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
  (1)  012254  005737  001126                  TST     $BDDAT
  (1)  012260  001011                          BNE     2$               ;/IF YES - BR NEXT TEST.
  (1)
  (1)                                                                 ;/COUNTER MAY HAVE HAD TIME TO OVERFLOW.
  (2)
  (2)                                  ;*      MOV     @ASR,$BDDAT      ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
  (1)  012272  032737  000040  001126          BIT     #BIT05,$BDDAT
  (1)                                                                 ;/AT HIGH RATE - SO WE'LL SEE IF "OVERFLOW"
  (1)                                                                 ;/F/F HAD SET.
  (1)  012300  001001                          BNE     2$               ;/BR IF YES NEXT TEST.
  (2)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (1)  012302  104012                          ERROR   12               ;/ERROR CLOCK A COUNTER FAILED TO
  (1)                                                                 ;/COUNT RATE: 1MHZ.
  (2)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (1)  012304                          2$:
```

```
 2282                                          ;/#
  (1)
  (5)                                         ;;*****************************************************************
  (4)                                         ;*TEST 101        *TEST THE ABILITY OF CLOCK A TO COUNT AT 100KHZ RATE PART 1
  (5)                                         ;*
  (5)                                         ;*THIS TEST IS DESIGNED TO TEST CLOCK A'S ABILITY TO COUNT
  (5)                                         ;*IN RATE: 100KHZ                PART 1
  (6)                                         ;*
  (6)                                         ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD BUFF A"
  (6)                                         ;*
  (5)                                         ;*
  (4)                                         ;;*****************************************************************
  (3)  012304  000004                         TST101: SCOPE
  (1)
  (1)                                                                            ;/MAKE SURE CLOCK IS CLEAR.
  (1)                                                                            ;/CLEAR THE BUFFER.
  (1)                                                                            ;/SELECT: MODE 0, RATE 100KHZ ; GO.
  (1)  012306  005037  001124                         CLR     $GDDAT
  (2)
  (2)                                         ;*      MOV     $GDDAT,@ASR        ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
  (2)
  (2)                                         ;*      MOV     $GDDAT,@ABR        ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
  (1)  012332  012737  000005  001124                 MOV     #1!4,$GDDAT
  (2)
  (2)                                         ;*      MOV     $GDDAT,@ASR        ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
  (1)  012350  005000                                 CLR     R0                 ;/NOW WE'LL DO A LITTLE DELAY: THIS DELAY
  (1)  012352  005200                         1$:     INC     R0                 ;/WILL AMOUNT TO 369MS ON A PDP-11/20
  (1)  012354  001376                                 BNE     1$
  (1)                                                                            ;/DID COUNTER INCREMENT AT ALL?
  (2)
  (2)                                         ;*      MOV     @ACR,$BDDAT        ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
  (1)  012366  005737  001126                         TST     $BDDAT
  (1)  012372  001011                                 BNE     2$                 ;/IF YES - BR NEXT TEST.
  (1)
  (1)                                                                            ;/COUNTER MAY HAVE HAD TIME TO OVERFLOW.
  (2)
  (2)                                         ;*      MOV     @ASR,$BDDAT        ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
  (1)  012404  032737  000040  001126                 BIT     #BIT05,$BDDAT
  (1)                                                                            ;/AT HIGH RATE - SO WE'LL SEE IF "OVERFLOW"
  (1)                                                                            ;/F/F HAD SET.
  (1)  012412  001001                                 BNE     2$                 ;/BR IF YES NEXT TEST.
  (2)
                 ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (1)  012414  104012                                 ERROR   12                 ;/ERROR CLOCK A COUNTER FAILED TO
  (1)                                                                            ;/COUNT RATE: 100KHZ.
  (2)
                 ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (1)  012416                                 2$:
```

```
                                                  ;/#
 (1)
 (5)                                   ;;*********************************************************************
 (4)                                   ;*TEST 102       *TEST THE ABILITY OF CLOCK A TO COUNT AT 10KHZ RATE PART 1
 (5)                                   ;*
 (5)                                   ;*THIS TEST IS DESIGNED TO TEST CLOCK A'S ABILITY TO COUNT
 (5)                                   ;*IN RATE: 10KHZ                    PART 1
 (6)                                   ;*
 (6)                                   ;* PROBABLE SYNC POINT FOR THIS TEST:: ''LD BUFF A''
 (6)                                   ;*
 (5)                                   ;*
 (4)                                   ;;*********************************************************************
 (3)  012416  000004                   TST102: SCOPE
 (1)
 (1)                                                                     ;/MAKE SURE CLOCK IS CLEAR.
 (1)                                                                     ;/CLEAR THE BUFFER.
 (1)                                                                     ;/SELECT: MODE 0, RATE 10KHZ ; GO.
 (1)  012420  005037  001124                   CLR     $GDDAT
 (2)
 (2)                                   ;*      MOV     $GDDAT,@ASR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
 (2)
 (2)                                   ;*      MOV     $GDDAT,@ABR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
 (1)  012444  012737  000007  001124           MOV     #1!6,$GDDAT
 (2)
 (2)                                   ;*      MOV     $GDDAT,@ASR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
 (1)  012462  005000                           CLR     R0                ;/NOW WE'LL DO A LITTLE DELAY: THIS DELAY
 (1)  012464  005200                   1$:     INC     R0                ;/WILL AMOUNT TO 369MS ON A PDP-11/20
 (1)  012466  001376                           BNE     1$
 (1)                                                                     ;/DID COUNTER INCREMENT AT ALL?
 (2)
 (2)                                   ;*      MOV     @ACR,$BDDAT       ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
 (1)  012500  005737  001126                   TST     $BDDAT
 (1)  012504  001011                           BNE     2$                ;/IF YES - BR NEXT TEST.
 (1)
 (1)                                                                     ;/COUNTER MAY HAVE HAD TIME TO OVERFLOW.
 (2)
 (2)                                   ;*      MOV     @ASR,$BDDAT       ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
 (1)  012516  032737  000040  001126           BIT     #BIT05,$BDDAT
 (1)                                                                     ;/AT HIGH RATE - SO WE'LL SEE IF ''OVERFLOW''
 (1)                                                                     ;/F/F HAD SET.
 (1)  012524  001001                           BNE     2$                ;/BR IF YES NEXT TEST.
 (2)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

 (1)  012526  104012                           ERROR   12                ;/ERROR CLOCK A COUNTER FAILED TO
 (1)                                                                     ;/COUNT RATE: 10KHZ.
 (2)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

 (1)  012530                           2$:
```

```
 2284                                         ;/#
  (1)
  (5)                                 ;;*************************************************************
  (4)                                 ;*TEST 103       *TEST THE ABILITY OF CLOCK A TO COUNT AT 1KHZ RATE PART 1
  (5)                                 ;*
  (5)                                 ;*THIS TEST IS DESIGNED TO TEST CLOCK A'S ABILITY TO COUNT
  (5)                                 ;*IN RATE: 1KHZ          PART 1
  (6)                                 ;*
  (6)                                 ;* PROBABLE SYNC POINT FOR THIS TEST:: ''LD BUFF A''
  (6)                                 ;*
  (5)                                 ;*
  (4)                                 ;;*************************************************************
  (3)  012530  000004                 TST103: SCOPE
  (1)
  (1)                                                                 ;/MAKE SURE CLOCK IS CLEAR.
  (1)                                                                 ;/CLEAR THE BUFFER.
  (1)                                                                 ;/SELECT: MODE 0, RATE 1KHZ ; GO.
  (1)  012532  005037  001124                 CLR     $GDDAT
  (2)
  (2)                                 ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
  (2)
  (2)                                 ;*      MOV     $GDDAT,@ABR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
  (1)  012556  012737  000011  001124         MOV     #1!10,$GDDAT
  (2)
  (2)                                 ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
  (1)  012574  005000                         CLR     R0              ;/NOW WE'LL DO A LITTLE DELAY: THIS DELAY
  (1)  012576  005200                 1$:     INC     R0              ;/WILL AMOUNT TO 369MS ON A PDP-11/20
  (1)  012600  001376                         BNE     1$
  (1)                                                                 ;/DID COUNTER INCREMENT AT ALL?
  (2)
  (2)                                 ;*      MOV     @ACR,$BDDAT     ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
  (1)  012612  005737  001126                 TST     $BDDAT
  (1)  012616  001011                         BNE     2$              ;/IF YES - BR NEXT TEST.
  (1)
  (1)                                                                 ;/COUNTER MAY HAVE HAD TIME TO OVERFLOW.
  (2)
  (2)                                 ;*      MOV     @ASR,$BDDAT     ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
  (1)  012630  032737  000040  001126         BIT     #BIT05,$BDDAT
  (1)                                                                 ;/AT HIGH RATE - SO WE'LL SEE IF ''OVERFLOW''
  (1)                                                                 ;/F/F HAD SET.
  (1)  012636  001001                         BNE     2$              ;/BR IF YES NEXT TEST.
  (2)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (1)  012640  104012                         ERROR   12              ;/ERROR CLOCK A COUNTER FAILED TO
  (1)                                                                 ;/COUNT RATE: 1KHZ.
  (2)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (1)  012642                         2$:
```

```
                                                ;/#
 (1)
 (5)                                    ;;*************************************************************
 (4)                                    ;*TEST 104       *TEST THE ABILITY OF CLOCK A TO COUNT AT 100HZ RATE PART 1
 (5)                                    ;*
 (5)                                    ;*THIS TEST IS DESIGNED TO TEST CLOCK A'S ABILITY TO COUNT
 (5)                                    ;*IN RATE: 100HZ                 PART 1
 (6)                                    ;*
 (6)                                    ;* PROBABLE SYNC POINT FOR THIS TEST:: ''LD BUFF A''
 (6)                                    ;*
 (5)                                    ;*
 (4)                                    ;;*************************************************************
 (3)  012642  000004                    TST104: SCOPE
 (1)
 (1)                                                                  ;/MAKE SURE CLOCK IS CLEAR.
 (1)                                                                  ;/CLEAR THE BUFFER.
 (1)                                                                  ;/SELECT: MODE 0, RATE 100HZ ; GO.
 (1)  012644  005037  001124                    CLR     $GDDAT
 (2)
 (2)                                    ;*      MOV     $GDDAT,@ASR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
 (2)
 (2)                                    ;*      MOV     $GDDAT,@ABR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
 (1)  012670  012737  000013  001124            MOV     #1!12,$GDDAT
 (2)
 (2)                                    ;*      MOV     $GDDAT,@ASR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
 (1)  012706  005000                            CLR     R0               ;/NOW WE'LL DO A LITTLE DELAY: THIS DELAY
 (1)  012710  005200                    1$:     INC     R0               ;/WILL AMOUNT TO 369MS ON A PDP-11/20
 (1)  012712  001376                            BNE     1$
 (1)                                                                     ;/DID COUNTER INCREMENT AT ALL?
 (2)
 (2)                                    ;*      MOV     @ACR,$BDDAT      ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
 (1)  012724  005737  001126                    TST     $BDDAT
 (1)  012730  001011                            BNE     2$               ;/IF YES - BR NEXT TEST.
 (1)
 (1)                                                                     ;/COUNTER MAY HAVE HAD TIME TO OVERFLOW.
 (2)
 (2)                                    ;*      MOV     @ASR,$BDDAT      ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
 (1)  012742  032737  000040  001126            BIT     #BIT05,$BDDAT
 (1)                                                                     ;/AT HIGH RATE - SO WE'LL SEE IF ''OVERFLOW''
 (1)                                                                     ;/F/F HAD SET.
 (1)  012750  001001                            BNE     2$               ;/BR IF YES NEXT TEST.
 (2)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

 (1)  012752  104012                            ERROR   12               ;/ERROR CLOCK A COUNTER FAILED TO
 (1)                                                                     ;/COUNT RATE: 100HZ.
 (2)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

 (1)  012754                            2$:
```

```
2286                                          ;/#
 (1)
 (5)                                          ;;*************************************************************
 (4)                                          ;*TEST 105        *TEST THE ABILITY OF CLOCK A TO COUNT AT LINE-FREQ RATE PART 1
 (5)                                          ;*
 (5)                                          ;*THIS TEST IS DESIGNED TO TEST CLOCK A'S ABILITY TO COUNT
 (5)                                          ;*IN RATE: LINE-FREQ             PART 1
 (6)                                          ;*
 (6)                                          ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD BUFF A"
 (6)                                          ;*
 (5)                                          ;*
 (4)                                          ;;*************************************************************
 (3)  012754  000004                          TST105: SCOPE
 (1)
 (1)                                                                          ;/MAKE SURE CLOCK IS CLEAR.
 (1)                                                                          ;/CLEAR THE BUFFER.
 (1)                                                                          ;/SELECT: MODE 0, RATE LINE-FREQ ; GO.
 (1)  012756  005037  001124                           CLR     $GDDAT
 (2)
 (2)                                          ;*       MOV     $GDDAT,@ASR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
 (2)
 (2)                                          ;*       MOV     $GDDAT,@ABR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
 (1)  013002  012737  000017  001124                   MOV     #1!16,$GDDAT
 (2)
 (2)                                          ;*       MOV     $GDDAT,@ASR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
 (1)  013020  005000                                   CLR     R0               ;/NOW WE'LL DO A LITTLE DELAY: THIS DELAY
 (1)  013022  005200                          1$:      INC     R0               ;/WILL AMOUNT TO 369MS ON A PDP-11/20
 (1)  013024  001376                                   BNE     1$
 (1)                                                                          ;/DID COUNTER INCREMENT AT ALL?
 (2)
 (2)                                          ;*       MOV     @ACR,$BDDAT      ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
 (1)  013036  005737  001126                           TST     $BDDAT
 (1)  013042  001011                                   BNE     2$               ;/IF YES - BR NEXT TEST.
 (1)
 (1)                                                                          ;/COUNTER MAY HAVE HAD TIME TO OVERFLOW.
 (2)
 (2)                                          ;*       MOV     @ASR,$BDDAT      ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
 (1)  013054  032737  000040  001126                   BIT     #BIT05,$BDDAT
 (1)                                                                          ;/AT HIGH RATE - SO WE'LL SEE IF "OVERFLOW"
 (1)                                                                          ;/F/F HAD SET.
 (1)  013062  001001                                   BNE     2$               ;/BR IF YES NEXT TEST.
 (2)
                  ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

 (1)  013064  104012                                   ERROR   12               ;/ERROR CLOCK A COUNTER FAILED TO
 (1)                                                                          ;/COUNT RATE: LINE-FREQ.
 (2)
                  ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

 (1)  013066                                  2$:
2287
2296
2297                                          ;;*************************************************************
 (3)                                          ;*TEST 106        *TEST THAT CLOCK A DOESN'T COUNT WHEN NO RATE IS SELECTED
 (4)                                          ;*
 (4)                                          ;*WE KNOW THAT CLOCK A COUNTS AT ALL
```

```
   (4)                                  ;*ITS RATES, SO LETS BE SURE IT DOESNT
   (4)                                  ;*COUNT WHEN NO RATE IS SELECTED. ON
   (4)                                  ;*ERROR SUSPECT DUAL RATE SELECTION.
   (5)                                  ;*
   (5)                                  ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD BUFF A"
   (5)                                  ;*
   (3)                                  ;;*************************************************************
   (2) 013066  000004                   TST106: SCOPE
  2298
  2299                                                                 ;CLEAR CLOCK A.
  2300                                                                 ;ZERO ITS BUFFER.
  2301                                                                 ;TELL THE CLOCK TO GO!
  2302 013070  005037  001124                   CLR     $GDDAT
  2303
   (1)                                  ;*      MOV     $GDDAT,@ASR    ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
  2304
   (1)                                  ;*      MOV     $GDDAT,@ABR    ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
  2305 013114  005237  001124                   INC     $GDDAT
  2306
   (1)                                  ;*      MOV     $GDDAT,@ASR    ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
  2307                                                                 ;NO RATE SELECTED.
  2308 013130  005000                           CLR     R0
  2309 013132  005200                   1$:     INC     R0
  2310 013134  001376                           BNE     1$
  2311                                                                 ;ANY COUNT OCCUR?
  2312
   (1)                                  ;*      MOV     @ACR,$BDDAT    ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
  2313 013146  005737  001126                   TST     $BDDAT
  2314 013152  001010                           BNE     2$             ;IF COUNTER HAS SOMETHING IN IT REPORT ERROR
  2315
  2316
   (1)                                  ;*      MOV     @ASR,$BDDAT    ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
  2317 013164  032737  000040  001126           BIT     #BIT05,$BDDAT  ;IF THE OVERFLOW BIT SET THEN IT MUST
  2318                                                                 ;HAVE COUNTED.
  2319 013172  001401                           BEQ     3$
  2320
  2321
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

  2322 013174  104012                   2$:     ERROR   12             ;AH HA! ERROR CLOCK A COUNTED WHEN
  2323                                                                 ;ENABLED-BUT-NO-RATE SELECTED
  2324                                                                 ;BETTER FIND OUT HOW CAUSED SIGNAL:
  2325                                                                 ;"CLOCK A" L.
  2326
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

  2327 013176                           3$:
  2328
  2338
  2339                                  ;;*************************************************************
   (3)                                  ;*TEST 107      *TEST THAT CLOCK A'S COUNT REG ISN'T LOADED WHEN CLOCK A IS ENABLED
   (4)                                  ;*
   (4)                                  ;*IN THIS TEST WE'LL FIND OUT IF F/F "ENB CNTR A" WHEN SET,
   (4)                                  ;*INHIBITS LOADING OF CLOCK A'S COUNT REGISTER
   (4)                                  ;*THE LOADING OF THE COUNT REGISTER IS A FUNCTION OF:
   (4)                                  ;*"ENB CNTR (0)" H + "BUFFER LOAD" H
```

```
                                        ;*
                                        ;*
                                        ;* PROBABLE SYNC POINT FOR THIS TEST:: "RD STAT B"
                                        ;*
                                        ;;*****************************************************************
013176  000004                          TST107: SCOPE

                                                                        ;GENERATE A SYNC PULSE
                                                                        ;CLEAR CLOCK A'S STATUS REG.
                                                                        ;CLEAR CLOCK A'S BUFFER REG. NOTE
                                                                        ;THIS WILL ALSO CAUSE ZEROS TO BE
                                                                        ;LOADED INTO THE COUNT REG.

                                        ;*      MOV     @BSR,$BDDAT     ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
013210  005737  001126                          TST     $BDDAT
013214  005037  001124                          CLR     $GDDAT

                                        ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR

                                        ;*      MOV     $GDDAT,@ABR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
013240  005237  001124                          INC     $GDDAT          ;SET THE ENABLE F/F. THIS

                                        ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
                                                                        ;FROM BEING LOADED WHEN THE
                                                                        ;BUFFER IS LOADED.
013254  012737  177777  001124                  MOV     #177777,$GDDAT  ;NOW LOAD THE BUFFER REG.

                                        ;*      MOV     $GDDAT,@ABR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
                                                                        ;TO THE COUNT REGISTER.
                                                                        ;DID ANY BITS GET TRANSFERRED TO
                                                                        ;THE COUNT REGISTER?

                                        ;*      MOV     @ACR,$BDDAT     ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
013302  005737  001126                          TST     $BDDAT
013306  001401                                  BEQ     1$              ;BR IF NO - NEXT TEST.

                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

013310  104012                                  ERROR   12              ;ERROR CLOCK A BUFFER TO COUNT REG TRANSFER
                                                                        ;OCCURRED EVEN THOUGH THE "ENB CNTR A" F/F
                                                                        ;WAS SET.

                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

013312                                  1$:


                                        ;;*****************************************************************
                                        ;*TEST 110      *TEST THAT CLOCK A IN MODE 1 DOES NOT CLEAR ENABLE ON OVERFLOW
                                        ;*
                                        ;*NOW WE'RE GOING TO SEE IF "A OVERFLOW" H WHEN GENERATED
                                        ;*BY CAUSING AN OVERFLOW DOESN'T CLEAR THE "ENB CNTR A" F/F
                                        ;*WHEN IN MODE 1. IF F/F GETS CLEARED SUSPECT SIGNAL "MODE 0" H.
                                        ;*
                                        ;*
                                        ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD BUFF A"
```

```
 (5)                                    ;*
 (3)                                    ;;************************************************************
 (2)  013312  000004                    TST110: SCOPE

                                                                  ;MAKE SURE CLOCK A IS CLEAR.
                                                                  ;SET BUFFER + COUNT REG. TO -1 FROM OVERFLOW
                                                                  ;SET: MODE 1; RATE STP1; GO.
                                                                  ;CAUSE A MAINTENANCE STP4. CLOCK 1
                                                                  ;SHOULD OVERFLOW - BUT THIS OVERFLOW SHOULD
                                                                  ;NOT CLEAR "ENB CNTR A" F/F.
                                                                  ;DID BIT00, "ENB CNTR A" F/F GET CLEARED?
      013314  005037  001124                     CLR     $GDDAT

 (1)                                    ;*       MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
      013330  012737  177777  001124             MOV     #177777,$GDDAT

 (1)                                    ;*       MOV     $GDDAT,@ABR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
      013346  012737  000415  001124             MOV     #415,$GDDAT

 (1)                                    ;*       MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR

 (1)                                    ;*       MOV     @ASR,$TMDAT     ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
      013374  052737  010000  001354             BIS     #BIT12,$TMDAT

 (1)                                    ;*       MOV     $TMDAT,@ASR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR

 (1)                                    ;*       MOV     @ASR,$BDDAT     ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
      013422  032737  000001  001126             BIT     #BIT00,$BDDAT
      013430  001001                             BNE     1$              ;BR IF NO TO NEXT TEST.

                 ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

      013432  104012                             ERROR   12              ;ERROR MODE 1 OPERATION "ENB CNTR A" F/F
                                                                         ;WAS CLEARED ON OVERFLOW.

                 ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

      013434                            1$:



                                        ;;************************************************************
 (3)                                    ;*TEST 111        *TEST THAT A CLOCK A "BUFFER TO COUNT REG" DOESN'T TAKE PLACE ON A MODE
 (4)                                    ;*
 (4)                                    ;*THIS WILL BE THE FIRST TIME WE'VE DONE A MODE 2 OPERATION
 (4)                                    ;*ON CLOCK A. THE FUNCTION OF THIS TEST WILL BE TO MAKE
 (4)                                    ;*SURE A BUFFER TO COUNT REGISTER DOESN'T TAKE PLACE ON OVERFLOW
 (4)                                    ;*THE COMBO THAT GAVE US BUFFER TO COUNT REG ON OVERFLOW BEFORE
 (4)                                    ;*IS ["MODE A1 (0)" H + "A RELOAD" H]. WE'LL STILL BE GENERATING
 (5)                                    ;*
 (5)                                    ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD BUFF A"
 (5)                                    ;*
 (4)                                    ;*"A RELOAD" H BUT SHOULD NOT GET."MODE A1 (0)" H AS THIS IS MODE 2.
 (4)                                    ;*
 (3)                                    ;;************************************************************
 (2)  013434  000004                    TST111: SCOPE
```

```
                                                                   ;MAKE SURE CLOCK A IS CLEAR.
                                                                   ;SET BUFFER + COUNT REG TO -1 FROM OVERFLOW.
                                                                   ;SET: MODE 2; RATE STP1; GO.
                                                                   ;CAUSE A MAINTENANCE STP1 - CLOCK ONCE.
                                                                   ;THIS SHOULD CAUSE AN OVERFLOW AND LEAVE
                                                                   ;THE COUNT REGISTER CLEAR AS A
                                                                   ;BUFFER TO COUNT REG. SHOULDN'T OCCUR.
                                                                   ;IS THE COUNT REG. CLEAR?
013436  005037  001124                     CLR     $GDDAT

                                   ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
013452  012737  177777  001124             MOV     #177777,$GDDAT

                                   ;*      MOV     $GDDAT,@ABR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
013470  012737  001015  001124             MOV     #1015,$GDDAT

                                   ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR

                                   ;*      MOV     @ASR,$GDDAT     ;/READ DEVICE REG ASR,PUT DATA IN $GDDAT.
013516  052737  010000  001124             BIS     #BIT12,$GDDAT

                                   ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR

                                   ;*      MOV     @ACR,$BDDAT     ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
013544  005737  001126                     TST     $BDDAT
013550  001401                             BEQ     1$              ;BR IF YES TO NEXT TEST.

        ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

013552  104012                             ERROR   12              ;ERROR THE CONTENTS OF THE BUFFER REG.
                                                                   ;GOT TRANSFERRED TO THE COUNT REG.
                                                                   ;(CLOCK A) ON OVERFLOW DOING A
                                                                   ;MODE 2 OPERATION.

                                                                   ;THERE'S AN OUTSIDE CHANCE THAT THE
                                                                   ;COUNT REG. NEVER GOES TO ZERO ON
                                                                   ;AN OVERFLOW - THIS IS THE FIRST TIME
                                                                   ;THAT WE WERE ABLE TO LOOK AT IT ON
                                                                   ;OVERFLOW BECAUSE MODES 0 + 1 CAUSED
                                                                   ;THAT AUTOMATIC BUFFER TO COUNT REG.

        ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

013554                             1$:



                                   ;;*****************************************************************
                                   ;*TEST 112      *TEST THAT CLOCK A MODE 2 + MAINTENANCE ST2 SET MODE FLG
                                   ;*
                                   ;*NOW WE'LL SEE IF CAN GENERATE A "CNTR TO BUFF" H SIGNAL.
                                   ;*TO DETECT IT, WE'RE GOING TO DEPEND ON IT SETTING THE MODE FLAG,
                                   ;*CLOCK A CSR BIT07. ["MODE A1 (0)" H + "ST2 (1)" H] + "TPO" L="CNTR TO BUFF" H.
                                   ;*BEING IN MODE 2, SHOULD GIVE US "MODE A1 (1)" H. WELL GET ST2 (1) H
                                   ;*BY GENERATING A MAINTENANCE "ST2". TPO COMES FROM THE INTERNAL
                                   ;*CLOCK PAGE.
                                   ;*
```

```
(5)                                   ;* PROBABLE SYNC POINT FOR THIS TEST:: "RD STAT B"
(5)                                   ;*
(4)                                   ;*
(3)                                   ;;*************************************************************
(2)  013554  000004                   TST112: SCOPE

                                                                        ;GENERATE A SYNC PULSE

(1)                                   ;*        MOV     @BSR,$BDDAT     ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
     013566  005737  001126                     TST     $BDDAT
                                                                        ;MAKE SURE CLOCK A'S STAT REG IS CLEAR.
     013572  005037  001124                     CLR     $GDDAT

(1)                                   ;*        MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
                                                                        ;SET MODE 2.
                                                                        ;GENERATE MAINTENANCE ST2.
                                                                        ;THE COMBO OF MODE 2 + ST2 SHOULD
                                                                        ;GET "CNTR TO BUFF" H WHICH SHOULD
                                                                        ;SET "MODE FLG" F/F.
     013606  012737  001000  001124             MOV     #1000,$GDDAT

(1)                                   ;*        MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR

(1)                                   ;*        MOV     @ASR,$GDDAT     ;/READ DEVICE REG ASR,PUT DATA IN $GDDAT.
     013634  052737  002000  001124             BIS     #BIT10,$GDDAT

(1)                                   ;*        MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
                                                                        ;DID IT SET?

(1)                                   ;*        MOV     @ASR,$BDDAT     ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
     013662  032737  000200  001126             BIT     #BIT07,$BDDAT
     013670  001001                             BNE     1$              ;IF YES-BR TO NEXT TEST.

                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

     013672  104012                             ERROR   12              ;ERROR - MODE 2 + ST2 DID NOT SET MODE FL.

                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

     013674                           1$:



(5)                                   ;;*************************************************************
(4)                                   ;*TEST 113        *TEST THAT PATTERN 052525 CAN BE XFERRED BETWEEN A'S COUNT-BUFFER REGS
(5)                                   ;*
(5)                                   ;*NOW WE'LL SHOT THE WORKS - WE KNOW FROM THE PREVIOUS TEST WE
(5)                                   ;*CAN GENERATE "CNTR TO BUFF" H FROM MODE 2 + MAINTENANCE ST2, NOW
(5)                                   ;*WE WELL TRY AND GENERATE A TRANSFER BETWEEN THE COUNTER AND BUFFER
(5)                                   ;*USING A CB PAT PATTERN.
(5)                                   ;*IF NO DATA PATTERN GETS TRANSFERRED, SUSPECT SIG "LD BUFFER"
(5)                                   ;*TO BE STUCK LOW AT THE MUX INPUT FOR THE BUFFER OR
(5)                                   ;*"CNTR TO BUFF" H NOT GETTING THROUGH TO THE LOAD INPUTS OF THE
(5)                                   ;*BUFFER REGISTER.
(5)                                   ;*IF JUST ONE OR A FEW BITS GETS MESSED UP ON THE XFERR-
(5)                                   ;*SUSPECT THE RESPECTIVE MUX OR ETCH BETWEEN THE COUNT REG
(5)                                   ;*AND MUX. GOOD LUCK.
```

```
 (6)                                     ;*
 (6)                                     ;* PROBABLE SYNC POINT FOR THIS TEST:: "RD STAT B"
 (6)                                     ;*
 (5)                                     ;*
 (4)                                     ;;*******************************************************************
 (3)  013674  000004                     TST113: SCOPE
 (1)
 (1)                                                                    ;GENERATE A SYNC PULSE
 (2)
 (2)                                     ;*      MOV     @BSR,$BDDAT    ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
 (1)  013706  005737  001126                     TST     $BDDAT
 (1)                                                                    ;MAKE SURE CLOCK A IS CLEAR.
 (1)                                                                    ;PUT PATTERN 052525 INTO BUFFER REG.
 (1)                                                                    ;IT SHOULD GET XFERRED TO COUNT REG.
 (1)                                                                    ;SELECT: MODE 2, ENABLE.
 (1)                                                                    ;NOW GENERATE A MAINTENANCE ST2.
 (1)  013712  005037  001124                     CLR     $GDDAT
 (2)
 (2)                                     ;*      MOV     $GDDAT,@ASR    ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
 (1)  013726  012737  052525  001124             MOV     #052525,$GDDAT
 (2)
 (2)                                     ;*      MOV     $GDDAT,@ABR    ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
 (1)  013744  012737  001001  001124             MOV     #1001,$GDDAT
 (2)
 (2)                                     ;*      MOV     $GDDAT,@ASR    ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
 (1)  013762  005037  001124                     CLR     $GDDAT
 (2)
 (2)                                     ;*      MOV     $GDDAT,@ABR    ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
 (2)
 (2)                                     ;*      MOV     @ASR,$GDDAT    ;/READ DEVICE REG ASR,PUT DATA IN $GDDAT.
 (1)  014006  052737  002000  001124             BIS     #BIT10,$GDDAT
 (2)
 (2)                                     ;*      MOV     $GDDAT,@ASR    ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
 (1)  014024  012737  052525  001124             MOV     #052525,$GDDAT ;RECORD $GDDAT (PATTERN) IN CASE WE
 (1)                                                                    ;NEED TO TYPE OUT AN ERROR.
 (1)                                                                    ;NOW READ BACK THE BUFFER REG.
 (2)
 (2)                                     ;*      MOV     @ABR,$BDDAT    ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
 (1)  014042  023737  001126  001124             CMP     $BDDAT,$GDDAT  ;WAS THE TRANSFER SUCCESSFUL?
 (1)  014050  001401                             BEQ     1$             ;IF YES THEN BR TO NEXT TEST.
 (2)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (1)  014052  104012                             ERROR   12             ;ERROR FAILED TO XFERR 052525 PATTERN
 (1)                                                                    ;CORRECTLY FROM COUNT TO BUFFER REG.
 (1)                                                                    ;SEE INIT. COMMENT AS TO WHY
 (1)                                                                    ;IT MIGHT HAVE GONE SOUR.
 (2)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (1)  014054                             1$:
 (1)          000011                             P=P+1
2549
 (5)                                     ;;*******************************************************************
 (4)                                     ;*TEST 114      *TEST THAT PATTERN 125252 CAN BE XFERRED BETWEEN A'S COUNT-BUFFER REGS
 (5)                                     ;*
```

```
   (5)                                              ;*NOW WE'LL SHOT THE WORKS - WE KNOW FROM THE PREVIOUS TEST WE
   (5)                                              ;*CAN GENERATE ''CNTR TO BUFF'' H FROM MODE 2 + MAINTENANCE ST2, NOW
   (5)                                              ;*WE WELL TRY AND GENERATE A TRANSFER BETWEEN THE COUNTER AND BUFFER
   (5)                                              ;*USING A CB PAT PATTERN.
   (5)                                              ;*IF NO DATA PATTERN GETS TRANSFERRED, SUSPECT SIG ''LD BUFFER''
   (5)                                              ;*TO BE STUCK LOW AT THE MUX INPUT FOR THE BUFFER OR
   (5)                                              ;*''CNTR TO BUFF'' H NOT GETTING THROUGH TO THE LOAD INPUTS OF THE
   (5)                                              ;*BUFFER REGISTER.
   (5)                                              ;*IF JUST ONE OR A FEW BITS GETS MESSED UP ON THE XFERR-
   (5)                                              ;*SUSPECT THE RESPECTIVE MUX OR ETCH BETWEEN THE COUNT REG
   (5)                                              ;*AND MUX. GOOD LUCK.
   (6)                                              ;*
   (6)                                              ;* PROBABLE SYNC POINT FOR THIS TEST:: ''RD STAT B''
   (6)                                              ;*
   (5)                                              ;*
   (4)                                              ;;*************************************************************
   (3)  014054  000004                              TST114: SCOPE
   (1)
   (1)                                                                                  ;GENERATE A SYNC PULSE
   (2)
   (2)                                              ;*      MOV     @BSR,$BDDAT         ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
   (1)  014066  005737  001126                              TST     $BDDAT
   (1)                                                                                  ;MAKE SURE CLOCK A IS CLEAR.
   (1)                                                                                  ;PUT PATTERN 125252 INTO BUFFER REG.
   (1)                                                                                  ;IT SHOULD GET XFERRED TO COUNT REG.
   (1)                                                                                  ;SELECT: MODE 2, ENABLE.
   (1)                                                                                  ;NOW GENERATE A MAINTENANCE ST2.
   (1)  014072  005037  001124                              CLR     $GDDAT
   (2)
   (2)                                              ;*      MOV     $GDDAT,@ASR         ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
   (1)  014106  012737  125252  001124                      MOV     #125252,$GDDAT
   (2)
   (2)                                              ;*      MOV     $GDDAT,@ABR         ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
   (1)  014124  012737  001001  001124                      MOV     #1001,$GDDAT
   (2)
   (2)                                              ;*      MOV     $GDDAT,@ASR         ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
   (1)  014142  005037  001124                              CLR     $GDDAT
   (2)
   (2)                                              ;*      MOV     $GDDAT,@ABR         ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
   (2)
   (2)                                              ;*      MOV     @ASR,$GDDAT         ;/READ DEVICE REG ASR,PUT DATA IN $GDDAT.
   (1)  014166  052737  002000  001124                      BIS     #BIT10,$GDDAT
   (2)
   (2)                                              ;*      MOV     $GDDAT,@ASR         ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
   (1)  014204  012737  125252  001124                      MOV     #125252,$GDDAT      ;RECORD $GDDAT (PATTERN) IN CASE WE
   (1)                                                                                  ;NEED TO TYPE OUT AN ERROR.
   (1)                                                                                  ;NOW READ BACK THE BUFFER REG.
   (2)
   (2)                                              ;*      MOV     @ABR,$BDDAT         ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
   (1)  014222  023737  001126  001124                      CMP     $BDDAT,$GDDAT       ;WAS THE TRANSFER SUCCESSFUL?
   (1)  014230  001401                                      BEQ     1$                  ;IF YES THEN BR TO NEXT TEST.
   (2)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

   (1)  014232  104012                                      ERROR   12                  ;ERROR FAILED TO XFERR 125252 PATTERN
   (1)                                                                                  ;CORRECTLY FROM COUNT TO BUFFER REG.
   (1)                                                                          ;SEE INIT. COMMENT AS TO WHY
   (1)                                                                          ;IT MIGHT HAVE GONE SOUR.
   (2)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

   (1)  014234                                  1$:
   (1)          000012                                  P=P+1
  2550
  2557
  2593
   (5)                                          ;;*****************************************************************
   (4)                                          ;*TEST 115        *TEST THAT A'S COUNT REGISTER ISN'T CLEARED IN MODE 1 WHEN STP2 IS GENER
   (5)                                          ;*
   (5)                                          ;*THIS TEST IS DESIGNED TO MAKE SURE THAT WE DON'T CLEAR THE COUNT
   (5)                                          ;*REGISTER IN MODE 1 WHEN AN STP2 IS GENERATED.
   (6)                                          ;*
   (6)                                          ;* PROBABLE SYNC POINT FOR THIS TEST:: ''LD BUFF A''
   (6)                                          ;*
   (5)                                          ;*
   (4)                                          ;;*****************************************************************
   (3)  014234  000004                          TST115: SCOPE
   (1)
   (1)                                                                          ;MAKE SURE CLOCK A IS CLEAR.
   (1)                                                                          ;LOAD ALL ONES INTO BUFFER COUNT REGS.
   (1)                                                                          ;SET MODE 1.
   (1)                                                                          ;GENERATE A MAINTENANCE STP2.
   (1)                                                                          ;SEE IF IT CLEARED COUNT REG.
   (1)  014236  005037  001124                          CLR     $GDDAT
   (2)
   (2)                                          ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
   (1)  014252  012737  177777  001124                  MOV     #177777,$GDDAT
   (2)
   (2)                                          ;*      MOV     $GDDAT,@ABR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
   (1)  014270  012737  000200  001124                  MOV     #200,$GDDAT
   (2)
   (2)                                          ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
   (2)
   (2)                                          ;*      MOV     @ASR,$GDDAT     ;/READ DEVICE REG ASR,PUT DATA IN $GDDAT.
   (1)  014316  052737  002000  001124                  BIS     #BIT10,$GDDAT
   (2)
   (2)                                          ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
   (2)
   (2)                                          ;*      MOV     @ACR,$BDDAT     ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
   (1)  014344  005737  001126                          TST     $BDDAT
   (1)  014350  001001                                  BNE     1$              ;BR IF NO - NEXT TEST.
   (2)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

   (1)  014352  104012                                  ERROR   12              ;ERROR CLOCK A MODE 1 + STP2 CLEARED COUNT REG.
   (1)                                                                          ;TO SCOPE FIND OUT WHAT IS GENERATING
   (1)                                                                          ;SIGNAL ON CLR INPUT OF COUNT REG.
   (2)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

   (1)  014354                                  1$:
  2594
```

```
   (5)                                    ;;****************************************************************
   (4)                                    ;*TEST 116        *TEST THAT A'S COUNT REGISTER ISN'T CLEARED IN MODE 2 WHEN STP2 IS GENER
   (5)                                    ;*
   (5)                                    ;*THIS TEST IS DESIGNED TO MAKE SURE THAT WE DON'T CLEAR THE COUNT
   (5)                                    ;*REGISTER IN MODE 2 WHEN AN STP2 IS GENERATED.
   (6)                                    ;*
   (6)                                    ;* PROBABLE SYNC POINT FOR THIS TEST:: ''LD BUFF A''
   (6)                                    ;*
   (5)                                    ;*
   (4)                                    ;;****************************************************************
   (3)  014354  000004                    TST116: SCOPE
   (1)
   (1)                                                                  ;MAKE SURE CLOCK A IS CLEAR.
   (1)                                                                  ;LOAD ALL ONES INTO BUFFER COUNT REGS.
   (1)                                                                  ;SET MODE 2.
   (1)                                                                  ;GENERATE A MAINTENANCE STP2.
   (1)                                                                  ;SEE IF IT CLEARED COUNT REG.
   (1)  014356  005037  001124                    CLR     $GDDAT
   (2)
   (2)                                    ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
   (1)  014372  012737  177777  001124            MOV     #177777,$GDDAT
   (2)
   (2)                                    ;*      MOV     $GDDAT,@ABR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
   (1)  014410  012737  001000  001124            MOV     #1000,$GDDAT
   (2)
   (2)                                    ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
   (2)
   (2)                                    ;*      MOV     @ASR,$GDDAT     ;/READ DEVICE REG ASR,PUT DATA IN $GDDAT.
   (1)  014436  052737  002000  001124            BIS     #BIT10,$GDDAT
   (2)
   (2)                                    ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
   (2)
   (2)                                    ;*      MOV     @ACR,$BDDAT     ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
   (1)  014464  005737  001126                    TST     $BDDAT
   (1)  014470  001001                            BNE     1$              ;BR IF NO - NEXT TEST.
   (2)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

   (1)  014472  104012                            ERROR   12              ;ERROR CLOCK A MODE 2 + STP2 CLEARED COUNT REG.
   (1)                                                                  ;TO SCOPE FIND OUT WHAT IS GENERATING
   (1)                                                                  ;SIGNAL ON CLR INPUT OF COUNT REG.
   (2)
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

   (1)  014474                            1$:
  2595
  2606
  2607                                    ;;****************************************************************
   (3)                                    ;*TEST 117        *TEST THAT MODE 3 + ''STP2'' CLEARS A'S COUNT REGISTER.
   (4)                                    ;*
   (4)                                    ;*IN THIS TEST WE'LL DO A MODE 3 FOR THE FIRST TIME.
   (4)                                    ;*MODE 3 + ''STP2'' SHOULD CLEAR THE COUNT REGISTER.
   (4)                                    ;*WE KNOW FROM A PREVIOUS TEST THAT ''INIT'' L WAS ABLE TO
   (4)                                    ;*CLEAR THE REG. AND ALSO THAT WE CAN GENERATE AN ''STP2'' H.
   (4)                                    ;*''MODE A0 (1)'' H + ''MODE A1 (1)'' H + ''STP2'' H = CLEARING SIGNAL.
   (5)                                    ;*
```

```
                                        ;* PROBABLE SYNC POINT FOR THIS TEST:: ''LD BUFF A''
                                        ;*
                                        ;*
                                        ;;***************************************************************
 014474  000004                         TST117: SCOPE

                                                                       ;CLEAR CLOCK A + SELECT MODE 3.
                                                                       ;LOAD ALL ONE'S TO BUFFER + COUNTER REGS.
                                                                       ;GENERATE A MAINTENANCE ''STP2''.
                                                                       ;THIS SHOULD CLEAR THE COUNT REG.

                                                                       ;IS COUNT REG. CLEAR?
 014476  012737  001400  001124                 MOV     #1400,$GDDAT

                                        ;*      MOV     $GDDAT,@ASR    ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
 014514  012737  177777  001124                 MOV     #177777,$GDDAT

                                        ;*      MOV     $GDDAT,@ABR    ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR

                                        ;*      MOV     @ASR,$GDDAT    ;/READ DEVICE REG ASR,PUT DATA IN $GDDAT.
 014542  052737  002000  001124                 BIS     #BIT10,$GDDAT

                                        ;*      MOV     $GDDAT,@ASR    ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR

                                        ;*      MOV     @ACR,$BDDAT    ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
 014570  005737  001126                         TST     $BDDAT
 014574  001401                                 BEQ     1$             ;BR IF YES - NEXT TEST.

                 ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 014576  104012                                 ERROR   12             ;ERROR-CLOCK A-COUNT REGISTER FAILED TO
                                                                       ;CLEAR IN MODE 3 ON ''STP2'' PULSE.

                 ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 014600                                 1$:



                                        ;;***************************************************************
                                        ;*TEST 120      *TEST THE AUTODECREMENT FEATURE OF CLOCK A'S BUFFER
                                        ;*
                                        ;*THIS IS GOING TO BE A BIGGIE-WITH TWO PARTS.
                                        ;*PART1:        WE'RE LOADING THE BUFFER WITH ALL ONES; MODE 0; RATE STP1,
                                        ;*              WITH ''AUTO INC (1)'' SET (FOR FIRST TIME!). NOW WE'LL GENERATE
                                        ;*              THE THING TO WATCH FOR IS THE EXPLOSIVE COMBO OF
                                        ;*              ''MODE A0 (0)'' H + ''MODE A1 (0)'' H (MODE 0) + ''AUTO INC (1)'' H +
                                        ;*              ''A OVERFLOW'' ALL FEEDING THE DOWN COUNT SIDE OF THE 74193 CHIP.
                                        ;*              THE RESULTS SHOULD BE 177776.
                                        ;*PART2:        IF PART 1 WAS SUCCESSFUL WE'LL LOOK TO SEE IF
                                        ;*              THE COUNTER GOT LOADED WITH THE NEW VALUE 177776.
                                        ;*              THE HANG-UP HERE IS THAT ''A OVERFLOW'' FEEDS A ONE SHOT
                                        ;*              THAT GENERATES ''A RELOAD'' H. WE KNOW THAT WE CAN
                                        ;*              GET ''A RELOAD'' H BUT THE BIG TEST HERE IS SEEING IF THAT
                                        ;*              ONE SHOT SPITS OUT ''A RELOAD'' H TOO SOON TO CATCH THE BUFFER
                                        ;*              WITH ITS PANTS DOWN AS ITS DECREMENTING ITSELF.
                                        ;*
```

```
                                    ;*
                                    ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD BUFF A"
                                    ;*
                                    ;;*****************************************************************
 014600  000004                     TST120: SCOPE

                                                                        ;MAKE SURE CLOCK B IS CLEAR.
                                                                        ;MAKE SURE CLOCK A IS CLEAR.
                                                                        ;LOAD BUFFER + COUNT REGS.
                                                                        ;SET AUTO INCREMENT MODE
                                                                        ;ENABLE COUNTER, MODE 0, RATE STP1
                                                                        ;ZAP! A MAINTENANCE STP1 HAS BEEN MADE.
                                                                        ;STOP HERE AND LOOK WHAT JUST HAPPENED.
                                                                        ;1. STP1 CLOCKED THE COUNTER (SET 177777).
                                                                        ;2. COUNTER OVERFLOWED - "A OVERFLOW" L
                                                                        ;3. MODE 0 + "A OVERFLOW" L + "A AUTO INC (1)" H
                                                                        ;   DOWN COUNTED THE BUFFER.
                                                                        ;4. "A OVERFLOW" L GOES THROUGH ONE SHOT DELAY
                                                                        ;   TO GIVE "A RELOAD" H
                                                                        ;5. "A RELOAD" H CAUSES A BUFFER TO COUNTER
                                                                        ;   RELOAD.
 014602  005037  001124                       CLR     $GDDAT

                                    ;*        MOV     $GDDAT,@BSR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR

                                    ;*        MOV     $GDDAT,@ASR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
 014626  012737  177777  001124               MOV     #177777,$GDDAT

                                    ;*        MOV     $GDDAT,@ABR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
 014644  012737  000020  001124               MOV     #20,$GDDAT

                                    ;*        MOV     $GDDAT,@BSR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
 014662  012737  000015  001124               MOV     #15,$GDDAT

                                    ;*        MOV     $GDDAT,@ASR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR

                                    ;*        MOV     @ASR,$GDDAT       ;/READ DEVICE REG ASR,PUT DATA IN $GDDAT.
 014710  052737  010000  001124               BIS     #BIT12,$GDDAT

                                    ;*        MOV     $GDDAT,@ASR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR

                                              ;PART 1 DID BUFFER GET DECREMENTED?

 014726  012737  177776  001124               MOV     #177776,$GDDAT    ;SET FOR ERROR TYPEOUT IF ANY.
                                                                        ;READ THE RESULTS OF THE BUFFER.

                                    ;*        MOV     @ABR,$BDDAT       ;/READ DEVICE REG ABR,PUT DATA IN $BDDAT.
 014744  023727  001126  177776               CMP     $BDDAT,#177776    ;DID BUFFER DECREMENT TO 177776?
 014752  001402                               BEQ     1$                ;BR IF YES TO PART 2

                 ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 014754  104012                               ERROR   12                ;ERROR-CLOCK A. AFTER AN OVERFLOW
                                                                        ;WITH AUTO INC ENABLED MODE 0, THE
                                                                        ;BUFFER REGISTER FAILED TO DOWN COUNT
                                                                        ;SEE ABOVE COMMENTS FOR SEQUENCE
                                                                        ;OF EVENTS.
 014756  000411                            BR      2$                   ;IF ERROR ONLY LOOP ON PART 1.

         ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 014760                          1$:       ;PART 2 DID NEW COUNT GET TRANSFERRED TO COUNT REGISTER?

                                                                        ;READ THE COUNT REGISTER

                                 ;*        MOV     @ACR,$BDDAT          ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
 014770  023727  001126  177776            CMP     $BDDAT,#177776       ;DID NEW VALUE OF THE BUFFER
                                                                        ;REGISTER GET PROPERLY LOADED INTO
                                                                        ;THE COUNT REGISTER?
 014776  001401                            BEQ     2$                   ;BR IF YES - NEXT TEST.

         ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 015000  104012                            ERROR   12                   ;ERROR CLOCK A. NEW CONTENTS OF
                                                                        ;BUFFER REGISTER FAILED TO BE PROPERLY
                                                                        ;LOADED INTO COUNT REGISTER AFTER
                                                                        ;AUTO DECREMENT.
                                                                        ;SEE ABOVE COMMENTS FOR SEQUENCE OF EVENTS.

         ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 015002                          2$:                                    ;CLEAR AUTO INC OPTION.
 015002  005037  001124                    CLR     $GDDAT

                                 ;*        MOV     $GDDAT,@BSR          ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR

                                 ;;*****************************************************************
                                 ;*TEST 121      *TEST THAT CLOCK A'S 1 MHZ CLK CAN BE DISABLED
                                 ;*
                                 ;*FOR THIS TEST, WE'LL TRY DISABLING THE 1 MHZ CLOCK. TO DO THIS,
                                 ;*WE'LL SET THE "DISABLE OSC 1 MHZ", BIT 11 IN CLOCK B SR. THEN
                                 ;*COUNTED OR OVERFLOWED, IF SO ERROR.
                                 ;*THE UNKNOWN THING HERE IS BIT 11 SETTING THE DISABLE F/F THAT
                                 ;*GATES WITH THE 1 MHZ FREG TO PRODUCE "A 1 MHZ CLK" L
                                 ;*
                                 ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD STAT B"
                                 ;*
                                 ;;*****************************************************************
 015016  000004                  TST121: SCOPE

                                                                        ;CLEAR CLOCK A.
                                                                        ;SET THE "DISABLE OSC 1 MHZ" F/F.
                                                                        ;CLEAR THE BUFFER + COUNT REGS.
                                                                        ;START CLOCK: RATE 1 MHZ, MODE 0, GO.
 015020  005037  001124                    CLR     $GDDAT

                                 ;*        MOV     $GDDAT,@ASR          ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
 015034  012737  004000  001124            MOV     #BIT11,$GDDAT

                                 ;*        MOV     $GDDAT,@BSR          ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
 015052  005037  001124                    CLR     $GDDAT
 (1)                                 ;*      MOV     $GDDAT,@ABR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
      015066  012737  000003  001124         MOV     #3,$GDDAT

 (1)                                 ;*      MOV     $GDDAT,@ASR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
      015104  005000                         CLR     R0                ;SHORT DELAY. WE ALLOW THIS DELAY TO
      015106  105200                 1$:     INCB    R0                ;OCCUR. IF THE 1 MHZ CLOCK IS DISABLED
      015110  100376                         BPL     1$                ;NO CLOCKING OF CLOCK A WILL OCCUR.
                                                                       ;SEE SOMETHING IN THE COUNT REGISTERS

 (1)                                 ;*      MOV     @ACR,$BDDAT       ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
      015122  005737  001126                 TST     $BDDAT            ;DOES COUNT REG HAVE ANYTHING IN IT?
      015126  001007                         BNE     2$                ;YES - REPORT ERROR!

 (1)                                 ;*      MOV     @ASR,$BDDAT       ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
      015140  105737  001126                 TSTB    $BDDAT
      015144  100001                         BPL     3$                ;NO - BR NEXT TEST - NO ERROR.

                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

      015146  104012                 2$:     ERROR   12                ;ERROR - UNABLE TO DISABLE 1 MHZ CLK
                                                                       ;USING "DISABLE OSC 1 MHZ" F/F

                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

                                                                       ;CLEAR CLOCK A.
      015150  005037  001124         3$:     CLR     $GDDAT

 (1)                                 ;*      MOV     $GDDAT,@ASR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
```

```
                                          .SBTTL  *
                                          .SBTTL  * PHASE 4 CLOCK B COUNT FUNCTION TESTS
                                          .SBTTL  *



                                    ;;*****************************************************************
                                    ;*TEST 122       *TEST THAT CLOCK B WILL COUNT ONCE FIRST CLOCK B COUNT
                                    ;*
                                    ;*VERY FIRST TIME COUNTING WITH CLOCK B.
                                    ;*WHAT WE'LL TRY AND DO IS COUNT IT FROM 0 TO 1.
                                    ;*WE DO HAVE A PROBLEM HERE HOWEVER. WE CAN'T READ CLOCK B AS IT
                                    ;*COUNTS AND THERE IS NO NICE WAY OF GENERATING A ''CLOCK B'' L PULSE.
                                    ;*SO WE'RE GOING TO HAVE TO DO A COUPLE TRICKY THINGS: (1) DISABLE
                                    ;*CLOCK A'S 1 MHZ CLOCK (WE DID THAT IN LAST TEST) SO THAT WE CAN
                                    ;*GENERATE A MAINTENANCE 1 MHZ PULSE THROUGH CLOCK A (NEVER
                                    ;*DID THAT BEFORE); (2) SET CLOCK B ''FEED B TO A'' BIT 05 (NEVER DID THAT
                                    ;*BEFORE EITHER) SO THAT WE CAN ROUTE ''A 1 MHZ'' H TO MAKE
                                    ;*''B 1 MHZ'' L TO GIVE US ''CLOCK B'' L
                                    ;*
                                    ;* PROBABLE SYNC POINT FOR THIS TEST:: ''LD STAT B''
                                    ;*
                                    ;*
                                    ;;*****************************************************************
 015164  000004                     TST122: SCOPE

                                                                    ;CLEAR CLOCK B AND DISABLE 1MHZ OSC.
 015166  012737  004000  001124           MOV     #BIT11,$GDDAT

                                    ;*    MOV     $GDDAT,@BSR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
                                                                    ;CLEAR B'S BUFFER + COUNT REGS.
                                                                    ;SELECT ''FEED B TO A'', RATE 1 MHZ, GO.
 015204  005037  001124                   CLR     $GDDAT

                                    ;*    MOV     $GDDAT,@BBR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
                                                                    ;CLOCK A'S 1 MHZ CLOCK.
                                                                    ;GENERATE A MAINTENANCE 1 MHZ PULSE..
                                                                    ;DID COUNTER COUNT?

                                    ;*    MOV     @BSR,$GDDAT       ;/READ DEVICE REG BSR,PUT DATA IN $GDDAT.
 015230  052737  000043  001124           BIS     #BIT5!BIT1!BIT0,$GDDAT

                                    ;*    MOV     $GDDAT,@BSR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR

                                    ;*    MOV     @ASR,$GDDAT       ;/READ DEVICE REG ASR,PUT DATA IN $GDDAT.
 015256  052737  004000  001124           BIS     #BIT11,$GDDAT

                                    ;*    MOV     $GDDAT,@ASR       ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR

                                    ;*    MOV     @BCR,$BDDAT       ;/READ DEVICE REG BCR,PUT DATA IN $BDDAT.
 015304  005737  001126                   TST     $BDDAT
 015310  001001                           BNE     1$                ;BR IF YES TO NEXT TEST.

                 ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 015312  104014                           ERROR   14                ;ERROR - CLOCK B. FAILED TO ADVANCE
                                                                    ;COUNT REGISTER.
```

```
                                                        ;TO SCOPE: CHECK LOAD + CLEAR INPUTS TO
                                                        ;COUNT REG TO SEE IF NOT BEING HELD LOW.
                                                        ;IF OK SEE IF WE'RE GETTING ANY ''CLOCK B'' L
                                                        ;PULSES - WE SHOULD GET ONE EACH LOOP OF
                                                        ;THIS SUBTEST. ''CLOCK B'' L COMES FROM
                                                        ;THE B CLOCK TIMING SECTION. THE RATE IS
                                                        ;1 MHZ. ''B 1 MHZ'' L IS GENERATED BY
                                                        ;''A 1 MHZ'' H + ''FEED B TO A (1)'' H.
                                                        ;THE ''A 1 MHZ'' IS GENERATED BY ''MAINT
                                                        ;SIMUL 1 MHZ'' IN CLOCK A.

        ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 015314                         1$:


                                ;;*****************************************************************
                                ;*TEST 123      *TEST THE ABILITY IF CLOCK B TO COUNT FROM ZERO TO OVERFLOW
                                ;*
                                ;*LAST TEST WE FOUND OUT WE COULD ADVANCE CLOCK A'S COUNTER,
                                ;*SO IN THIS TEST WE'RE GOING TO GO FROM 0-377 COUNTING.
                                ;*WE'LL USE THE SAME PROCEDURE AS LAST TEST TO GENERATE ''CLOCK B'' L.
                                ;*UNKNOWN IS THE ABILITY OF THE F/F'S TO PROPAGATE THEIR OVERFLOWS.
                                ;*
                                ;*IF IT IS DESIRED TO START THIS TEST AT A VALUE OTHER THAN 0, CHANGE
                                ;*THE SECOND INSTR. OF THIS TEST TO A VALUE TO BE LOADED INTO THE BUFFER
                                ;*TO THAT VALUE DESIRED.
                                ;*
                                ;*
                                ;* PROBABLE SYNC POINT FOR THIS TEST:: ''LD BUFF B''
                                ;*
                                ;;*****************************************************************
 015314 000004                  TST123: SCOPE

 015316 005037 001124                   CLR     $GDDAT  ;START THE COUNTER FROM ZERO.
                                                        ;NOTE: A VALUE OTHER THAN ZERO MAY BE
                                                        ;PATCHED IN HERE IN ORDER THAT A COUNT
                                                        ;MAY BE STARTED HIGHER.
 015322 005037 001354           1$:     CLR     $TMDAT

                                ;*      MOV     $TMDAT,@ASR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
                                                        ;CLEAR CLOCK B, DISABLE 1 MHZ CLOCK A.
 015336 012737 004000 001354            MOV     #BIT11,$TMDAT

                                ;*      MOV     $TMDAT,@BSR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
                                                        ;LOAD VALUE INTO COUNT + BUFFER REGS.
                                                        ;''1$'' IS THE LOOP BACK POINT ON
                                                        ;''LOOP ON TEST'' (SW14=1) FEATURE. NORMAL
                                                        ;LOOP BACK POINT WILL BE ''2$''.


                                ;*      MOV     $GDDAT,@BBR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
                                                        ;SELECT: ''DISABLE OSC 1 MHZ''; ''FEED B TO A'';
                                                        ;RATE 1 MHZ.
                                                        ;GO. ENABL MUST BE SET AFTER ''FEED B TO A''
 015364 012737 004042 001354            MOV     #4042,$TMDAT
 (1)                                    ;*      MOV     $TMDAT,@BSR      ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
      015402  005237  001354                    INC     $TMDAT

 (1)                                    ;*      MOV     $TMDAT,@BSR      ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR

      015416                            2$:                              ;GENERATE A CLOCK PULSE.
                                                                         ;SHOULD CAUSE THE CLOCK TO
                                                                         ;INCREMENT ONCE.

 (1)                                    ;*      MOV     @ASR,$TMDAT      ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
      015426  052737  004000  001354            BIS     #BIT11,$TMDAT

 (1)                                    ;*      MOV     $TMDAT,@ASR      ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
      015444  005237  001124                    INC     $GDDAT           ;$GDDAT IS USED TO KEEP TRACK OF THE
                                                                         ;VALUE THE CLOCK SHOULD COUNT TO.


 (1)                                    ;*      MOV     @BCR,$BDDAT      ;/READ DEVICE REG BCR,PUT DATA IN $BDDAT.

      015460  123737  001126  001124            CMPB    $BDDAT,$GDDAT    ;DID THE COUNT OCCUR CORRECTLY?
      015466  001402                            BEQ     3$               ;IF YES - BR "3$".

            ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

      015470  104015                            ERROR   15               ;ERROR CLOCK B FAILED TO UPCOUNT
                                                                         ;CORRECTLY - SEE COMMENTS AT SUB-TEST
                                                                         ;HEADING FOR MORE DETAILS.

            ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

      015472  000403                            BR      4$

      015474  105737  001124            3$:     TSTB    $GDDAT           ;DID WE ACHIEVE OVERFLOW YET?
      015500  001410                            BEQ     5$               ;

      015502  032777  040000  163430    4$:     BIT     #BIT14,@SWR      ;LOOP ON CURRENT COUNT?
      015510  001742                            BEQ     2$               ;BR IF NO TO NEXT COUNT UPDATE.
      015512  162737  000001  001124            SUB     #1,$GDDAT        ;IF YES DECREMENT EXPECTED AND RELOAD.
      015520  000700                            BR      1$               ;GO TO RELOAD POINT

      015522                            5$:                              ;END SUBTEST.



                                        ;;*****************************************************************
 (3)                                    ;*TEST 124      *TEST THAT CLOCK B CAN GENERATE AN OVERFLOW
 (4)                                    ;*
 (4)                                    ;*NOW WE'LL TRY AND GENERATE "B OVERFLOW" L WHICH SETS BIT 07.
 (4)                                    ;*WE'LL DO IT BY PRESETTING THE BUFFER TO 377 AND GENERATING A "CLOCK B" L
 (4)                                    ;*WE ALREADY KNOW WE CAN ADVANCE THE COUNTER, WHAT WE
 (4)                                    ;*WANT TO SEE IS "B OVERFLOW" L COME OVER AND DIRECT SET
 (4)                                    ;*"OVERFLOW FL B" F/F (BIT 07 IN CSR).
 (5)                                    ;*
 (5)                                    ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD BUFF B"
 (5)                                    ;*
 (4)                                    ;*
```

```
  (3)                                   ;;*****************************************************************
  (2)  015522  000004                   TST124: SCOPE
 2894
 2895                                                                         ;CLEAR CLOCK A.
 2896                                                                         ;CLEAR CLOCK B.
 2897                                                                         ;SET COUNT AND BUFFER REGS.
 2898                                                                         ;SELECT "DISABLE OSC 1 MHZ"; "FEED B TO A";
 2899                                                                         ;RATE 1 MHZ.
 2900                                                                         ;GO. ENABL MUST BE SET AFTER "FEED B TO A"
 2901                                                                         ;GENERATE A CLOCK PULSE.
 2902
 2903                                                                         ;DID OVERFLOW FLAG SET?
 2904  015524  005037  001124                   CLR     $GDDAT
 2905
  (1)                                   ;*      MOV     $GDDAT,@ASR           ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
 2906
  (1)                                   ;*      MOV     $GDDAT,@BSR           ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
 2907  015550  012737  000377  001124           MOV     #377,$GDDAT
 2908
  (1)                                   ;*      MOV     $GDDAT,@BBR           ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
 2909  015566  012737  004042  001124           MOV     #4042,$GDDAT
 2910
  (1)                                   ;*      MOV     $GDDAT,@BSR           ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
 2911  015604  005237  001124                   INC     $GDDAT
 2912
  (1)                                   ;*      MOV     $GDDAT.@BSR           ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
 2913
  (1)                                   ;*      MOV     @ASR,$GDDAT           ;/READ DEVICE REG ASR,PUT DATA IN $GDDAT.
 2914  015630  052737  004000  001124           BIS     #BIT11,$GDDAT
 2915
  (1)                                   ;*      MOV     $GDDAT,@ASR           ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
 2916
  (1)                                   ;*      MOV     @BSR,$BDDAT           ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
 2917  015656  105737  001126                   TSTB    $BDDAT
 2918  015662  100402                           BMI     1$                    ;BR IF YES TO "1$".
 2919
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

 2920  015664  104014                           ERROR   14                    ;ERROR CLOCK B "B OVERFL FLAG" (CSR BIT7)
 2921                                                                         ;FAILED TO SET ON OVERFLOW.
 2922
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

 2923  015666  000411                           BR      2$
 2924  015670                           1$:                                   ;WAS COUNTER RELOAD AFTER OVERFLOW
 2925
  (1)                                   ;*      MOV     @BCR,$BDDAT           ;/READ DEVICE REG BCR,PUT DATA IN $BDDAT.
 2926  015700  022737  000377  001126           CMP     #377,$BDDAT
 2927
 2928  015706  001401                           BEQ     2$                    ;BR IF YES TO NEXT TEST.
 2929
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

 2930  015710  104014                           ERROR   14                    ;ERROR CLOCK B COUNT REG. FAILED
 2931                                                                         ;TO BE RELOADED AFTER OVERFLOW.
 2932
```

```
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 2933  015712                            2$:
 2934
 2942
 2943                                    ;;*****************************************************************
  (3)                                    ;*TEST 125       *TEST THE INIT. ABILITY OF CLOCK B'S COUNT REG.
  (4)                                    ;*
  (4)                                    ;*ALL WE'RE GOING TO DO HERE IS TEST THE INITIALIZE INPUTS
  (4)                                    ;*TO THE 74193 ICS THAT FORM THE COUNT REGISTER.
  (5)                                    ;*
  (5)                                    ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD STAT A"
  (5)                                    ;*
  (4)                                    ;*
  (3)                                    ;;*****************************************************************
  (2)  015712  000004                    TST125: SCOPE
 2944
 2945                                                                        ;CLEAR CLOCK A.
 2946                                                                        ;CLEAR CLOCK B.
 2947                                                                        ;LOAD ALL ONES TO BUFFER + COUNT REGS.
 2948  015714  005037  001124                    CLR     $GDDAT
 2949
  (1)                                    ;*      MOV     $GDDAT,@ASR         ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
 2950
  (1)                                    ;*      MOV     $GDDAT,@BSR         ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
 2951  015740  012737  000377  001124            MOV     #377,$GDDAT
 2952
  (1)                                    ;*      MOV     $GDDAT,@BBR         ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
 2953
 2954  015756  004737  032534                    JSR     PC,$RESET                           ;DO SYSTEM INIT - GENERATES "INIT" H.
 2955
 2956  015762  005037  001124                    CLR     $GDDAT              ;FIX $GDDAT FOR ERROR TYPEOUT, IF NEEDED.
 2957                                                                        ;READ B'S COUNT REGISTER, INIT
 2958
  (1)                                    ;*      MOV     @BCR,$BDDAT         ;/READ DEVICE REG BCR,PUT DATA IN $BDDAT.
 2959  015776  005737  001126                    TST     $BDDAT
 2960                                                                        ;SHOULD HAVE MADE IT AL ZEROS.
 2961  016002  001401                            BEQ     1$                  ;BR IF YES - NEXT TEST.
 2962
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 2963  016004  104007                            ERROR   7                   ;ERROR CLOCK B - INIT FAILED TO CLEAR
 2964                                                                        ;COUNT REG.
 2965
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 2966  016006                            1$:
```

```
                                        ;;*****************************************************************
                                        ;*TEST 126       *TEST THAT CLOCK B DOESN'T COUNT WHEN NO RATE IS SELECTED
                                        ;;*****************************************************************
016006  000004                          TST126: SCOPE

                                                                                   ;CLEAR CLOCK A.
                                                                                   ;CLEAR CLOCK B.
                                                                                   ;ZEROS TO BUFFER + COUNT REGS.
                                                                                   ;ENABLE COUNTER TO COUNT - RATE - 0
                                                                                   ;(NO RATE).
016010  005037  001124                          CLR     $GDDAT

                                        ;*      MOV     $GDDAT,@ASR        ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR

                                        ;*      MOV     $GDDAT,@BSR        ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR

                                        ;*      MOV     $GDDAT,@BBR        ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
016044  005237  001124                          INC     $GDDAT

                                        ;*      MOV     $GDDAT,@ASR        ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
016060  005000                                   CLR    R0                 ;DELAY FOR ANY COUNT THAT
016062  105200                          1$:     INCB    R0                 ;COULD FALSELY OCCUR.
016064  001376                                  BNE     1$                 ;THIS DELAY APPROX. 369 MS ON A
                                                                           ;PDP 11/20.

                                                                           ;DID ANY COUNT OCCUR?

                                        ;*      MOV     @ACR,$BDDAT        ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
016076  005737  001126                          TST     $BDDAT
016102  001401                                  BEQ     2$                 ;IF NO BR TO NEXT TEST.

                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

016104  104014                                  ERROR   14                 ;ERROR - CLOCK B COUNTED WHEN ENABLED BUT
                                                                           ;NO RATE SELECTED. BETTER FIND OUT
                                                                           ;WHATS GENERATING "CLOCK B" L PULSES.

                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

016106                                  2$:
 3048                                           ;/#
  (1)
  (5)                                   ;;***************************************************************
  (4)                                   ;*TEST 127       *TEST THE ABILITY OF CLOCK B TO COUNT AT 1MHZ PART 1
  (5)                                   ;*
  (5)                                   ;*THIS TEST IS DESIGNED TO TEST CLOCK B'S ABILITY TO COUNT
  (5)                                   ;*IN RATE: 1MHZ PART1
  (6)                                   ;*
  (6)                                   ;* PROBABLE SYNC POINT FOR THIS TEST:: ''LD STAT A''
  (6)                                   ;*
  (5)                                   ;*
  (4)                                   ;;***************************************************************
  (3)  016106  000004                   TST127: SCOPE
  (1)
  (1)                                                                   ;/CLEAR CLOCK A.
  (1)  016110  005037  001124                   CLR     $GDDAT
  (1)                                                                   ;/CLEAR CLOCK B.
  (1)                                                                   ;/CLEAR THE BUFFER + COUNT REGS.
  (1)                                                                   ;/SELECT: RATE: 1MHZ ; GO.
  (2)
  (2)                                   ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
  (2)
  (2)                                   ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
  (2)
  (2)                                   ;*      MOV     $GDDAT,@BBR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
  (1)  016144  012737  000003  001124           MOV     #1!2,$GDDAT
  (2)
  (2)                                   ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
  (1)
  (1)  016162  005000                           CLR     R0              ;/NOW WE'LL DO A LITTLE DELAY.
  (1)  016164  005200                   1$:     INC     R0              ;/THIS DELAY WILL AMOUNT TO APP. 269 MS.
  (1)  016166  001376                           BNE     1$              ;/ON A PDP-11/20.
  (1)
  (1)                                                                   ;/DID COUNTER COUNT AT ALL?
  (2)
  (2)                                   ;*      MOV     @BCR,$BDDAT     ;/READ DEVICE REG BCR,PUT DATA IN $BDDAT.
  (1)  016200  005737  001126                   TST     $BDDAT
  (1)  016204  001010                           BNE     2$              ;/BR IF YES - NEXT TEST.
  (1)
  (2)
  (2)                                   ;*      MOV     @BSR,$BDDAT     ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
  (1)  016216  105737  001126                   TSTB    $BDDAT
  (1)                                                                   ;/COUNT TO OVERFLOW - SO WE'LL SEE IF
  (1)                                                                   ;/THE OVERFLOW F/F SET BEFORE WE CRY WOLF.
  (1)  016222  100401                           BMI     2$              ;/BR IF SET - NEXT TEST.
  (2)
                 ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (1)  016224  104014                           ERROR   14              ;/ERROR CLOCK B - COUNTER FAILED TO COUNT
  (1)                                                                   ;/AT 1MHZ RATE.
  (2)
                 ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (1)  016226                           2$:
```

```
                                           ;/#
 (1)
 (5)                                   ;;*****************************************************************
 (4)                                   ;*TEST 130       *TEST THE ABILITY OF CLOCK B TO COUNT AT 100KHZ PART 1
 (5)                                   ;*
 (5)                                   ;*THIS TEST IS DESIGNED TO TEST CLOCK B'S ABILITY TO COUNT
 (5)                                   ;*IN RATE: 100KHZ        PART1
 (6)                                   ;*
 (6)                                   ;* PROBABLE SYNC POINT FOR THIS TEST:: ''LD STAT A''
 (6)                                   ;*
 (5)                                   ;*
 (4)                                   ;;*****************************************************************
 (3)  016226  000004                   TST130: SCOPE
 (1)
 (1)                                                                     ;/CLEAR CLOCK A.
 (1)  016230  005037  001124                   CLR     $GDDAT
 (1)                                                                     ;/CLEAR CLOCK B.
 (1)                                                                     ;/CLEAR THE BUFFER + COUNT REGS.
 (1)                                                                     ;/SELECT: RATE: 100KHZ ; GO.
 (2)
 (2)                                   ;*      MOV     $GDDAT,@ASR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
 (2)
 (2)                                   ;*      MOV     $GDDAT,@BSR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
 (2)
 (2)                                   ;*      MOV     $GDDAT,@BBR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
 (1)  016264  012737  000005  001124           MOV     #1!4,$GDDAT
 (2)
 (2)                                   ;*      MOV     $GDDAT,@BSR      ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
 (1)
 (1)  016302  005000                           CLR     R0               ;/NOW WE'LL DO A LITTLE DELAY.
 (1)  016304  005200                   1$:     INC     R0               ;/THIS DELAY WILL AMOUNT TO APP. 269 MS.
 (1)  016306  001376                           BNE     1$               ;/ON A PDP-11/20.
 (1)
 (1)                                                                     ;/DID COUNTER COUNT AT ALL?
 (2)
 (2)                                   ;*      MOV     @BCR,$BDDAT      ;/READ DEVICE REG BCR,PUT DATA IN $BDDAT.
 (1)  016320  005737  001126                   TST     $BDDAT
 (1)  016324  001010                           BNE     2$               ;/BR IF YES - NEXT TEST.
 (1)
 (2)
 (2)                                   ;*      MOV     @BSR,$BDDAT      ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
 (1)  016336  105737  001126                   TSTB    $BDDAT
 (1)                                                                     ;/COUNT TO OVERFLOW - SO WE'LL SEE IF
 (1)                                                                     ;/THE OVERFLOW F/F SET BEFORE WE CRY WOLF.
 (1)  016342  100401                           BMI     2$               ;/BR IF SET - NEXT TEST.
 (2)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (1)  016344  104014                           ERROR   14               ;/ERROR CLOCK B - COUNTER FAILED TO COUNT
 (1)                                                                     ;/AT 100KHZ RATE.
 (2)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (1)  016346                           2$:
```

```
 3050                                      ;/#
  (1)
  (5)                              ;;*****************************************************************
  (4)                              ;*TEST 131        *TEST THE ABILITY OF CLOCK B TO COUNT AT 10KHZ PART 1
  (5)                              ;*
  (5)                              ;*THIS TEST IS DESIGNED TO TEST CLOCK B'S ABILITY TO COUNT
  (5)                              ;*IN RATE: 10KHZ          PART1
  (6)                              ;*
  (6)                              ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD STAT A"
  (6)                              ;*
  (5)                              ;*
  (4)                              ;;*****************************************************************
  (3)  016346  000004              TST131: SCOPE
  (1)
  (1)                                                                   ;/CLEAR CLOCK A.
  (1)  016350  005037  001124              CLR     $GDDAT
  (1)                                                                   ;/CLEAR CLOCK B.
  (1)                                                                   ;/CLEAR THE BUFFER + COUNT REGS.
  (1)                                                                   ;/SELECT: RATE: 10KHZ ; GO.
  (2)
  (2)                              ;*      MOV     $GDDAT,@ASR        ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
  (2)
  (2)                              ;*      MOV     $GDDAT,@BSR        ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
  (2)
  (2)                              ;*      MOV     $GDDAT,@BBR        ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
  (1)  016404  012737  000007  001124      MOV     #1!6,$GDDAT
  (2)
  (2)                              ;*      MOV     $GDDAT,@BSR        ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
  (1)
  (1)  016422  005000                      CLR     R0                 ;/NOW WE'LL DO A LITTLE DELAY.
  (1)  016424  005200              1$:     INC     R0                 ;/THIS DELAY WILL AMOUNT TO APP. 269 MS.
  (1)  016426  001376                      BNE     1$                 ;/ON A PDP-11/20.
  (1)
  (1)                                                                   ;/DID COUNTER COUNT AT ALL?
  (2)
  (2)                              ;*      MOV     @BCR,$BDDAT        ;/READ DEVICE REG BCR,PUT DATA IN $BDDAT.
  (1)  016440  005737  001126              TST     $BDDAT
  (1)  016444  001010                      BNE     2$                 ;/BR IF YES - NEXT TEST.
  (1)
  (2)
  (2)                              ;*      MOV     @BSR,$BDDAT        ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
  (1)  016456  105737  001126              TSTB    $BDDAT
  (1)                                                                   ;/COUNT TO OVERFLOW - SO WE'LL SEE IF
  (1)                                                                   ;/THE OVERFLOW F/F SET BEFORE WE CRY WOLF.
  (1)  016462  100401                      BMI     2$                 ;/BR IF SET - NEXT TEST.
  (2)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (1)  016464  104014                      ERROR   14                 ;/ERROR CLOCK B - COUNTER FAILED TO COUNT
  (1)                                                                   ;/AT 10KHZ RATE.
  (2)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (1)  016466                      2$:
```

```
                                        ;/#
 (1)
 (5)                                    ;;*************************************************************
 (4)                                    ;*TEST 132      *TEST THE ABILITY OF CLOCK B TO COUNT AT 1KHZ PART 1
 (5)                                    ;*
 (5)                                    ;*THIS TEST IS DESIGNED TO TEST CLOCK B'S ABILITY TO COUNT
 (5)                                    ;*IN RATE: 1KHZ PART1
 (6)                                    ;*
 (6)                                    ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD STAT A"
 (6)                                    ;*
 (5)                                    ;*
 (4)                                    ;;*************************************************************
 (3)  016466  000004                    TST132: SCOPE
 (1)
 (1)                                                                    ;/CLEAR CLOCK A.
 (1)  016470  005037  001124                    CLR     $GDDAT
 (1)                                                                    ;/CLEAR CLOCK B.
 (1)                                                                    ;/CLEAR THE BUFFER + COUNT REGS.
 (1)                                                                    ;/SELECT: RATE: 1KHZ ; GO.
 (2)
 (2)                                    ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
 (2)
 (2)                                    ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
 (2)
 (2)                                    ;*      MOV     $GDDAT,@BBR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
 (1)  016524  012737  000011  001124            MOV     #1!10,$GDDAT
 (2)
 (2)                                    ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
 (1)
 (1)  016542  005000                            CLR     R0              ;/NOW WE'LL DO A LITTLE DELAY.
 (1)  016544  005200                    1$:     INC     R0              ;/THIS DELAY WILL AMOUNT TO APP. 269 MS.
 (1)  016546  001376                            BNE     1$              ;/ON A PDP-11/20.
 (1)
 (1)                                                                    ;/DID COUNTER COUNT AT ALL?
 (2)
 (2)                                    ;*      MOV     @BCR,$BDDAT     ;/READ DEVICE REG BCR,PUT DATA IN $BDDAT.
 (1)  016560  005737  001126                    TST     $BDDAT
 (1)  016564  001010                            BNE     2$              ;/BR IF YES - NEXT TEST.
 (1)
 (2)
 (2)                                    ;*      MOV     @BSR,$BDDAT     ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
 (1)  016576  105737  001126                    TSTB    $BDDAT
 (1)                                                                    ;/COUNT TO OVERFLOW - SO WE'LL SEE IF
 (1)                                                                    ;/THE OVERFLOW F/F SET BEFORE WE CRY WOLF.
 (1)  016602  100401                            BMI     2$              ;/BR IF SET - NEXT TEST.
 (2)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (1)  016604  104014                            ERROR   14              ;/ERROR CLOCK B - COUNTER FAILED TO COUNT
 (1)                                                                    ;/AT 1KHZ RATE.
 (2)
              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (1)  016606                            2$:
```

```
 3052                                   ;/#
  (1)
  (5)                                   ;;*****************************************************************
  (4)                                   ;*TEST 133      *TEST THE ABILITY OF CLOCK B TO COUNT AT 100HZ PART 1
  (5)                                   ;*
  (5)                                   ;*THIS TEST IS DESIGNED TO TEST CLOCK B'S ABILITY TO COUNT
  (5)                                   ;*IN RATE: 100HZ        PART1
  (6)                                   ;*
  (6)                                   ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD STAT A"
  (6)                                   ;*
  (5)                                   ;*
  (4)                                   ;;*****************************************************************
  (3) 016606 000004                     TST133: SCOPE
  (1)
  (1)                                                                   ;/CLEAR CLOCK A.
  (1) 016610 005037 001124                      CLR     $GDDAT
  (1)                                                                   ;/CLEAR CLOCK B.
  (1)                                                                   ;/CLEAR THE BUFFER + COUNT REGS.
  (1)                                                                   ;/SELECT: RATE: 100HZ ; GO.
  (2)
  (2)                                   ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
  (2)
  (2)                                   ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
  (2)
  (2)                                   ;*      MOV     $GDDAT,@BBR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
  (1) 016644 012737 000011 001124               MOV     #1!11,$GDDAT
  (2)
  (2)                                   ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
  (1)
  (1) 016662 005000                             CLR     R0              ;/NOW WE'LL DO A LITTLE DELAY.
  (1) 016664 005200                     1$:     INC     R0              ;/THIS DELAY WILL AMOUNT TO APP. 269 MS.
  (1) 016666 001376                             BNE     1$              ;/ON A PDP-11/20.
  (1)
  (1)                                                                   ;/DID COUNTER COUNT AT ALL?
  (2)
  (2)                                   ;*      MOV     @BCR,$BDDAT     ;/READ DEVICE REG BCR,PUT DATA IN $BDDAT.
  (1) 016700 005737 001126                      TST     $BDDAT
  (1) 016704 001010                             BNE     2$              ;/BR IF YES - NEXT TEST.
  (1)
  (2)
  (2)                                   ;*      MOV     @BSR,$BDDAT     ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
  (1) 016716 105737 001126                      TSTB    $BDDAT
  (1)                                                                   ;/COUNT TO OVERFLOW - SO WE'LL SEE IF
  (1)                                                                   ;/THE OVERFLOW F/F SET BEFORE WE CRY WOLF.
  (1) 016722 100401                             BMI     2$              ;/BR IF SET - NEXT TEST.
  (2)
            ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (1) 016724 104014                             ERROR   14              ;/ERROR CLOCK B - COUNTER FAILED TO COUNT
  (1)                                                                   ;/AT 100HZ RATE.
  (2)
            ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (1) 016726                            2$:
```

```
3053                                          ;/#
 (1)
 (5)                                  ;;*****************************************************************
 (4)                                  ;*TEST 134       *TEST THE ABILITY OF CLOCK B TO COUNT AT LINE-FREQ PART 1
 (5)                                  ;*
 (5)                                  ;*THIS TEST IS DESIGNED TO TEST CLOCK B'S ABILITY TO COUNT
 (5)                                  ;*IN RATE: LINE-FREQ     PART1
 (6)                                  ;*
 (6)                                  ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD STAT A"
 (6)                                  ;*
 (5)                                  ;*
 (4)                                  ;;*****************************************************************
 (3)  016726  000004                  TST134: SCOPE
 (1)
 (1)                                                                        ;/CLEAR CLOCK A.
 (1)  016730  005037  001124                  CLR     $GDDAT
 (1)                                                                        ;/CLEAR CLOCK B.
 (1)                                                                        ;/CLEAR THE BUFFER + COUNT REGS.
 (1)                                                                        ;/SELECT: RATE: LINE-FREQ ; GO.
 (2)
 (2)                                  ;*      MOV     $GDDAT,@ASR          ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR
 (2)
 (2)                                  ;*      MOV     $GDDAT,@BSR          ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
 (2)
 (2)                                  ;*      MOV     $GDDAT,@BBR          ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
 (1)  016764  012737  000017  001124          MOV     #1!16,$GDDAT
 (2)
 (2)                                  ;*      MOV     $GDDAT,@BSR          ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
 (1)
 (1)  017002  005000                          CLR     R0                   ;/NOW WE'LL DO A LITTLE DELAY.
 (1)  017004  005200                  1$:     INC     R0                   ;/THIS DELAY WILL AMOUNT TO APP. 269 MS.
 (1)  017006  001376                          BNE     1$                   ;/ON A PDP-11/20.
 (1)
 (1)                                                                        ;/DID COUNTER COUNT AT ALL?
 (2)
 (2)                                  ;*      MOV     @BCR,$BDDAT          ;/READ DEVICE REG BCR,PUT DATA IN $BDDAT.
 (1)  017020  005737  001126                  TST     $BDDAT
 (1)  017024  001010                          BNE     2$                   ;/BR IF YES - NEXT TEST.
 (1)
 (2)
 (2)                                  ;*      MOV     @BSR,$BDDAT          ;/READ DEVICE REG BSR,PUT DATA IN $BDDAT.
 (1)  017036  105737  001126                  TSTB    $BDDAT
 (1)                                                                        ;/COUNT TO OVERFLOW - SO WE'LL SEE IF
 (1)                                                                        ;/THE OVERFLOW F/F SET BEFORE WE CRY WOLF.
 (1)  017042  100401                          BMI     2$                   ;/BR IF SET - NEXT TEST.
 (2)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (1)  017044  104014                          ERROR   14                   ;/ERROR CLOCK B - COUNTER FAILED TO COUNT
 (1)                                                                        ;/AT LINE-FREQ RATE.
 (2)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (1)  017046                          2$:
3054
3063
```

```
                                      ;;*************************************************************
 (3)                                  ;*TEST 135       *TEST THE "FEED B TO A" 24 BIT COUNTER FEATURE OF CLOCKS A + B
 (4)                                  ;*
 (4)                                  ;*WE'RE GOING TO TEST CLOCKS A+B AS A 24 BIT COUNTER; THAT IS;
 (4)                                  ;*WE'RE GOINT TO TAKE THE OVERFLOW FROM CLOCK B AND FEED IT INTO
 (4)                                  ;*CLOCK A.
 (5)                                  ;*
 (5)                                  ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD BUFF B"
 (5)                                  ;*
 (4)                                  ;*
 (3)                                  ;;*************************************************************
 (2) 017046 000004                    TST135: SCOPE

                                                                  ;CLEAR CLOCK A.
                                                                  ;CLEAR CLOCK B.
                                                                  ;CLEAR A'S BUFFER + COUNT REGISTERS.
                                                                  ;PRESET B'S BUFFER + COUNT TO -1 FROM
                                                                  ;OVERFLOW.
                                                                  ;SELECT: "DISABLE OSC 1 MHZ"; RATE 1 MHZ;
                                                                  ;"FEED B TO A"
                                                                  ;SET ENABL. MUST BE SET AFTER "FEED B TO A".
                                                                  ;ENABLE CLOCK A; MODE 0; RATE 0.
                                                                  ;SIMULATE A 1 MHZ PULSE - THIS PULSE
                                                                  ;WILL CLOCK CLOCK B'S COUNTER
                                                                  ;REGISTER. AN OVERFLOW WILL
                                                                  ;OCCUR - THAT OVERFLOW SHOULD
                                                                  ;CLOCK CLOCK A'S COUNT REGISTER.
                                                                  ;DID CLOCK A'S COUNT REG GET CLOCKED?
     017050 005037 001124                     CLR     $GDDAT

 (1)                                  ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR

 (1)                                  ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR

 (1)                                  ;*      MOV     $GDDAT,@ABR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR
     017104 012737 000377 001124              MOV     #377,$GDDAT

 (1)                                  ;*      MOV     $GDDAT,@BBR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BBR
     017122 012737 004042 001124              MOV     #4042,$GDDAT

 (1)                                  ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
     017140 005237 001124                     INC     $GDDAT

 (1)                                  ;*      MOV     $GDDAT,@BSR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG BSR
     017154 012737 000001 001124              MOV     #1,$GDDAT

 (1)                                  ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR

 (1)                                  ;*      MOV     @ASR,$GDDAT     ;/READ DEVICE REG ASR,PUT DATA IN $GDDAT.
     017202 052737 004000 001124              BIS     #BIT11,$GDDAT

 (1)                                  ;*      MOV     $GDDAT,@ASR     ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR

 (1)                                  ;*      MOV     @ACR,$BDDAT     ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
     017230 005737 001126                     TST     $BDDAT

 3099  017234  001001                  BNE     1$                      ;IF YES THEN BR NEXT TEST.
 3100
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

 3101  017236  104014                  ERROR   14                      ;ERROR - UNABLE TO CLOCK CLOCK A'S
 3102                                                                  ;COUNT REGISTER WITH THE OVERFLOW
 3103                                                                  ;FROM CLOCK B.
 3104                                                                  ;THE MOST LOGICAL PLACE TO START
 3105                                                                  ;WOULD BE !A CLOCK TIMING''.
 3106                                                                  ;''FEED B TO A (1)'' H + 'B OVERFLOW'' H
 3107                                                                  ;SHOULD BE COMING TOGETHER GOING
 3108                                                                  ;INTO THE MUX - BEGING SELECTED AND
 3109                                                                  ;COMING OUT OF THE MUX TO BECOME
 3110                                                                  ;''CLOCK A'' L.
 3111
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

 3112  017240                  1$:
 3113                          .SBTTL  *
 3114                          .SBTTL  * PHASE 6 CLOCK A+B ADVANCE TESTING
 3115                          .SBTTL  *
 3116
```

```
                                          ;/#

                                          ;;*************************************************************
       (3)                                ;*TEST 136      *TEST THAT THE TRAILING EDGE OF STP1 WILL INCR. COUNTER
       (4)                                ;*
       (4)                                ;*IN THIS TEST WE'LL SEE IF WE CATCH THE FIRST COUNT
       (4)                                ;*AFTER STP1 COMES IN AND SETS THE ENABLE F/F ('ST1 ENB COUNTER'
       (4)                                ;*SET).
       (4)                                ;*WHAT WE SHOULD SEE IS THE LEADING EDGE OF ST1 COME
       (4)                                ;*IN AND SET THE ENB F/F AND THE TRAILING EDGE TRIGGER
       (4)                                ;*A 'CLOCK A' PULSE TO INCREMENT THE COUNTER.
       (4)                                ;*WE KNOW FROM A PREVIOUS TEST THAT AN STP1 WILL
       (4)                                ;*COME IN AND SET 'ENABL CNTR A' F/F AND THAT THE
       (4)                                ;*COUNTER WILL INCREMENT, SO WHATS HAPPENING IS WE'RE ACCUALLY
       (4)                                ;*LOOKING AT THE TRAILING EDGE OF STP1 TO SEE IF ITS DOING
       (4)                                ;*THE INCREMENTING
       (4)                                ;*
       (5)                                ;*
       (5)                                ;* PROBABLE SYNC POINT FOR THIS TEST:: ''LD BUFF A''
       (5)                                ;*
       (3)                                ;;*************************************************************
       (2)  017240  000004                TST136: SCOPE

                                                                         ;CLR CLK A, SET 'ST1 ENB COUNTER'.;RATE:STP1.
                                                                         ;CLR COUNT + BUFFER REGS.
                                                                         ;GENERATE A MAINTENANCE ST1.
                                                                         ;THE LEADING EDGE SHOULD CAUSE
                                                                         ;'.ENABL CNTR A' F/F TO SET (CSR BIT 00).
                                                                         ;THE TRAILING EDGE SHOULD CLOCK
                                                                         ;THE COUNTER ONCE.
            017242  012737  000001  001354          MOV     #BIT0,$TMDAT

       (1)                                ;*        MOV     $TMDAT,@ASR    ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
            017260  005037  001124                  CLR     $GDDAT

       (1)                                ;*        MOV     $GDDAT,@ABR    ;/ PUT DATA FROM $GDDAT TO DEVICE REG ABR

       (1)                                ;*        MOV     @ASR,$GDDAT    ;/READ DEVICE REG ASR,PUT DATA IN $GDDAT.
            017304  052737  010000  001124          BIS     #BIT12,$GDDAT

       (1)                                ;*        MOV     $GDDAT,@ASR    ;/ PUT DATA FROM $GDDAT TO DEVICE REG ASR

            017322  012737  000001  001124          MOV     #1,$GDDAT      ;SET S/B FOR ERROR TYPEOUT IF NEEDED.
                                                                         ;READ THE COUNT REGISTER.

       (1)                                ;*        MOV     @ACR,$BDDAT    ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
            017340  023737  001126  001124          CMP     $BDDAT,$GDDAT  ;DID THE COUNT REG COUNT ONCE?
            017346  001401                          BEQ     1$             ;BR IF YES TO NEXT TEST.


                   ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

            017350  104012                          ERROR   12             ;ST1 FAILED TO COUNT
                                                                         ;CLOCK A'S COUNT REG. AFTER SETTING
                                                                         ;'ENABL CNTR A' - SEE TEST HEADING
```

```
 3164                                                                    ;COMMENTS
 3165
                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 3166
 3167  017352                            1$:
 3168
 3257
```

```
                                                  ;/#
 (1)
 (5)                                     ;;*************************************************************
 (4)                                     ;*TEST 137         *TEST CLOCK A'S 100KHZ DIVIDER
 (5)                                     ;*
 (5)                                     ;*IN THIS TEST WE'LL SEE IF THE 100KHZ DIVIDER WILL DIVIDE 1MHZ
 (5)                                     ;*BY 10 TO GIVE US A 100KHZ CLK L PULSE.
 (5)                                     ;*TO DO THIS, WE'LL DISABLE THE REGULAR 1MHZ CLK PULSE AND
 (5)                                     ;*PULSES THAT IN TURN SHOULD DIVIDE BY TEN TO GIVE US ONE 100KHZ
 (5)                                     ;*PULSES.
 (5)                                     ;*THEN WE'LL GENERATE 9 MORE 1MHZ PULSES AND MAKE
 (5)                                     ;*SURE THAT WE DON'T GET ANOTHER 100KHZ PULSE.
 (5)                                     ;*
 (6)                                     ;*
 (6)                                     ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD BUFF A"
 (6)                                     ;*
 (4)                                     ;;*************************************************************
 (3)   017352  000004                    TST137: SCOPE
 (1)
 (1)                                                                        ;/CLEAR CLOCK B.
 (1)                                                                        ;/CLEAR CLOCK A.
 (1)                                                                        ;/CLEAR A'S BUFFER + COUNT REGS.
 (1)                                                                        ;/DISABLE THE 1MHZ OSC.
 (1)                                                                        ;/ENABLE CNTR, RATE: 100KHZ ;MODE.
 (1)
 (1)   017354  005037  001354                     CLR      $TMDAT
 (2)
 (2)                                     ;*       MOV      $TMDAT,@BSR      ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
 (2)
 (2)                                     ;*       MOV      $TMDAT,@ASR      ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
 (2)
 (2)                                     ;*       MOV      $TMDAT,@ABR      ;/ PUT DATA FROM $TMDAT TO DEVICE REG ABR
 (1)   017410  012737  004000  001354             MOV      #BIT11,$TMDAT
 (2)
 (2)                                     ;*       MOV      $TMDAT,@BSR      ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
 (2)
 (2)                                     ;*       MOV      @ASR,$TMDAT      ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
 (1)   017436  052737  000405  001354             BIS      #401!4,$TMDAT
 (2)
 (2)                                     ;*       MOV      $TMDAT,@ASR      ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
 (1)
 (1)                                                                        ;/SET TO GENERATE ON 1MHZ PULSES
 (1)   017454  012700  177766                     MOV      #-10.,R0
 (1)
 (1)   017460                            1$:                                ;/GENERATE 1 1MHZ PULSE
 (1)                                                                        ;/HAS COUNTER ADVANCED ANY?
 (2)
 (2)                                     ;*       MOV      @ASR,$TMDAT      ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
 (1)   017470  052737  004000  001354             BIS      #BIT11,$TMDAT
 (2)
 (2)                                     ;*       MOV      $TMDAT,@ASR      ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
 (2)
 (2)                                     ;*       MOV      @ACR,$BDDAT      ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
 (1)   017516  005737  001126                     TST      $BDDAT
 (1)   017522  001002                             BNE      10$              ;/IF SO EXIT THIS LOOP.
 (1)                                                                        ;/NOTE: WHEN WE DISABLED THE 1 MHZ.
```

```
(1)                                                                  ;/OSC.,THE DIVIDER COULD HAVE
(1)                                                                  ;/AND COUNT LEFT IN IT.
(1)                                                                  ;/AFTER THIS LOOP ,WE SHOULD BE SUNK.
(1)  017524  005200                           INC     R0              ;/DONE 10. 1MHZ PULSES?
(1)  017526  001354                           BNE     1$              ;/IF NOT - DO ANOTHER.
(1)
(1)  017530  012737  000001  001124  10$:     MOV     #1,$GDDAT       ;/SET FOR ERROR TYPEOUT IF NEEDED.
(1)
(1)                                                                  ;/READ THE COUNTER.
(2)
(2)                                  ;*       MOV     @ACR,$BDDAT     ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
(1)
(1)  017546  023737  001126  001124           CMP     $BDDAT,$GDDAT   ;/DID THE COUNTER ADVANCE ONCE?
(1)  017554  001402                           BEQ     2$              ;/IF YES - NEXT CHECK.
(2)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

(1)  017556  104012                           ERROR   12              ;/ERROR - CLOCK A - 100KHZ - PULSE
(1)                                                                  ;/NOT GENERATED WHEN 10 1MHZ PULSES
(2)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

(1)  017560  000430                           BR      4$
(1)  017562  012700  000011          2$:      MOV     #9.,R0  ;/GET THE NUMBER OF '1 MHZ' H PULSES
(1)
(1)  017566                          3$:                              ;/GENERATE 9 1MHZ PULSES
(2)
(2)                                  ;*       MOV     @ASR,$TMDAT     ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
(1)  017576  052737  004000  001354           BIS     #BIT11,$TMDAT
(2)
(2)                                  ;*       MOV     $TMDAT,@ASR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
(1)  017614  005300                           DEC     R0              ;/INORDER TO CHECK TO SEE THAT
(1)  017616  001363                           BNE     3$              ;/WE DON'T GENERATE ANOTHER 100KHZ PULSE.
(1)
(1)                                                                  ;/READ THE COUNTER
(2)
(2)                                  ;*       MOV     @ACR,$BDDAT     ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
(1)  017630  023737  001126  001124           CMP     $BDDAT,$GDDAT   ;/WAS ANOTHER 100KHZ PULSE GENERATED?
(1)  017636  001401                           BEQ     4$              ;/NO-GO TO NEXT TEST!
(1)
(2)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

(1)  017640  104012                           ERROR   12              ;/ERROR CLOCK A WE SEEM TO HAVE
(1)                                                                  ;/GENERATED A SECOND 100KHZ PULSE
(1)                                                                  ;/ON ONLY 9 1MHZ PULSES.
(2)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

(1)  017642                          4$:
 3259                                           ;/#
  (1)
  (5)                                   ;;*************************************************************
  (4)                                   ;*TEST 140        *TEST CLOCK A'S 10KHZ DIVIDER
  (5)                                   ;*
  (5)                                   ;*IN THIS TEST WE'LL SEE IF THE 10KHZ DIVIDER WILL DIVIDE 100KHZ
  (5)                                   ;*BY 10 TO GIVE US A 10KHZ CLK L PULSE.
  (5)                                   ;*TO DO THIS, WE'LL DISABLE THE REGULAR 1MHZ CLK PULSE AND
  (5)                                   ;*PULSES THAT IN TURN SHOULD DIVIDE BY TEN TO GIVE US ONE 10KHZ
  (5)                                   ;*PULSES.
  (5)                                   ;*THEN WE'LL GENERATE 9 MORE 100KHZ PULSES AND MAKE
  (5)                                   ;*SURE THAT WE DON'T GET ANOTHER 10KHZ PULSE.
  (5)                                   ;*
  (6)                                   ;*
  (6)                                   ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD BUFF A"
  (6)                                   ;*
  (4)                                   ;;*************************************************************
  (3)  017642  000004                   TST140: SCOPE
  (1)
  (1)                                                                   ;/CLEAR CLOCK B.
  (1)                                                                   ;/CLEAR CLOCK A.
  (1)                                                                   ;/CLEAR A'S BUFFER + COUNT REGS.
  (1)                                                                   ;/DISABLE THE 1MHZ OSC.
  (1)                                                                   ;/ENABLE CNTR, RATE: 10KHZ ;MODE.
  (1)
  (1)  017644  005037  001354                   CLR     $TMDAT
  (2)
  (2)                                   ;*      MOV     $TMDAT,@BSR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
  (2)
  (2)                                   ;*      MOV     $TMDAT,@ASR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
  (2)
  (2)                                   ;*      MOV     $TMDAT,@ABR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG ABR
  (1)  017700  012737  004000  001354           MOV     #BIT11,$TMDAT
  (2)
  (2)                                   ;*      MOV     $TMDAT,@BSR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
  (2)
  (2)                                   ;*      MOV     @ASR,$TMDAT     ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
  (1)  017726  052737  000407  001354           BIS     #401!6,$TMDAT
  (2)
  (2)                                   ;*      MOV     $TMDAT,@ASR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
  (1)
  (1)                                                                   ;/SET TO GENERATE ON 1MHZ PULSES
  (1)  017744  012700  177634                   MOV     #-100.,R0
  (1)
  (1)  017750                           1$:                             ;/GENERATE 1 1MHZ PULSE
  (1)                                                                   ;/HAS COUNTER ADVANCED ANY?
  (2)
  (2)                                   ;*      MOV     @ASR,$TMDAT     ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
  (1)  017760  052737  004000  001354           BIS     #BIT11,$TMDAT
  (2)
  (2)                                   ;*      MOV     $TMDAT,@ASR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
  (2)
  (2)                                   ;*      MOV     @ACR,$BDDAT     ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
  (1)  020006  005737  001126                   TST     $BDDAT
  (1)  020012  001002                           BNE     10$             ;/IF SO EXIT THIS LOOP.
  (1)                                                                   ;/NOTE: WHEN WE DISABLED THE 1 MHZ.
```

```
(1)                                                              ;/OSC.,THE DIVIDER COULD HAVE
(1)                                                              ;/AND COUNT LEFT IN IT.
(1)                                                              ;/AFTER THIS LOOP ,WE SHOULD BE SUNK.
(1)  020014  005200                          INC     R0          ;/DONE 100. 1MHZ PULSES?
(1)  020016  001354                          BNE     1$          ;/IF NOT - DO ANOTHER.
(1)
(1)  020020  012737  000001  001124  10$:    MOV     #1,$GDDAT   ;/SET FOR ERROR TYPEOUT IF NEEDED.
(1)
(1)                                                              ;/READ THE COUNTER.
(2)
(2)                                  ;*      MOV     @ACR,$BDDAT ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
(1)
(1)  020036  023737  001126  001124          CMP     $BDDAT,$GDDAT ;/DID THE COUNTER ADVANCE ONCE?
(1)  020044  001402                          BEQ     2$          ;/IF YES - NEXT CHECK.
(2)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(1)  020046  104012                          ERROR   12          ;/ERROR - CLOCK A - 10KHZ - PULSE
(1)                                                              ;/NOT GENERATED WHEN 10 100KHZ PULSES
(2)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(1)  020050  000430                          BR      4$
(1)  020052  012700  000143          2$:     MOV     #99.,R0 ;/GET THE NUMBER OF '1 MHZ' H PULSES
(1)
(1)  020056                          3$:                         ;/GENERATE 9 100KHZ PULSES
(2)
(2)                                  ;*      MOV     @ASR,$TMDAT ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
(1)  020066  052737  004000  001354          BIS     #BIT11,$TMDAT
(2)
(2)                                  ;*      MOV     $TMDAT,@ASR ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
(1)  020104  005300                          DEC     R0          ;/INORDER TO CHECK TO SEE THAT
(1)  020106  001363                          BNE     3$          ;/WE DON'T GENERATE ANOTHER 10KHZ PULSE.
(1)
(1)                                                              ;/READ THE COUNTER
(2)
(2)                                  ;*      MOV     @ACR,$BDDAT ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
(1)  020120  023737  001126  001124          CMP     $BDDAT,$GDDAT ;/WAS ANOTHER 10KHZ PULSE GENERATED?
(1)  020126  001401                          BEQ     4$          ;/NO-GO TO NEXT TEST!
(1)
(2)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(1)  020130  104012                          ERROR   12          ;/ERROR CLOCK A WE SEEM TO HAVE
(1)                                                              ;/GENERATED A SECOND 10KHZ PULSE
(1)                                                              ;/ON ONLY 9 100KHZ PULSES.
(2)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(1)  020132                          4$:
 3260                                           ;/#
  (1)
  (5)                                   ;;*****************************************************************
  (4)                                   ;*TEST 141      *TEST CLOCK A'S 1KHZ DIVIDER
  (5)                                   ;*
  (5)                                   ;*IN THIS TEST WE'LL SEE IF THE 1KHZ DIVIDER WILL DIVIDE 10KHZ
  (5)                                   ;*BY 10 TO GIVE US A 1KHZ CLK L PULSE.
  (5)                                   ;*TO DO THIS, WE'LL DISABLE THE REGULAR 1MHZ CLK PULSE AND
  (5)                                   ;*PULSES THAT IN TURN SHOULD DIVIDE BY TEN TO GIVE US ONE 1KHZ
  (5)                                   ;*PULSES.
  (5)                                   ;*THEN WE'LL GENERATE 9 MORE 10KHZ PULSES AND MAKE
  (5)                                   ;*SURE THAT WE DON'T GET ANOTHER 1KHZ PULSE.
  (5)                                   ;*
  (6)                                   ;*
  (6)                                   ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD BUFF A"
  (6)                                   ;*
  (4)                                   ;;*****************************************************************
  (3)  020132  000004                   TST141: SCOPE
  (1)
  (1)                                                                   ;/CLEAR CLOCK B.
  (1)                                                                   ;/CLEAR CLOCK A.
  (1)                                                                   ;/CLEAR A'S BUFFER + COUNT REGS.
  (1)                                                                   ;/DISABLE THE 1MHZ OSC.
  (1)                                                                   ;/ENABLE CNTR, RATE: 1KHZ ;MODE.
  (1)
  (1)  020134  005037  001354                   CLR     $TMDAT
  (2)
  (2)                                   ;*      MOV     $TMDAT,@BSR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
  (2)
  (2)                                   ;*      MOV     $TMDAT,@ASR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
  (2)
  (2)                                   ;*      MOV     $TMDAT,@ABR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG ABR
  (1)  020170  012737  004000  001354           MOV     #BIT11,$TMDAT
  (2)
  (2)                                   ;*      MOV     $TMDAT,@BSR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
  (2)
  (2)                                   ;*      MOV     @ASR,$TMDAT     ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
  (1)  020216  052737  000411  001354           BIS     #401!10,$TMDAT
  (2)
  (2)                                   ;*      MOV     $TMDAT,@ASR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
  (1)
  (1)                                                                   ;/SET TO GENERATE ON 1MHZ PULSES
  (1)  020234  012700  176030                   MOV     #-1000.,R0
  (1)
  (1)  020240                           1$:                             ;/GENERATE 1 1MHZ PULSE
  (1)                                                                   ;/HAS COUNTER ADVANCED ANY?
  (2)
  (2)                                   ;*      MOV     @ASR,$TMDAT     ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
  (1)  020250  052737  004000  001354           BIS     #BIT11,$TMDAT
  (2)
  (2)                                   ;*      MOV     $TMDAT,@ASR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
  (2)
  (2)                                   ;*      MOV     @ACR,$BDDAT     ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
  (1)  020276  005737  001126                   TST     $BDDAT
  (1)  020302  001002                           BNE     10$             ;/IF SO EXIT THIS LOOP.
  (1)                                                                   ;/NOTE: WHEN WE DISABLED THE 1 MHZ.
```

```
(1)                                                                  ;/OSC.,THE DIVIDER COULD HAVE
(1)                                                                  ;/AND COUNT LEFT IN IT.
(1)                                                                  ;/AFTER THIS LOOP ,WE SHOULD BE SUNK.
(1)  020304  005200                            INC     R0            ;/DONE 1000. 1MHZ PULSES?
(1)  020306  001354                            BNE     1$            ;/IF NOT - DO ANOTHER.
(1)
(1)  020310  012737  000001  001124   10$:     MOV     #1,$GDDAT     ;/SET FOR ERROR TYPEOUT IF NEEDED.
(1)
(1)                                                                  ;/READ THE COUNTER.
(2)
(2)                                   ;*       MOV     @ACR,$BDDAT   ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
(1)
(1)  020326  023737  001126  001124            CMP     $BDDAT,$GDDAT ;/DID THE COUNTER ADVANCE ONCE?
(1)  020334  001402                            BEQ     2$            ;/IF YES - NEXT CHECK.
(2)
            ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(1)  020336  104012                            ERROR   12            ;/ERROR - CLOCK A - 1KHZ - PULSE
(1)                                                                  ;/NOT GENERATED WHEN 10 10KHZ PULSES
(2)
            ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(1)  020340  000430                            BR      4$
(1)  020342  012700  001747           2$:      MOV     #999.,R0      ;/GET THE NUMBER OF '1 MHZ' H PULSES
(1)
(1)  020346                           3$:                            ;/GENERATE 9 10KHZ PULSES
(2)
(2)                                   ;*       MOV     @ASR,$TMDAT   ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
(1)  020356  052737  004000  001354            BIS     #BIT11,$TMDAT
(2)
(2)                                   ;*       MOV     $TMDAT,@ASR   ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
(1)  020374  005300                            DEC     R0            ;/INORDER TO CHECK TO SEE THAT
(1)  020376  001363                            BNE     3$            ;/WE DON'T GENERATE ANOTHER 1KHZ PULSE.
(1)
(1)                                                                  ;/READ THE COUNTER
(2)
(2)                                   ;*       MOV     @ACR,$BDDAT   ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
(1)  020410  023737  001126  001124            CMP     $BDDAT,$GDDAT ;/WAS ANOTHER 1KHZ PULSE GENERATED?
(1)  020416  001401                            BEQ     4$            ;/NO-GO TO NEXT TEST!
(1)
(2)
            ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(1)  020420  104012                            ERROR   12            ;/ERROR CLOCK A WE SEEM TO HAVE
(1)                                                                  ;/GENERATED A SECOND 1KHZ PULSE
(1)                                                                  ;/ON ONLY 9 10KHZ PULSES.
(2)
            ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

(1)  020422                           4$:
```

```
3261                                    ;/#
 (1)
 (5)                                    ;;*****************************************************************
 (4)                                    ;*TEST 142        *TEST CLOCK A'S 100HZ DIVIDER
 (5)                                    ;*
 (5)                                    ;*IN THIS TEST WE'LL SEE IF THE 100HZ DIVIDER WILL DIVIDE 1KHZ
 (5)                                    ;*BY 10 TO GIVE US A 100HZ CLK L PULSE.
 (5)                                    ;*TO DO THIS, WE'LL DISABLE THE REGULAR 1MHZ CLK PULSE AND
 (5)                                    ;*PULSES THAT IN TURN SHOULD DIVIDE BY TEN TO GIVE US ONE 100HZ
 (5)                                    ;*PULSES.
 (5)                                    ;*THEN WE'LL GENERATE 9 MORE 1KHZ PULSES AND MAKE
 (5)                                    ;*SURE THAT WE DON'T GET ANOTHER 100HZ PULSE.
 (5)                                    ;*
 (6)                                    ;*
 (6)                                    ;* PROBABLE SYNC POINT FOR THIS TEST:: ''LD BUFF A''
 (6)                                    ;*
 (4)                                    ;;*****************************************************************
 (3)  020422  000004                    TST142: SCOPE
 (1)
 (1)                                                                   ;/CLEAR CLOCK B.
 (1)                                                                   ;/CLEAR CLOCK A.
 (1)                                                                   ;/CLEAR A'S BUFFER + COUNT REGS.
 (1)                                                                   ;/DISABLE THE 1MHZ OSC.
 (1)                                                                   ;/ENABLE CNTR, RATE: 100HZ ;MODE.
 (1)
 (1)  020424  005037  001354                    CLR     $TMDAT
 (2)
 (2)                                    ;*      MOV     $TMDAT,@BSR    ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
 (2)
 (2)                                    ;*      MOV     $TMDAT,@ASR    ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
 (2)
 (2)                                    ;*      MOV     $TMDAT,@ABR    ;/ PUT DATA FROM $TMDAT TO DEVICE REG ABR
 (1)  020460  012737  004000  001354            MOV     #BIT11,$TMDAT
 (2)
 (2)                                    ;*      MOV     $TMDAT,@BSR    ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
 (2)
 (2)                                    ;*      MOV     @ASR,$TMDAT    ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
 (1)  020506  052737  000413  001354            BIS     #401!12,$TMDAT
 (2)
 (2)                                    ;*      MOV     $TMDAT,@ASR    ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
 (1)
 (1)                                                                   ;/SET TO GENERATE ON 1MHZ PULSES
 (1)  020524  012700  154360                    MOV     #-10000.,R0
 (1)
 (1)  020530                            1$:                            ;/GENERATE 1 1MHZ PULSE
 (1)                                                                   ;/HAS COUNTER ADVANCED ANY?
 (2)
 (2)                                    ;*      MOV     @ASR,$TMDAT    ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
 (1)  020540  052737  004000  001354            BIS     #BIT11,$TMDAT
 (2)
 (2)                                    ;*      MOV     $TMDAT,@ASR    ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
 (2)
 (2)                                    ;*      MOV     @ACR,$BDDAT    ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
 (1)  020566  005737  001126                    TST     $BDDAT
 (1)  020572  001002                            BNE     10$            ;/IF SO EXIT THIS LOOP.
 (1)                                                                   ;/NOTE: WHEN WE DISABLED THE 1 MHZ.
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  (1)                                                                   ;/OSC.,THE DIVIDER COULD HAVE
  (1)                                                                   ;/AND COUNT LEFT IN IT.
  (1)                                                                   ;/AFTER THIS LOOP ,WE SHOULD BE SUNK.
  (1)  020574  005200                            INC     R0             ;/DONE 10000. 1MHZ PULSES?
  (1)  020576  001354                            BNE     1$             ;/IF NOT - DO ANOTHER.
  (1)
  (1)  020600  012737  000001  001124   10$:     MOV     #1,$GDDAT      ;/SET FOR ERROR TYPEOUT IF NEEDED.
  (1)
  (1)                                                                   ;/READ THE COUNTER.
  (2)
  (2)                                   ;*       MOV     @ACR,$BDDAT    ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
  (1)
  (1)  020616  023737  001126  001124            CMP     $BDDAT,$GDDAT  ;/DID THE COUNTER ADVANCE ONCE?
  (1)  020624  001402                            BEQ     2$             ;/IF YES - NEXT CHECK.
  (2)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (1)  020626  104012                            ERROR   12             ;/ERROR - CLOCK A - 100HZ - PULSE
  (1)                                                                   ;/NOT GENERATED WHEN 10 1KHZ PULSES
  (2)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (1)  020630  000430                            BR      4$
  (1)  020632  012700  023417           2$:      MOV     #9999.,R0      ;/GET THE NUMBER OF '1 MHZ' H PULSES
  (1)
  (1)  020636                           3$:                             ;/GENERATE 9 1KHZ PULSES
  (2)
  (2)                                   ;*       MOV     @ASR,$TMDAT    ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
  (1)  020646  052737  004000  001354            BIS     #BIT11,$TMDAT
  (2)
  (2)                                   ;*       MOV     $TMDAT,@ASR    ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
  (1)  020664  005300                            DEC     R0             ;/INORDER TO CHECK TO SEE THAT
  (1)  020666  001363                            BNE     3$             ;/WE DON'T GENERATE ANOTHER 100HZ PULSE.
  (1)
  (1)                                                                   ;/READ THE COUNTER
  (2)
  (2)                                   ;*       MOV     @ACR,$BDDAT    ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
  (1)  020700  023737  001126  001124            CMP     $BDDAT,$GDDAT  ;/WAS ANOTHER 100HZ PULSE GENERATED?
  (1)  020706  001401                            BEQ     4$             ;/NO-GO TO NEXT TEST!
  (1)
  (2)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (1)  020710  104012                            ERROR   12             ;/ERROR CLOCK A WE SEEM TO HAVE
  (1)                                                                   ;/GENERATED A SECOND 100HZ PULSE
  (1)                                                                   ;/ON ONLY 9 1KHZ PULSES.
  (2)
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (1)  020712                           4$:
 3262
 3361
 3362
  (5)                                   ;;*******************************************************************
  (4)                                   ;*TEST 143      *TEST CLOCK B'S 100KHZ DIVIDER
  (5)                                   ;*
```

```
   (5)                                   ;+IN THIS TEST WE'LL SEE IF THE 100HZ DIVIDER WILL DIVIDE 1KHZ
   (5)                                   ;+BY 10 TO GIVE US A 100HZ CLK L PULSE.
   (5)                                   ;+TO DO THIS, WE'LL DISABLE THE REGULAR 1MHZ CLK PULSE AND
   (5)                                   ;*PULSES THAT IN TURN SHOULD DIVIDE BY TEN TO GIVE US ONE 100HZ
   (5)                                   ;*PULSES.
   (5)                                   ;*THEN WE'LL GENERATE 9 MORE 1KHZ PULSES AND MAKE
   (5)                                   ;*SURE THAT WE DON'T GET ANOTHER 100HZ PULSE.
   (5)                                   ;*
   (6)                                   ;*
   (6)                                   ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD BUFF A"
   (6)                                   ;*
   (4)                                   ;;***************************************************************
   (3)  020712  000004                   TST143: SCOPE
   (1)
   (1)                                                                     ;/CLEAR CLOCK B.
   (1)                                                                     ;/CLEAR CLOCK A.
   (1)
   (1)                                                                     ;/CLEAR B'S BUFFER + COUNT REGS.
   (1)                                                                     ;/DISABLE THE 1MHZ OSC.
   (1)                                                                     ;/RATE: 100KHZ
   (1)                                                                     ;/ENABLE CLOCK B.
   (1)  020714  005037  001354                   CLR     $TMDAT
   (2)
   (2)                                   ;*      MOV     $TMDAT,@BSR         ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
   (2)
   (2)                                   ;*      MOV     $TMDAT,@ASR         ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
   (2)
   (2)                                   ;*      MOV     $TMDAT,@BBR         ;/ PUT DATA FROM $TMDAT TO DEVICE REG BBR
   (1)  020750  012737  004040  001354           MOV     #BIT11!BIT5,$TMDAT
   (2)
   (2)                                   ;*      MOV     $TMDAT,@BSR         ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
   (2)
   (2)                                   ;*      MOV     @BSR,$TMDAT         ;/READ DEVICE REG BSR,PUT DATA IN $TMDAT.
   (1)  020776  052737  000004  001354           BIS     #4,$TMDAT
   (2)
   (2)                                   ;*      MOV     $TMDAT,@BSR         ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
   (1)  021014  005237  001354                   INC     $TMDAT
   (2)
   (2)                                   ;*      MOV     $TMDAT,@BSR         ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
   (1)  021030  012700  177766                   MOV     #-10.,R0            ;/SET TO GENERATE 10. 1MHZ PULSES
   (1)
   (1)  021034                           1$:                                 ;/GENERATE 1 1MHZ PULSE
   (1)                                                                     ;/HAS THE COUNTER ADVANCED?
   (2)
   (2)                                   ;*      MOV     @ASR,$TMDAT         ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
   (1)  021044  052737  004000  001354           BIS     #BIT11,$TMDAT
   (2)
   (2)                                   ;*      MOV     $TMDAT,@ASR         ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
   (2)
   (2)                                   ;*      MOV     @BCR,$BDDAT         ;/READ DEVICE REG BCR,PUT DATA IN $BDDAT.
   (1)  021072  005737  001126                   TST     $BDDAT
   (1)  021076  001002                           BNE     10$                 ;/EXIT LOOP IF SO.
   (1)                                                                     ;/NOTE: WHEN WE DISABLED THE 1 MHZ.
   (1)                                                                     ;/      OSC., THE DIVIDER COULD HAVE
   (1)                                                                     ;/      HAD ANY COUNT IN IT.
   (1)                                                                     ;/AFTER THIS LOOP, WE SHOULD BE SUNK.
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 (1)
 (1)  021100  005200                          INC     R0               ;/DONE 10. 1MHZ PULSES?
 (1)  021102  001354                          BNE     1$               ;/IF NOT - DO ANOTHER.
 (1)
 (1)  021104  012737  000001  001124  10$:    MOV     #1,$GDDAT        ;/SET FOR ERROR TYPEOUT IF NEEDED.
 (1)
 (1)                                                                   ;/READ THE COUNTER
 (2)
 (2)                                  ;*      MOV     @BCR,$BDDAT      ;/READ DEVICE REG BCR,PUT DATA IN $BDDAT.
 (1)
 (1)  021122  023737  001126  001124          CMP     $BDDAT,$GDDAT    ;/DID THE COUNTER ADVANCE ONCE?
 (1)  021130  001402                          BEQ     2$               ;/IF YES - NEXT CHECK
 (2)
          ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (1)  021132  104015                          ERROR   15               ;/ERROR - CLOCK B - 100KHZ - PULSE
 (1)                                                                   ;/NOT GENERATED WHEN 10 1MHZ PULSE
 (1)                                                                   ;/WERE GENERATED.
 (2)
          ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (1)  021134  000430                          BR      4$
 (1)
 (1)  021136  012700  177767          2$:     MOV     #-9.,R0 ;/GET THE NUMBER OF "1 MHZ" H PULSES
 (1)                                                                   ;/NEED TO GIVE 9 1MHZ PULSES
 (1)  021142                          3$:
 (2)
 (2)                                  ;*      MOV     @ASR,$TMDAT      ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
 (1)  021152  052737  004000  001354          BIS     #BIT11,$TMDAT
 (2)
 (2)                                  ;*      MOV     $TMDAT,@ASR      ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
 (1)  021170  005200                          INC     R0               ;/IN ORDER TO CHECK TO SEE THAT
 (1)  021172  001363                          BNE     3$               ;/WE DON'T GENERATE ANOTHER 100KHZ PULSE
 (1)
 (2)
 (2)                                  ;*      MOV     @BCR,$BDDAT      ;/READ DEVICE REG BCR,PUT DATA IN $BDDAT.
 (1)  021204  023737  001126  001124          CMP     $BDDAT,$GDDAT    ;/WAS ANOTHER 100KHZ PULSE GENERATED?
 (1)  021212  001401                          BEQ     4$               ;/NO - GO TO NEXT CHECK.
 (1)
 (2)
          ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (1)  021214  104015                          ERROR   15               ;/ERROR CLOCK B WE SEEM TO HAVE
 (1)                                                                   ;/GENERATED A SECOND 100KHZ PULSE
 (1)                                                                   ;/ON ONLY 9 1MHZ PULSES.
 (2)
          ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (1)  021216                          4$:
 (5)                                  ;;*************************************************************
 (4)                                  ;*TEST 144        *TEST CLOCK B'S 10KHZ DIVIDER
 (5)                                  ;*
 (5)                                  ;+IN THIS TEST WE'LL SEE IF THE 100HZ DIVIDER WILL DIVIDE 1KHZ
 (5)                                  ;+BY 10 TO GIVE US A 100HZ CLK L PULSE.
 (5)                                  ;+TO DO THIS, WE'LL DISABLE THE REGULAR 1MHZ CLK PULSE AND
 (5)                                         ;*PULSES THAT IN TURN SHOULD DIVIDE BY TEN TO GIVE US ONE 100HZ
 (5)                                         ;*PULSES.
 (5)                                         ;*THEN WE'LL GENERATE 9 MORE 1KHZ PULSES AND MAKE
 (5)                                         ;*SURE THAT WE DON'T GET ANOTHER 100HZ PULSE.
 (5)                                         ;*
 (6)                                         ;*
 (6)                                         ;* PROBABLE SYNC POINT FOR THIS TEST:: ''LD BUFF A''
 (6)                                         ;*
 (4)                                         ;;*************************************************************
 (3) 021216  000004                          TST144: SCOPE
 (1)
 (1)                                                                     ;/CLEAR CLOCK B.
 (1)                                                                     ;/CLEAR CLOCK A.
 (1)
 (1)                                                                     ;/CLEAR B'S BUFFER + COUNT REGS.
 (1)                                                                     ;/DISABLE THE 1MHZ OSC.
 (1)                                                                     ;/RATE: 10KHZ
 (1)                                                                     ;/ENABLE CLOCK B.
 (1) 021220  005037  001354                         CLR     $TMDAT
 (2)
 (2)                                         ;*     MOV     $TMDAT,@BSR      ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
 (2)
 (2)                                         ;*     MOV     $TMDAT,@ASR      ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
 (2)
 (2)                                         ;*     MOV     $TMDAT,@BBR      ;/ PUT DATA FROM $TMDAT TO DEVICE REG BBR
 (1) 021254  012737  004040  001354                 MOV     #BIT11!BIT5,$TMDAT
 (2)
 (2)                                         ;*     MOV     $TMDAT,@BSR      ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
 (2)
 (2)                                         ;*     MOV     @BSR,$TMDAT      ;/READ DEVICE REG BSR,PUT DATA IN $TMDAT.
 (1) 021302  052737  000006  001354                 BIS     #6,$TMDAT
 (2)
 (2)                                         ;*     MOV     $TMDAT,@BSR      ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
 (1) 021320  005237  001354                         INC     $TMDAT
 (2)
 (2)                                         ;*     MOV     $TMDAT,@BSR      ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
 (1) 021334  012700  177634                         MOV     #-100.,R0        ;/SET TO GENERATE 100. 1MHZ PULSES
 (1)
 (1) 021340                                  1$:                         ;/GENERATE 1 1MHZ PULSE
 (1)                                                                     ;/HAS THE COUNTER ADVANCED?
 (2)
 (2)                                         ;*     MOV     @ASR,$TMDAT      ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
 (1) 021350  052737  004000  001354                 BIS     #BIT11,$TMDAT
 (2)
 (2)                                         ;*     MOV     $TMDAT,@ASR      ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
 (2)
 (2)                                         ;*     MOV     @BCR,$BDDAT      ;/READ DEVICE REG BCR,PUT DATA IN $BDDAT.
 (1) 021376  005737  001126                         TST     $BDDAT
 (1) 021402  001002                                 BNE     10$              ;/EXIT LOOP IF SO.
 (1)                                                                     ;/NOTE: WHEN WE DISABLED THE 1 MHZ.
 (1)                                                                     ;/      OSC., THE DIVIDER COULD HAVE
 (1)                                                                     ;/      HAD ANY COUNT IN IT.
 (1)                                                                     ;/AFTER THIS LOOP, WE SHOULD BE SUNK.
 (1)
 (1) 021404  005200                                 INC     R0               ;/DONE 100. 1MHZ PULSES?
 (1) 021406  001354                                 BNE     1$               ;/IF NOT - DO ANOTHER.
```

```
  (1)
  (1)  021410  012737  000001  001124  10$:    MOV     #1,$GDDAT        ;/SET FOR ERROR TYPEOUT IF NEEDED.
  (1)
  (1)                                                                   ;/READ THE COUNTER
  (2)
  (2)                                  ;*      MOV     @BCR,$BDDAT      ;/READ DEVICE REG BCR,PUT DATA IN $BDDAT.
  (1)
  (1)  021426  023737  001126  001124          CMP     $BDDAT,$GDDAT    ;/DID THE COUNTER ADVANCE ONCE?
  (1)  021434  001402                          BEQ     2$               ;/IF YES - NEXT CHECK
  (2)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (1)  021436  104015                          ERROR   15               ;/ERROR - CLOCK B - 10KHZ - PULSE
  (1)                                                                   ;/NOT GENERATED WHEN 10 100KHZ PULSE
  (1)                                                                   ;/WERE GENERATED.
  (2)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (1)  021440  000430                          BR      4$
  (1)
  (1)  021442  012700  177635          2$:     MOV     #-99.,R0         ;/GET THE NUMBER OF "1 MHZ" H PULSES
  (1)                                                                   ;/NEED TO GIVE 9 100KHZ PULSES
  (1)  021446                          3$:
  (2)
  (2)                                  ;*      MOV     @ASR,$TMDAT      ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
  (1)  021456  052737  004000  001354          BIS     #BIT11,$TMDAT
  (2)
  (2)                                  ;*      MOV     $TMDAT,@ASR      ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
  (1)  021474  005200                          INC     R0               ;/IN ORDER TO CHECK TO SEE THAT
  (1)  021476  001363                          BNE     3$               ;/WE DON'T GENERATE ANOTHER 10KHZ PULSE
  (1)
  (2)
  (2)                                  ;*      MOV     @BCR,$BDDAT      ;/READ DEVICE REG BCR,PUT DATA IN $BDDAT.
  (1)  021510  023737  001126  001124          CMP     $BDDAT,$GDDAT    ;/WAS ANOTHER 10KHZ PULSE GENERATED?
  (1)  021516  001401                          BEQ     4$               ;/NO - GO TO NEXT CHECK.
  (1)
  (2)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (1)  021520  104015                          ERROR   15               ;/ERROR CLOCK B WE SEEM TO HAVE
  (1)                                                                   ;/GENERATED A SECOND 10KHZ PULSE
  (1)                                                                   ;/ON ONLY 9 100KHZ PULSES.
  (2)
             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (1)  021522                          4$:
 3364
  (5)                                  ;;*******************************************************************
  (4)                                  ;*TEST 145       *TEST CLOCK B'S 1KHZ DIVIDER
  (5)                                  ;*
  (5)                                  ;*IN THIS TEST WE'LL SEE IF THE 100HZ DIVIDER WILL DIVIDE 1KHZ
  (5)                                  ;*BY 10 TO GIVE US A 100HZ CLK L PULSE.
  (5)                                  ;*TO DO THIS, WE'LL DISABLE THE REGULAR 1MHZ CLK PULSE AND
  (5)                                  ;*PULSES THAT IN TURN SHOULD DIVIDE BY TEN TO GIVE US ONE 100HZ
  (5)                                  ;*PULSES.
  (5)                                  ;*THEN WE'LL GENERATE 9 MORE 1KHZ PULSES AND MAKE
  (5)                                   ;*SURE THAT WE DON'T GET ANOTHER 100HZ PULSE.
  (5)                                   ;*
  (6)                                   ;*
  (6)                                   ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD BUFF A"
  (6)                                   ;*
  (4)                                   ;;***************************************************************
  (3)  021522  000004                   TST145: SCOPE
  (1)
  (1)                                                                  ;/CLEAR CLOCK B.
  (1)                                                                  ;/CLEAR CLOCK A.
  (1)
  (1)                                                                  ;/CLEAR B'S BUFFER + COUNT REGS.
  (1)                                                                  ;/DISABLE THE 1MHZ OSC.
  (1)                                                                  ;/RATE: 1KHZ
  (1)                                                                  ;/ENABLE CLOCK B.
  (1)  021524  005037  001354                    CLR     $TMDAT
  (2)
  (2)                                   ;*       MOV     $TMDAT,@BSR       ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
  (2)
  (2)                                   ;*       MOV     $TMDAT,@ASR       ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
  (2)
  (2)                                   ;*       MOV     $TMDAT,@BBR       ;/ PUT DATA FROM $TMDAT TO DEVICE REG BBR
  (1)  021560  012737  004040  001354            MOV     #BIT11!BIT5,$TMDAT
  (2)
  (2)                                   ;*       MOV     $TMDAT,@BSR       ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
  (2)
  (2)                                   ;*       MOV     @BSR,$TMDAT       ;/READ DEVICE REG BSR,PUT DATA IN $TMDAT.
  (1)  021606  052737  000010  001354            BIS     #10,$TMDAT
  (2)
  (2)                                   ;*       MOV     $TMDAT,@BSR       ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
  (1)  021624  005237  001354                    INC     $TMDAT
  (2)
  (2)                                   ;*       MOV     $TMDAT,@BSR       ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
  (1)  021640  012700  176030                    MOV     #-1000.,R0        ;/SET TO GENERATE 1000. 1MHZ PULSES
  (1)
  (1)  021644                           1$:                                ;/GENERATE 1 1MHZ PULSE
  (1)                                                                      ;/HAS THE COUNTER ADVANCED?
  (2)
  (2)                                   ;*       MOV     @ASR,$TMDAT       ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
  (1)  021654  052737  004000  001354            BIS     #BIT11,$TMDAT
  (2)
  (2)                                   ;*       MOV     $TMDAT,@ASR       ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
  (2)
  (2)                                   ;*       MOV     @BCR,$BDDAT       ;/READ DEVICE REG BCR,PUT DATA IN $BDDAT.
  (1)  021702  005737  001126                    TST     $BDDAT
  (1)  021706  001002                            BNE     10$               ;/EXIT LOOP IF SO.
  (1)                                                                      ;/NOTE: WHEN WE DISABLED THE 1 MHZ.
  (1)                                                                      ;/      OSC., THE DIVIDER COULD HAVE
  (1)                                                                      ;/      HAD ANY COUNT IN IT.
  (1)                                                                      ;/AFTER THIS LOOP, WE SHOULD BE SUNK.
  (1)
  (1)  021710  005200                            INC     R0                ;/DONE 1000. 1MHZ PULSES?
  (1)  021712  001354                            BNE     1$                ;/IF NOT - DO ANOTHER.
  (1)
  (1)  021714  012737  000001  001124   10$:     MOV     #1,$GDDAT         ;/SET FOR ERROR TYPEOUT IF NEEDED.
  (1)
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 (1)                                                            ;/READ THE COUNTER
 (2)
 (2)                                    ;*      MOV     @BCR,$BDDAT     ;/READ DEVICE REG BCR,PUT DATA IN $BDDAT.
 (1)
 (1)  021732  023737  001126  001124            CMP     $BDDAT,$GDDAT   ;/DID THE COUNTER ADVANCE ONCE?
 (1)  021740  001402                            BEQ     2$              ;/IF YES - NEXT CHECK
 (2)
          ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (1)  021742  104015                            ERROR   15              ;/ERROR - CLOCK B - 1KHZ - PULSE
 (1)                                                                    ;/NOT GENERATED WHEN 10 10KHZ PULSE
 (1)                                                                    ;/WERE GENERATED.
 (2)
          ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (1)  021744  000430                            BR      4$
 (1)
 (1)  021746  012700  176031            2$:     MOV     #-999.,R0       ;/GET THE NUMBER OF "1 MHZ" H PULSES
 (1)                                                                    ;/NEED TO GIVE 9 10KHZ PULSES
 (1)  021752                            3$:
 (2)
 (2)                                    ;*      MOV     @ASR,$TMDAT     ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
 (1)  021762  052737  004000  001354            BIS     #BIT11,$TMDAT
 (2)
 (2)                                    ;*      MOV     $TMDAT,@ASR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
 (1)  022000  005200                            INC     R0              ;/IN ORDER TO CHECK TO SEE THAT
 (1)  022002  001363                            BNE     3$              ;/WE DON'T GENERATE ANOTHER 1KHZ PULSE
 (1)
 (2)
 (2)                                    ;*      MOV     @BCR,$BDDAT     ;/READ DEVICE REG BCR,PUT DATA IN $BDDAT.
 (1)  022014  023737  001126  001124            CMP     $BDDAT,$GDDAT   ;/WAS ANOTHER 1KHZ PULSE GENERATED?
 (1)  022022  001401                            BEQ     4$              ;/NO - GO TO NEXT CHECK.
 (1)
 (2)
          ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (1)  022024  104015                            ERROR   15              ;/ERROR CLOCK B WE SEEM TO HAVE
 (1)                                                                    ;/GENERATED A SECOND 1KHZ PULSE
 (1)                                                                    ;/ON ONLY 9 10KHZ PULSES.
 (2)
          ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

 (1)  022026                            4$:

                                        ;;*****************************************************************
 (5)                                    ;*TEST 146      *TEST CLOCK B'S 100HZ DIVIDER
 (4)                                    ;*
 (5)                                    ;*IN THIS TEST WE'LL SEE IF THE 100HZ DIVIDER WILL DIVIDE 1KHZ
 (5)                                    ;*BY 10 TO GIVE US A 100HZ CLK L PULSE.
 (5)                                    ;*TO DO THIS, WE'LL DISABLE THE REGULAR 1MHZ CLK PULSE AND
 (5)                                    ;*PULSES THAT IN TURN SHOULD DIVIDE BY TEN TO GIVE US ONE 100HZ
 (5)                                    ;*PULSES.
 (5)                                    ;*THEN WE'LL GENERATE 9 MORE 1KHZ PULSES AND MAKE
 (5)                                    ;*SURE THAT WE DON'T GET ANOTHER 100HZ PULSE.
 (5)                                    ;*
 (6)                                    ;*
 (6)                                          ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD BUFF A"
 (6)                                          ;*
 (4)                                          ;;*************************************************************
 (3)   022026  000004                         TST146: SCOPE
 (1)
 (1)                                                                        ;/CLEAR CLOCK B.
 (1)                                                                        ;/CLEAR CLOCK A.
 (1)
 (1)                                                                        ;/CLEAR B'S BUFFER + COUNT REGS.
 (1)                                                                        ;/DISABLE THE 1MHZ OSC.
 (1)                                                                        ;/RATE: 100HZ
 (1)                                                                        ;/ENABLE CLOCK B.
 (1)   022030  005037  001354                         CLR     $TMDAT
 (2)
 (2)                                          ;*      MOV     $TMDAT,@BSR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
 (2)
 (2)                                          ;*      MOV     $TMDAT,@ASR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
 (2)
 (2)                                          ;*      MOV     $TMDAT,@BBR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG BBR
 (1)   022064  012737  004040  001354                 MOV     #BIT11!BIT5,$TMDAT
 (2)
 (2)                                          ;*      MOV     $TMDAT,@BSR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
 (2)
 (2)                                          ;*      MOV     @BSR,$TMDAT     ;/READ DEVICE REG BSR,PUT DATA IN $TMDAT.
 (1)   022112  052737  000012  001354                 BIS     #12,$TMDAT
 (2)
 (2)                                          ;*      MOV     $TMDAT,@BSR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
 (1)   022130  005237  001354                         INC     $TMDAT
 (2)
 (2)                                          ;*      MOV     $TMDAT,@BSR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
 (1)   022144  012700  154360                         MOV     #-10000.,R0     ;/SET TO GENERATE 10000. 1MHZ PULSES
 (1)
 (1)   022150                                 1$:                             ;/GENERATE 1 1MHZ PULSE
 (1)                                                                        ;/HAS THE COUNTER ADVANCED?
 (2)
 (2)                                          ;*      MOV     @ASR,$TMDAT     ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
 (1)   022160  052737  004000  001354                 BIS     #BIT11,$TMDAT
 (2)
 (2)                                          ;*      MOV     $TMDAT,@ASR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
 (2)
 (2)                                          ;*      MOV     @BCR,$BDDAT     ;/READ DEVICE REG BCR,PUT DATA IN $BDDAT.
 (1)   022206  005737  001126                         TST     $BDDAT
 (1)   022212  001002                                 BNE     10$
                                                                            ;/EXIT LOOP IF SO.
 (1)                                                                        ;/NOTE: WHEN WE DISABLED THE 1 MHZ.
 (1)                                                                        ;/      OSC., THE DIVIDER COULD HAVE
 (1)                                                                        ;/      HAD ANY COUNT IN IT.
 (1)                                                                        ;/AFTER THIS LOOP, WE SHOULD BE SUNK.
 (1)
 (1)   022214  005200                                 INC     R0              ;/DONE 10000. 1MHZ PULSES?
 (1)   022216  001354                                 BNE     1$              ;/IF NOT - DO ANOTHER.
 (1)
 (1)   022220  012737  000001  001124         10$:    MOV     #1,$GDDAT       ;/SET FOR ERROR TYPEOUT IF NEEDED.
 (1)
 (1)                                                                        ;/READ THE COUNTER
 (2)
 (2)                                          ;*      MOV     @BCR,$BDDAT     ;/READ DEVICE REG BCR,PUT DATA IN $BDDAT.
```

```
  (1)
  (1)  022236  023737  001126  001124             CMP     $BDDAT,$GDDAT     ;/DID THE COUNTER ADVANCE ONCE?
  (1)  022244  001402                             BEQ     2$                ;/IF YES - NEXT CHECK
  (2)
           ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (1)  022246  104015                             ERROR   15                ;/ERROR - CLOCK B - 100HZ - PULSE
  (1)                                                                       ;/NOT GENERATED WHEN 10 1KHZ PULSE
  (1)                                                                       ;/WERE GENERATED.
  (2)
           ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (1)  022250  000430                             BR      4$
  (1)
  (1)  022252  012700  154361             2$:     MOV     #-9999.,R0        ;/GET THE NUMBER OF "1 MHZ" H PULSES
  (1)                                                                       ;/NEED TO GIVE 9 1KHZ PULSES
  (1)  022256                             3$:
  (2)
  (2)                                     ;*      MOV     @ASR,$TMDAT       ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
  (1)  022266  052737  004000  001354             BIS     #BIT11,$TMDAT
  (2)
  (2)                                     ;*      MOV     $TMDAT,@ASR       ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
  (1)  022304  005200                             INC     R0                ;/IN ORDER TO CHECK TO SEE THAT
  (1)  022306  001363                             BNE     3$                ;/WE DON'T GENERATE ANOTHER 100HZ PULSE
  (1)
  (2)
  (2)                                     ;*      MOV     @BCR,$BDDAT       ;/READ DEVICE REG BCR,PUT DATA IN $BDDAT.
  (1)  022320  023737  001126  001124             CMP     $BDDAT,$GDDAT     ;/WAS ANOTHER 100HZ PULSE GENERATED?
  (1)  022326  001401                             BEQ     4$                ;/NO - GO TO NEXT CHECK.
  (1)
  (2)
           ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (1)  022330  104015                             ERROR   15                ;/ERROR CLOCK B WE SEEM TO HAVE
  (1)                                                                       ;/GENERATED A SECOND 100HZ PULSE
  (1)                                                                       ;/ON ONLY 9 1KHZ PULSES.
  (2)
           ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

  (1)  022332                             4$:
 3366
 3392
 3393                                             .SBTTL
 3394
 3395                                     .SBTTL  END OF PASS ROUTINE
  (1)
  (2)                                     ;;*****************************************************************
  (1)                                     ;*INCREMENT THE PASS NUMBER ($PASS)
  (1)                                     ;*TYPE "END PASS #XXXXX" (WHERE XXXXX IS A DECIMAL NUMBER)
  (1)                                     ;*IF THERES A MONITOR GO TO IT
  (1)                                     ;*IF THERE ISN'T JUMP TO LOOP
  (1)
  (1)  022332                             $EOP:
  (2)  022332  000240                             NOP
  (1)  022334  005037  001102                     CLR     $TSTNM            ;;ZERO THE TEST NUMBER
  (1)  022340  005237  001206                     INC     $PASS             ;;INCREMENT THE PASS NUMBER
```

```
(1) 022344 042737 100000 001206                 BIC     #100000,$PASS      ;;DON'T ALLOW A NEG. NUMBER
(1) 022352 005327                               DEC     (PC)+              ;;LOOP?
(1) 022354 000001                      $EOPCT:  .WORD   1
(1) 022356 003022                               BGT     $DOAGN             ;;YES
(1) 022360 012737                               MOV     (PC)+,@(PC)+       ;;RESTORE COUNTER
(1) 022362 000001                      $ENDCT:  .WORD   1
(1) 022364 022354                               $EOPCT
(1) 022366 104401 022433                        TYPE    ,$ENDMG            ;;TYPE "END PASS #"
(2) 022372 013746 001206                        MOV     $PASS,-(SP)        ;;SAVE $PASS FOR TYPEOUT
(2) 022376 104405                               TYPDS                      ;;GO TYPE--DECIMAL ASCII WITH SIGN
(1) 022400 104401 022430                        TYPE    ,$ENULL            ;;TYPE A NULL CHARACTER
(1) 022404 013700 000042               $GET42:  MOV     @#42,R0            ;;GET MONITOR ADDRESS
(1) 022410 001405                               BEQ     $DOAGN             ;;BRANCH IF NO MONITOR
(1) 022412 000005                               RESET                      ;;CLEAR THE WORLD
(1) 022414 004710                      $ENDAD:  JSR     PC,(R0)            ;;GO TO MONITOR
(1) 022416 000240                               NOP                        ;;SAVE ROOM
(1) 022420 000240                               NOP                        ;;FOR
(1) 022422 000240                               NOP                        ;;ACT11
(1) 022424                             $DOAGN:
(1) 022424 000137                               JMP     @(PC)+             ;;RETURN
(1) 022426 002334                      $RTNAD:  .WORD   LOOP
(1) 022430    377    377    000        $ENULL:  .BYTE   -1,-1,0            ;;NULL CHARACTER STRING
(1) 022433    015 042412 042116        $ENDMG:  .ASCIZ  <15><12>/END PASS #/
(1) 022440 050040 051501 020123
(1) 022446 000043
                                                .SBTTL  *
                                                .SBTTL  * SPECIAL I/O SIGNAL TESTS
                                                .SBTTL  *



                                       .SBTTL   *       "STP2 OUT" TO "SCHMITT TRIG 1 IN" TESTS
                                                ;*
                                                ;* THIS IS A SPECIAL SECTION DEVOTED FOR TESTING AND
                                                ;* PROVIDING SCOPE LOOP CAPABILITIES FOR "STP2 OUT" L
                                                ;* AND "SCHMITT TRIG 1" IN.
                                                ;*
                                                ;* WHEN YOU LOAD AND START AT LOCATION 210, PROGRAM
                                                ;* CONTROL IS TRANSFERRED HERE. "STP2 OUT" L PULSES ARE
                                                ;* GENERATED BY "LD STAT A HI" H + "BD10" H (MAIN. STP2).
                                                ;* PIN V ("STP2 OUT") IS WIRED TO PIN LL (SCHMITT TRIG1) FOR
                                                ;* THIS TEST. "STP2 OUT" PULSES ARE RECEIVED AS "SCHMITT TRIG 1"
                                                ;* PULSES WHICH SET CLOCK A'S STATUS REGISTER BIT 15.
                                                ;* IF AN ERROR IS DETECTED, NORMAL ERROR REPORTING TECHNIC.
                                                ;* AND ERROR SWITCH REGISTER OPTIONS ARE USED.
                                                ;* AN "*" IS TYPED AFTER EACH 65,324 LOOPS THROUGH THE
                                                ;* TEST. SW13=1 WILL INHIBIT THIS FEATURE.
                                       ;*
(1)                                    ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD STAT B"
(1)                                    ;*
                                                ;*
                                                ;* YOU MUST WIRE PINS V AND LL OF J1 TOGETHER AND INSTALL JUMPER W3
                                                ;*
                                                ;* LOGIC TEST (L + S 200) SHOULD BE RUN FIRST.
                                                ;*
```

```
022450  005037  001664          LS210:  CLR     .DVLS

022454  005037  001104          1$:     CLR     $ICNT           ;/CLEAR ITERATION COUNT
022460  012737  177704  001206          MOV     #-60.,$PASS     ;/SET PASS COUNT.
                                                                ;/NOTE: PASS COUNT USED ONLY
                                                                ;/      TO DETECT 60 PASSES SO
                                                                ;/      IT CAN GENERATE A CRLF.
                                                                ;/      AFTER CRLF IT WILL BE ZEROED.
                                                                ;/CLEAR CLOCK A.
022466                          2$:                             ;/CLEAR CLOCK B.
022466  005037  001354                  CLR     $TMDAT

                                ;*      MOV     $TMDAT,@ASR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR

                                ;*      MOV     $TMDAT,@BSR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR


                                                                ;GENERATE AN "STP2 OUT" PULSE
                                                                ;AT THIS POINT YOU SHOULD
                                                                ;SEE AN OUTPUT AT PIN V.
                                                                ;PIN V SHOULD BE WIRED TO
                                                                ;PIN LL FOR "SCHMITT TRIG 1" IN.


                                ;*      MOV     $TMDAT,@ASR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR

                                ;*      MOV     $TMDAT,@BSR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
022532  052737  002000  001354          BIS     #BIT10,$TMDAT   ;GENERATE STP2

                                ;*      MOV     $TMDAT,@ASR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
022550  000240                          NOP
022552  000240                          NOP

                                ;*      MOV     @ASR,$TMDAT     ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
022564  032737  100000  001354          BIT     #BIT15,$TMDAT   ;IS ST1 FLAG SET <BIT 15>
022572  001001                          BNE     3$              ;BR IF YES TO 3$:


        ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

022574  104000                          ERROR                   ;ERROR "SCHMITT TRIG 1" IN NOT
                                                                ;RECEIVED. HAVE YOU WIRED IT RIGHT?

        ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

022576                          3$:

022576  032777  020000  156334          BIT     #BIT13,@SWR     ;/INHIBIT "*" TYPEOUT?
022604  001330                          BNE     2$              ;/YES - IGNORE ANY UPDATES.

022606  005237  001104                  INC     $ICNT           ;/UPDATE COUNT.
022612  001325                          BNE     2$              ;/IF NOT DONE 65,324 TIMES.
                                                                ;/DO IT AGAIN.

022614  104401  022622                  TYPE    ,65$            ;;TYPE ASCIZ STRING
```

```
022620  000401                          BR      64$                 ;;GET OVER THE ASCIZ
                                ;;65$:  .ASCIZ  #*#
022624                          64$:

022624  005237  001206                  INC     $PASS               ;/DONE 60 PASSES?
022630  100716                          BMI     2$                  ;/NO - NO NEED FOR CR,LF.
022632  104401  022640                  TYPE    ,67$                ;;TYPE ASCIZ STRING
022636  000402                          BR      66$                 ;;GET OVER THE ASCIZ
                                ;;67$:  .ASCIZ  <15><12>##
022644                          66$:
022644  000703                          BR      1$


                                .SBTTL  ;*      "STP1 OUT" TO "SCHMITT TRIG 2" H TESTS
                                        ;*
                                        ;* THIS IS A SPECIAL TEST SECTION DEVOTED FOR TESTING AND
                                        ;* PROVIDING SCOPE LOOP CAPABILITIES FOR "STP1 OUT" AND
                                        ;* "SCHMITT TRIG2" IN.
                                        ;*
                                        ;* WHEN YOU LOAD AND START AT LOCATION 214, PROGRAM
                                        ;* CONTROL IS TRANSFERRED HERE. "STP1 OUT" L PULSES ARE
                                        ;* GENERATED BY "LD STAT A HI" + "BD12" H (MAIN ST1).
                                        ;* PIN DD ("STP1 OUT") IS WIRED TO PIN BB ("SCHMITT
                                        ;* TRIG 2") FOR THIS TEST. "STP1 OUT" PULSES ARE RECEIVED AS
                                        ;* "SCHMITT TRIG 2" PULSES WHICH WILL CLEAR CLOCK A'S
                                        ;* COUNT REGISTER IF MODE 3 IS SELECTED.
                                        ;* IF AN ERROR IS DETECTED, NORMAL ERROR REPORTING TECHNIC.
                                        ;* AND ERROR SWITCH REGISTER OPTIONS ARE USED.
                                        ;* AN "*" IS TYPED AFTER EACH 65,324 LOOPS THROUGH
                                        ;* THE TEST. SW13=1 WILL INHIBIT THIS FEATURE.
                                        ;*
                                ;*
                                ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD STAT B"
                                ;*
                                        ;* YOU MUST WIRE PINS DD AND BB OF J1 TOGETHER AND INSTALL JUMPER W4.
                                        ;*
                                        ;* LOGIC TESTS (L + S AT 200) SHOULD BE RUN FIRST.
                                        ;*

022646  005037  001664          LS214:  CLR     .DVLS

022652  005037  001104          1$:     CLR     $ICNT               ;/CLEAR ITERATION COUNT
022656  012737  177704  001206          MOV     #-60.,$PASS         ;/SET PASS COUNT.
                                                                    ;/NOTE: PASS COUNT USED ONLY
                                                                    ;/       TO DETECT 60 PASSES SO
                                                                    ;/       IT CAN GENERATE A CRLF.
                                                                    ;/       AFTER CRLF IT WILL BE ZEROED.
                                                                    ;/CLEAR CLOCK A.
022664                          2$:                                 ;/CLEAR CLOCK B.
022664  005037  001354                  CLR     $TMDAT

                                ;*      MOV     $TMDAT,@ASR         ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR

                                ;*      MOV     $TMDAT,@BSR         ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR

                                                                    ;LOAD ALL ONES TO CLK A'S BUFFER + COUNT REG.
```

```
                                                                     ;SELECT MODE 3.
                                                                     ;GENERATE A "STP1 OUT" PULSE.
                                                                     ;AT THIS POINT WE SHOULD SEE AN
                                                                     ;OUTPUT AT PIN DD.  PIN DD SHOULD
                                                                     ;BE WIRED TO PIN BB FOR
                                                                     ;"SCHMITT TRIG 2" IN. THIS SHOULD
                                                                     ;CAUSE AN "STP2" WHICH WILL CLEAR
                                                                     ;CLOCK A'S COUNT REGISTER.
      022710  012737  177777  001354           MOV     #-1,$TMDAT

 (1)                                     ;*    MOV     $TMDAT,@ABR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG ABR
      022726  012737  001400  001354           MOV     #BIT8!BIT9,$TMDAT

 (1)                                     ;*    MOV     $TMDAT,@ASR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR

 (1)                                     ;*    MOV     @ASR,$TMDAT     ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
      022754  052737  010000  001354           BIS     #BIT12,$TMDAT

 (1)                                     ;*    MOV     $TMDAT,@ASR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
                                                                     ;WAS THE COUNT REGISTER CLEARED?

 (1)                                     ;*    MOV     @ACR,$BDDAT     ;/READ DEVICE REG ACR,PUT DATA IN $BDDAT.
      023002  005737  001126                   TST     $BDDAT

      023006  001401                           BEQ     3$              ;IF YES BR 3$.

              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

      023010  104000                           ERROR                   ;ERROR "SCHMITT TRIG 2" IN NOT
                                                                     ;RECEIVED. HAVE YOU WIRED IT RIGHT?

              ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

      023012                             3$:

 (1)  023012  032777  020000  156120           BIT     #BIT13,@SWR     ;/INHIBIT "*" TYPEOUT?
 (1)  023020  001321                           BNE     2$              ;/YES - IGNORE ANY UPDATES.
 (1)
 (1)  023022  005237  001104                   INC     $ICNT           ;/UPDATE COUNT.
 (1)  023026  001316                           BNE     2$              ;/IF NOT DONE 65,324 TIMES,
 (1)                                                                 ;/DO IT AGAIN.
 (1)
 (2)  023030  104401  023036                   TYPE    ,65$            ;;TYPE ASCIZ STRING
 (2)  023034  000401                           BR      64$             ;;GET OVER THE ASCIZ
 (2)                                     ;;65$: .ASCIZ  #*#
 (2)  023040                             64$:
 (1)
 (1)  023040  005237  001206                   INC     $PASS           ;/DONE 60 PASSES?
 (1)  023044  100707                           BMI     2$              ;/NO - NO NEED FOR CR,LF.
 (2)  023046  104401  023054                   TYPE    ,67$            ;;TYPE ASCIZ STRING
 (2)  023052  000402                           BR      66$             ;;GET OVER THE ASCIZ
 (2)                                     ;;67$: .ASCIZ  <15><12>##
 (2)  023060                             66$:
 (1)  023060  000674                           BR      1$
 (1)
```

```
                                .SBTTL  *       "SCHMITT TRIG 3" IN, "ST3 OUT" TESTS
                                        ;*
                                        ;*THIS IS A SPECIAL SECTION DEVOTED FOR TESTING AND
                                        ;*PROVIDING SCOPE LOOP CAPABILITIES FOR "SCHMITT TRIG 3"
                                        ;*AND "ST3 OUT".
                                        ;*
                                        ;*WHEN YOU LOAD AND START AT LOCATION 220, PROGRAM
                                        ;*CONTROL IS TRANSFERRED HERE. "STP1" PULSES ARE GENERATED
                                        ;*BY "LD STAT A H," + "BD12" H (MAIN STP1). PIN DD ("STP1 OUT")
                                        ;*IS WIRED TO PIN T ("SCHMITT TRIG 3"), "SCHMITT TRIG 3" PULSES
                                        ;*GIVE US "ST3 OUT" PULSES. PIN L ("ST3 OUT") IS WIRED
                                        ;*TO PIN BB ("SCHMITT TRIG2"), AND "SCHMITT TRIG 2" WILL SET
                                        ;*CLOCK A'S STATUS REGISTER BIT 7.
                                        ;*IF AN ERROR IS DETECTED, NORMAL ERROR REPORTING TECHNIC.
                                        ;*AND ERROR SWITCH REGISTER OPTIONS ARE USED.
                                        ;*AN "*" IS TYPED AFTER EACH 65,324 LOOPS THROUGH THE
                                        ;*TEST. SW13=1 WILL INHIBIT THIS FEATURE.
                                        ;*
                                ;*
                                ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD STAT B"
                                ;*
                                        ;*YOU MUST WIRE PINS DD TO T OF J1 TOGETHER, AS WELL AS
                                        ;*PINS L TO BB OF J1 TOGETHER AND INSTALL JUMPERS W4 AND W5.
                                        ;*
                                        ;*TESTS LS210 AND LS214 SHOULD BE RUN FIRST.
                                        ;*

023062  005037  001664          LS220:  CLR     .DVLS

023066  005037  001104          1$:     CLR     $ICNT           ;/CLEAR ITERATION COUNT
023072  012737  177704  001206          MOV     #-60.,$PASS     ;/SET PASS COUNT.
                                                                ;/NOTE: PASS COUNT USED ONLY
                                                                ;/       TO DETECT 60 PASSES SO
                                                                ;/       IT CAN GENERATE A CRLF.
                                                                ;/       AFTER CRLF IT WILL BE ZEROED.
                                                                ;/CLEAR CLOCK A.
023100                          2$:                             ;/CLEAR CLOCK B.
023100  005037  001354                  CLR     $TMDAT

                                ;*      MOV     $TMDAT,@ASR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR

                                ;*      MOV     $TMDAT,@BSR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR

                                                                ;GENERATE A "STP2 OUT" PULSE.
023124  005037  001354                  CLR     $TMDAT

                                ;*      MOV     @ASR,$TMDAT     ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
023140  052737  011000  001354          BIS     #BIT12!BIT9,$TMDAT

                                ;*      MOV     $TMDAT,@ASR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
                                                                ;AT THIS POINT YOU SHOULD SEE AN
                                                                ;OUTPUT AT PIN DD. PIN DD SHOULD BE
                                                                ;WIRED TO PIN T TO GIVE "SCHMITT TRIG3"
                                                                ;INPUT WHICH IN TURN SHOULD GIVE
                                                                ;AN OUTPUT AT PIN L ("ST3"). PIN
                                                                ;L BEING WIRED TO PIN BB ("SCHMITT
                                                                  ;TRIG2 IN") SHOULD GIVE "ST2" WHICH
                                                                  ;SETS CLOCK A'S CSR BIT 7.

                                                                  ;DID BIT 7 SET?

 (1)                                    ;*      MOV     @ASR,$BDDAT     ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
        023166  105737  001126                  TSTB    $BDDAT
        023172  100401                          BMI     3$              ;IF YES, BR TO 3$.

                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

        023174  104000                          ERROR                   ;ERROR "SCHMITT TRIG 2" NOT RECEIVED
                                                                        ;HAVE YOU WIRED IT RIGHT?

                ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

        023176                          3$:
 (1)    023176  032777  020000  155734          BIT     #BIT13,@SWR     ;/INHIBIT "*" TYPEOUT?
 (1)    023204  001335                          BNE     2$              ;/YES - IGNORE ANY UPDATES.
 (1)
 (1)    023206  005237  001104                  INC     $ICNT           ;/UPDATE COUNT.
 (1)    023212  001332                          BNE     2$              ;/IF NOT DONE 65,324 TIMES,
 (1)                                                                    ;/DO IT AGAIN.
 (1)
 (2)    023214  104401  023222                  TYPE    ,65$            ;;TYPE ASCIZ STRING
 (2)    023220  000401                          BR      64$             ;;GET OVER THE ASCIZ
 (2)                                    ;;65$:  .ASCIZ  #*#
 (2)    023224                          64$:
 (1)
 (1)    023224  005237  001206                  INC     $PASS           ;/DONE 60 PASSES?
 (1)    023230  100723                          BMI     2$              ;/NO - NO NEED FOR CR,LF.
 (2)    023232  104401  023240                  TYPE    ,67$            ;;TYPE ASCIZ STRING
 (2)    023236  000402                          BR      66$             ;;GET OVER THE ASCIZ
 (2)                                    ;;67$:  .ASCIZ  <15><12>##
 (2)    023244                          66$:
 (1)    023244  000710                          BR      1$
 (1)

                                        .SBTTL  *       "A EVENT OUT" TEST
                                                ;*
                                                ;*THIS IS A SPECIAL SECTION DEVOTED FOR TESTING AND
                                                ;*PROVIDING SCOPE LOOP CAPABILITIES FOR "A EVENT OUT".
                                                ;*
                                                ;*WHEN YOU LOAD AND START AT LOCATION 224, PROGRAM
                                                ;*CONTROL IS TRANSFERRED HERE. "A EVENT OUT" PULSES ARE
                                                ;*GENERATED BY CLOCK A OVERFLOWS. PIN VV
                                                ;*("A EVENT OUT") IS WIRED TO PIN BB ("SCHMITT TRIG 2")
                                                ;*"SCHMITT TRIG 2" PULSES WILL SET CLOCK A'S CSR BIT 7.
                                                ;*IF AN ERROR IS DETECTED, NORMAL ERROR REPORTING
                                                ;*AND ERROR SWITCH REGISTER OPTIONS ARE USED.
                                                ;*AN "*" IS TYPED AFTER EACH 65,324 LOOPS THROUGH THE TEST.
                                                ;*SW13=1 WILL INHIBIT THIS FEATURE.
                                                ;*
                                        ;*
 (1)                                    ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD STAT B"
```

```
  (1)                                   ;*
 3606                                           ;*YOU MUST WIRE PINS VV AND BB OF J1 TOGETHER AND INSTALL JUMPER W4.
 3607                                           ;*
 3608                                           ;*TEST LS210 SHOULD BE RUN FIRST.
 3609                                           ;*
 3610
 3611  023246  005037  001664          LS224:   CLR     .DVLS
 3612
  (1)  023252  005037  001104          1$:      CLR     $ICNT           ;/CLEAR ITERATION COUNT
  (1)  023256  012737  177704  001206           MOV     #-60.,$PASS     ;/SET PASS COUNT.
  (1)                                                                   ;/NOTE: PASS COUNT USED ONLY
  (1)                                                                   ;/      TO DETECT 60 PASSES SO
  (1)                                                                   ;/      IT CAN GENERATE A CRLF.
  (1)                                                                   ;/      AFTER CRLF IT WILL BE ZEROED.
  (1)                                                                   ;/CLEAR CLOCK A.
  (1)  023264                          2$:                              ;/CLEAR CLOCK B.
  (1)  023264  005037  001354                   CLR     $TMDAT
  (2)
  (2)                                   ;*      MOV     $TMDAT,@ASR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
  (2)
  (2)                                   ;*      MOV     $TMDAT,@BSR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
  (1)
 3613                                                                   ;PRELOAD CLOCK A'S BUFFER + COUNT REGS.
 3614  023310  012737  177777  001354           MOV     #-1,$TMDAT
 3615
  (1)                                   ;*      MOV     $TMDAT,@ABR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG ABR
 3616
 3617                                                                   ;RATE: 1MHZ, ENABLE COUNTER
 3618  023326  012737  001003  001354           MOV     #1003,$TMDAT
 3619
  (1)                                   ;*      MOV     $TMDAT,@ASR     ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
 3620
 3621  023344                          3$:                              ;HAS AN OVERFLOW OCCURRED?
 3622
  (1)                                   ;*      MOV     @ASR,$TMDAT     ;/READ DEVICE REG ASR,PUT DATA IN $TMDAT.
 3623  023354  032737  000040  001354           BIT     #BIT05,$TMDAT
 3624  023362  001770                           BEQ     3$              ;NO - THEN WAIT FOR IT.
 3625                                                                   ;OVERFLOW SHOULD GO OUT AS
 3626                                                                   ;"A EVENT OUT". YOU SHOULD SEE
 3627                                                                   ;AN OUTPUT AT PIN VV.
 3628                                                                   ;THIS IN TURN IS BROUGHT
 3629                                                                   ;IN AS "SCHMITT TRIG 2" IN TO
 3630                                                                   ;SET CLOCK A'S CSR BIT 7.
 3631
 3632
  (1)                                   ;*      MOV     @ASR,$BDDAT     ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
 3633  023374  105737  001126                   TSTB    $BDDAT          ;DID BIT 7 SET
 3634  023400  100401                           BMI     4$              ;BR IF YES TO 4$
 3635
               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$

 3636  023402  104000                           ERROR                   ;ERROR "A EVENT OUT" PULSE
 3637                                                                   ;NOT DETECTED. HAVE YOU
 3638                                                                   ;WIRED IT RIGHT?
 3639

               ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$
```

```
      023404                                    4$:
 (1)  023404  032777  020000  155526                    BIT     #BIT13,@SWR             ;/INHIBIT "*" TYPEOUT?
 (1)  023412  001324                                    BNE     2$                      ;/YES - IGNORE ANY UPDATES.
 (1)
 (1)  023414  005237  001104                            INC     $ICNT                   ;/UPDATE COUNT.
 (1)  023420  001321                                    BNE     2$                      ;/IF NOT DONE 65,324 TIMES,
 (1)                                                                                    ;/DO IT AGAIN.
 (1)
 (2)  023422  104401  023430                            TYPE    ,65$                    ;;TYPE ASCIZ STRING
 (2)  023426  000401                                    BR      64$                     ;;GET OVER THE ASCIZ
 (2)                                            ;;65$:  .ASCIZ  #*#
 (2)  023432                                    64$:
 (1)
 (1)  023432  005237  001206                            INC     $PASS                   ;/DONE 60 PASSES?
 (1)  023436  100712                                    BMI     2$                      ;/NO - NO NEED FOR CR,LF.
 (2)  023440  104401  023446                            TYPE    ,67$                    ;;TYPE ASCIZ STRING
 (2)  023444  000402                                    BR      66$                     ;;GET OVER THE ASCIZ
 (2)                                            ;;67$:  .ASCIZ  <15><12>##
 (2)  023452                                    66$:
 (1)  023452  000677                                    BR      1$
 (1)

                                                .SBTTL  *       "B EVENT OUT" TEST
                                                        ;*
                                                        ;*THIS IS A SPECIAL SECTION DEVOTED FOR TESTING AND
                                                        ;*PROVIDING SCOPE LOOP CAPABILITIES FOR 'B EVENT OUT".
                                                        ;*
                                                        ;*WHEN YOU LOAD AND START AT LOCATION 230, PROGRAM
                                                        ;*CONTROL IS TRANSFERRED HERE. "B EVENT OUT" PULSES ARE
                                                        ;*GENERATED BY CLOCK B OVERFLOWS. PIN TT
                                                        ;*("B EVENT OUT") IS WIRED TO PIN BB ("SCHMITT TRIG 2")
                                                        ;*"SCHMITT TRIG 2" PULSES WILL SET CLOCK A'S CSR BIT 7.
                                                        ;*IF AN ERROR IS DETECTED, NORMAL ERROR REPORTING TECHNIQ.
                                                        ;*AND ERROR SWITCH REGISTER OPTIONS ARE USED.
                                                        ;*AN "*" IS TYPED AFTER EACH 65,324 LOOPS THROUGH THE TEST.
                                                        ;*SW13=1 WILL INHIBIT THIS FEATURE.
                                                        ;*
                                                ;*
 (1)                                            ;* PROBABLE SYNC POINT FOR THIS TEST:: "LD BUFF B"
 (1)                                            ;*
                                                        ;*YOU MUST WIRE PINS TT AND BB OF J1 TOGETHER AND INSTALL JUMPER W4.
                                                        ;*
                                                        ;*TEST LS210 SHOULD BE RUN FIRST.
                                                        ;*

      023454  005037  001664                    LS230:  CLR     .DVLS

 (1)  023460  005037  001104                    1$:     CLR     $ICNT                   ;/CLEAR ITERATION COUNT
 (1)  023464  012737  177704  001206                    MOV     #-60.,$PASS             ;/SET PASS COUNT.
 (1)                                                                                    ;/NOTE: PASS COUNT USED ONLY
 (1)                                                                                    ;/      TO DETECT 60 PASSES SO
 (1)                                                                                    ;/      IT CAN GENERATE A CRLF.
 (1)                                                                                    ;/      AFTER CRLF IT WILL BE ZEROED.
 (1)                                                                                    ;/CLEAR CLOCK A.
```

```
(1)  023472                          2$:                                 ;/CLEAR CLOCK B.
(1)  023472  005037  001354                  CLR     $TMDAT
(2)
(2)                                  ;*      MOV     $TMDAT,@ASR         ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR
(2)
(2)                                  ;*      MOV     $TMDAT,@BSR         ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
(1)
                                                                         ;PRELOAD CLOCK B'S BUFFER + COUNT REGS.
     023516  012737  177777  001354          MOV     #-1,$TMDAT

(1)                                  ;*      MOV     $TMDAT,@BBR         ;/ PUT DATA FROM $TMDAT TO DEVICE REG BBR
     023534  012737  001000  001354          MOV     #1000,$TMDAT

(1)                                  ;*      MOV     $TMDAT,@ASR         ;/ PUT DATA FROM $TMDAT TO DEVICE REG ASR

                                                                         ;RATE: 1MHZ, ENABLE COUNTER


                                                                         ;HAS AN OVERFLOW OCCURRED?
     023552  012737  000003  001354          MOV     #3,$TMDAT

(1)                                  ;*      MOV     $TMDAT,@BSR         ;/ PUT DATA FROM $TMDAT TO DEVICE REG BSR
     023570                          3$:
(1)
(1)                                  ;*      MOV     @BSR,$TMDAT         ;/READ DEVICE REG BSR,PUT DATA IN $TMDAT.
     023600  032737  000200  001354          BIT     #BIT07,$TMDAT
     023606  001770                          BEQ     3$                  ;NO -THEN WAIT FOR IT.
                                                                         ;OVERFLOW SHOULD GO OUT AS
                                                                         ;"B EVENT OUT". YOU SHOULD SEE
                                                                         ;AN OUTPUT AT PIN TT.
                                                                         ;THIS IN TURN IS BROUGHT
                                                                         ;IN AS "SCHMITT TRIG 2" IN TO
                                                                         ;SET CLOCK A'S CSR BIT 7.


(1)                                  ;*      MOV     @ASR,$BDDAT         ;/READ DEVICE REG ASR,PUT DATA IN $BDDAT.
     023620  105737  001126                  TSTB    $BDDAT              ;DID BIT 7 SET
     023624  100401                          BMI     4$                  ;BR IF YES TO 4$

             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

     023626  104000                          ERROR                       ;ERROR "B EVENT OUT" PULSE
                                                                         ;NOT DETECTED. HAVE YOU
                                                                         ;WIRED IT RIGHT?

             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$$

     023630                          4$:

(1)  023630  032777  020000  155302          BIT     #BIT13,@SWR         ;/INHIBIT "*" TYPEOUT?
(1)  023636  001315                          BNE     2$                  ;/YES - IGNORE ANY UPDATES.
(1)
(1)  023640  005237  001104                  INC     $ICNT               ;/UPDATE COUNT.
(1)  023644  001312                          BNE     2$                  ;/IF NOT DONE 65,324 TIMES,
(1)                                                                      ;/DO IT AGAIN.
(1)
(2)  023646  104401  023654                  TYPE    ,65$                ;;TYPE ASCIZ STRING
```

```
 (2)  023652  000401                           BR      64$                ;;GET OVER THE ASCIZ
 (2)                               ;;65$:      .ASCIZ  #*#
 (2)  023656                       64$:
 (1)
 (1)  023656  005237  001206                   INC     $PASS              ;/DONE 60 PASSES?
 (1)  023662  100703                           BMI     2$                 ;/NO - NO NEED FOR CR,LF.
 (2)  023664  104401  023672                   TYPE    ,67$               ;;TYPE ASCIZ STRING
 (2)  023670  000402                           BR      66$                ;;GET OVER THE ASCIZ
 (2)                               ;;67$:      .ASCIZ  <15><12>##
 (2)  023676                       66$:
 (1)  023676  000670                           BR      1$
 (1)

                                   ;*ROUTINE TO HANDLE TRAPS TO LOC 4, 10 AND .
                                   ;*INTERRUPTS TO WRONG VECTORS.
                                   ;*.+2, IOTT(TRAPS) WERE PUT IN LOCATIONS 4-1000


      023700                       IOTRD:
      023700  011637  024050                   MOV     (R6),2$            ;GET WHERE WE TRAPPED TO.
      023704  162737  000004  024050           SUB     #4,2$              ;=WHERE R6 RETURN 10-4
      023712  104401  023720                   TYPE    ,65$               ;;TYPE ASCIZ STRING
 (1)  023716  000412                           BR      64$                ;;GET OVER THE ASCIZ
 (1)                               ;;65$:      .ASCIZ  <15><12>#ILLEGAL TRAP TO: #
 (1)  023744                       64$:

      023744  013746  024050                   MOV     2$,-(SP)           ;;SAVE 2$ FOR TYPEOUT
 (1)  023750  104402                           TYPOC                      ;;GO TYPE--OCTAL ASCII(ALL DIGITS)

      023752  104401  023760                   TYPE    ,67$               ;;TYPE ASCIZ STRING
 (1)  023756  000407                           BR      66$                ;;GET OVER THE ASCIZ
 (1)                               ;;67$:      .ASCIZ  # FROM LOC.: #
 (1)  023776                       66$:

      023776  062706  000004                   ADD     #4,R6              ;POINT TO WHERE WE TRAPPED FROM.

      024002  011637  024052                   MOV     (R6),3$            ;PICK UP LOC
      024006  162737  000002  024052           SUB     #2,3$              ;FROM REAL ADDR.
      024014  013746  024052                   MOV     3$,-(SP)           ;;SAVE 3$ FOR TYPEOUT
 (1)  024020  104402                           TYPOC                      ;;GO TYPE--OCTAL ASCII(ALL DIGITS)

      024022  023727  024050  000004           CMP     2$,#4              ;DID WE TRAP TO LOC 4?
      024030  001405                           BEQ     1$                 ;IF SO - DON'T RETURN!
      024032  023727  024050  000010           CMP     2$,#10             ;DID WE TRAP TO LOC. 10?
      024040  001401                           BEQ     1$                 ;ID SO - DON'T RETURN!
      024042  000002                           RTI                        ;TRY RETURNING.


             ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

      024044  000000               1$:         HALT                       ;WE STOPPED HERE BECAUSE WE TRAPPED
      024046  000776                           BR      1$                 ;TO LOC 4 OR LOC 10.  THIS IS A
                                                                          ;FATAL CONDITION THAT WE CAN NOT
                                                                          ;RECOVER FROM.


```

```
          ;;;$$$$$$$$$$$$$$$$$$$$$$$$$$$>> ERROR <<$$$$$$$$$$$$$$$$$$$$$$$$$$$

      024050  000000                      2$:     .WORD   0                       ;USED BY IOTRP TO STORE WHERE WE TRAPPED TO.
      024052  000000                      3$:     .WORD   0                       ;USED BY IOTRP TO STORE WHERE WE TRAPPED FROM.
                                                  .SBTTL
                                                  .SBTTL  *SYSMAC ROUTINES
                                                  .SBTTL

                                          .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
  (1)
  (2)                                     ;;*************************************************************
  (1)                                     ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
  (1)                                     ;*OCTAL (ASCII) NUMBER AND TYPE IT.
  (1)                                     ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
  (1)                                     ;*CALL:
  (1)                                     ;*      MOV     NUM,-(SP)               ;;NUMBER TO BE TYPED
  (1)                                     ;*      TYPOS                           ;;CALL FOR TYPEOUT
  (1)                                     ;*      .BYTE   N                       ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
  (1)                                     ;*      .BYTE   M                       ;;M=1 OR 0
  (1)                                     ;*                                              ;;1=TYPE LEADING ZEROS
  (1)                                     ;*                                              ;;0=SUPPRESS LEADING ZEROS
  (1)                                     ;*
  (1)                                     ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
  (1)                                     ;*$TYPOS OR $TYPOC
  (1)                                     ;*CALL:
  (1)                                     ;*      MOV     NUM,-(SP)               ;;NUMBER TO BE TYPED
  (1)                                     ;*      TYPON                           ;;CALL FOR TYPEOUT
  (1)                                     ;*
  (1)                                     ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
  (1)                                     ;*CALL:
  (1)                                     ;*      MOV     NUM,-(SP)               ;;NUMBER TO BE TYPED
  (1)                                     ;*      TYPOC                           ;;CALL FOR TYPEOUT
  (1)
  (1)  024054  017646  000000             $TYPOS: MOV     @(SP),-(SP)             ;;PICKUP THE MODE
  (1)  024060  116637  000001  024277             MOVB    1(SP),$0FILL            ;;LOAD ZERO FILL SWITCH
  (1)  024066  112637  024301                     MOVB    (SP)+,$0MODE+1          ;;NUMBER OF DIGITS TO TYPE
  (1)  024072  062716  000002                     ADD     #2,(SP)                 ;;ADJUST RETURN ADDRESS
  (1)  024076  000406                             BR      $TYPON
  (1)  024100  112737  000001  024277     $TYPOC: MOVB    #1,$0FILL               ;;SET THE ZERO FILL SWITCH
  (1)  024106  112737  000006  024301             MOVB    #6,$0MODE+1             ;;SET FOR SIX(6) DIGITS
  (1)  024114  112737  000005  024276     $TYPON: MOVB    #5,$0CNT                ;;SET THE ITERATION COUNT
  (1)  024122  010346                             MOV     R3,-(SP)                ;;SAVE R3
  (1)  024124  010446                             MOV     R4,-(SP)                ;;SAVE R4
  (1)  024126  010546                             MOV     R5,-(SP)                ;;SAVE R5
  (1)  024130  113704  024301                     MOVB    $0MODE+1,R4             ;;GET THE NUMBER OF DIGITS TO TYPE
  (1)  024134  005404                             NEG     R4
  (1)  024136  062704  000006                     ADD     #6,R4                   ;;SUBTRACT IT FOR MAX. ALLOWED
  (1)  024142  110437  024300                     MOVB    R4,$0MODE               ;;SAVE IT FOR USE
  (1)  024146  113704  024277                     MOVB    $0FILL,R4               ;;GET THE ZERO FILL SWITCH
  (1)  024152  016605  000012                     MOV     12(SP),R5               ;;PICKUP THE INPUT NUMBER
  (1)  024156  005003                             CLR     R3                      ;;CLEAR THE OUTPUT WORD
  (1)  024160  006105                     1$:     ROL     R5                      ;;ROTATE MSB INTO "C"
  (1)  024162  000404                             BR      3$                      ;;GO DO MSB
  (1)  024164  006105                     2$:     ROL     R5                      ;;FORM THIS DIGIT
  (1)  024166  006105                             ROL     R5
  (1)  024170  006105                             ROL     R5
```

```
    (1)  024172  010503                               MOV     R5,R3
    (1)  024174  006103                      3$:      ROL     R3                 ;;GET LSB OF THIS DIGIT
    (1)  024176  105337  024300                       DECB    $OMODE             ;;TYPE THIS DIGIT?
    (1)  024202  100016                               BPL     7$                 ;;BR IF NO
    (1)  024204  042703  177770                       BIC     #177770,R3         ;;GET RID OF JUNK
    (1)  024210  001002                               BNE     4$                 ;;TEST FOR 0
    (1)  024212  005704                               TST     R4                 ;;SUPPRESS THIS 0?
    (1)  024214  001403                               BEQ     5$                 ;;BR IF YES
    (1)  024216  005204                      4$:      INC     R4                 ;;DON'T SUPPRESS ANYMORE 0'S
    (1)  024220  052703  000060                       BIS     #'0,R3             ;;MAKE THIS DIGIT ASCII
    (1)  024224  052703  000040              5$:      BIS     #' ,R3             ;;MAKE ASCII IF NOT ALREADY
    (1)  024230  110337  024274                       MOVB    R3,8$              ;;SAVE FOR TYPING
    (1)  024234  104401  024274                       TYPE    ,8$                ;;GO TYPE THIS DIGIT
    (1)  024240  105337  024276              7$:      DECB    $OCNT              ;;COUNT BY 1
    (1)  024244  003347                               BGT     2$                 ;;BR IF MORE TO DO
    (1)  024246  002402                               BLT     6$                 ;;BR IF DONE
    (1)  024250  005204                               INC     R4                 ;;INSURE LAST DIGIT ISN'T A BLANK
    (1)  024252  000744                               BR      2$                 ;;GO DO THE LAST DIGIT
    (1)  024254  012605                      6$:      MOV     (SP)+,R5           ;;RESTORE R5
    (1)  024256  012604                               MOV     (SP)+,R4           ;;RESTORE R4
    (1)  024260  012603                               MOV     (SP)+,R3           ;;RESTORE R3
    (1)  024262  016666  000002  000004               MOV     2(SP),4(SP)        ;;SET THE STACK FOR RETURNING
    (1)  024270  012616                               MOV     (SP)+,(SP)
    (1)  024272  000002                               RTI                        ;;RETURN
    (1)  024274     000                      8$:      .BYTE   0                  ;;STORAGE FOR ASCII DIGIT
    (1)  024275     000                               .BYTE   0                  ;;TERMINATOR FOR TYPE ROUTINE
    (1)  024276     000                      $OCNT:   .BYTE   0                  ;;OCTAL DIGIT COUNTER
    (1)  024277     000                      $OFILL:  .BYTE   0                  ;;ZERO FILL SWITCH
    (1)  024300  000000                      $OMODE:  .WORD   0                  ;;NUMBER OF DIGITS TO TYPE
  3738                                       .SBTTL  ERROR HANDLER ROUTINE
    (1)
    (2)                                      ;;*******************************************************************
    (1)                                      ;*THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
    (1)                                      ;*SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
    (1)                                      ;*AND GO TO $ERRTYP ON ERROR
    (1)                                      ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
    (1)                                      ;*SW15=1         HALT ON ERROR
    (1)                                      ;*SW13=1         INHIBIT ERROR TYPEOUTS
    (1)                                      ;*SW10=1         BELL ON ERROR
    (1)                                      ;*SW09=1         LOOP ON ERROR
    (1)                                      ;*CALL
    (1)                                      ;*       ERROR   N       ;;ERROR=EMT AND N=ERROR ITEM NUMBER
    (1)
    (1)  024302                              $ERROR:
    (1)  024302  104407                               CKSWR                      ;;TEST FOR CHANGE IN SOFT-SWR
    (1)  024304  105237  001103              7$:      INCB    $ERFLG             ;;SET THE ERROR FLAG
    (1)  024310  001775                               BEQ     7$                 ;;DON'T LET THE FLAG GO TO ZERO
    (1)  024312  013777  001102  154622               MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER AND ERROR FLAG
    (1)  024320  032777  002000  154612               BIT     #BIT10,@SWR        ;;BELL ON ERROR?
    (1)  024326  001402                               BEQ     1$                 ;;NO - SKIP
    (1)  024330  104401  001170                       TYPE    ,$BELL             ;;RING BELL
    (1)  024334  005237  001112              1$:      INC     $ERTTL             ;;COUNT THE NUMBER OF ERRORS
    (1)  024340  011637  001116                       MOV     (SP),$ERRPC        ;;GET ADDRESS OF ERROR INSTRUCTION
    (1)  024344  162737  000002  001116               SUB     #2,$ERRPC
    (1)  024352  117737  154540  001114               MOVB    @$ERRPC,$ITEMB  ;;STRIP AND SAVE THE ERROR ITEM CODE
    (1)  024360  032777  020000  154552               BIT     #BIT13,@SWR        ;;SKIP TYPEOUT IF SET
```

```
   (1)  024366  001004                            BNE     20$               ;;SKIP TYPEOUTS
   (1)  024370  004737  024502                    JSR     PC,$ERRTYP        ;;GO TO USER ERROR ROUTINE
   (1)  024374  104401  001175                    TYPE    ,$CRLF
   (1)  024400                            20$:
   (1)  024400  122737  000001  001220            CMPB    #APTENV,$ENV      ;;RUNNING IN APT MODE
   (1)  024406  001007                            BNE     2$                ;;NO,SKIP APT ERROR REPORT
   (1)  024410  113737  001114  024422            MOVB    $ITEMB,21$        ;;SET ITEM NUMBER AS ERROR NUMBER
   (1)  024416  004737  026432                    JSR     PC,$ATY4          ;;REPORT FATAL ERROR TO APT
   (1)  024422     000                    21$:    .BYTE   0
   (1)  024423     000                            .BYTE   0
   (1)  024424  000777                    22$:    BR      22$               ;;APT ERROR LOOP
   (1)  024426  005777  154506            2$:     TST     @SWR              ;;HALT ON ERROR
   (1)  024432  100002                            BPL     3$                ;;SKIP IF CONTINUE
   (1)  024434  000000                            HALT                      ;;HALT ON ERROR!
   (1)  024436  104407                            CKSWR                     ;;TEST FOR CHANGE IN SOFT-SWR
   (1)  024440  032777  001000  154472    3$:     BIT     #BIT09,@SWR       ;;LOOP ON ERROR SWITCH SET?
   (1)  024446  001402                            BEQ     4$                ;;BR IF NO
   (1)  024450  013716  001110                    MOV     $LPERR,(SP)       ;;FUDGE RETURN FOR LOOPING
   (1)  024454  005737  001166            4$:     TST     $ESCAPE           ;;CHECK FOR AN ESCAPE ADDRESS
   (1)  024460  001402                            BEQ     5$                ;;BR IF NONE
   (1)  024462  013716  001166                    MOV     $ESCAPE,(SP)      ;;FUDGE RETURN ADDRESS FOR ESCAPE
   (1)  024466                            5$:
   (1)  024466  022737  022414  000042            CMP     #$ENDAD,@#42      ;;ACT-11 AUTO-ACCEPT?
   (1)  024474  001001                            BNE     6$                ;;BRANCH IF NO
   (1)  024476  000000                            HALT                      ;;YES
   (1)  024500                            6$:
   (1)  024500  000002                            RTI                       ;;RETURN
3739                                      .SBTTL  ERROR MESSAGE TYPEOUT ROUTINE
   (1)
   (2)                                    ;;*******************************************************************
   (1)                                    ;*THIS ROUTINE USES THE "ITEM CONTROL BYTE" ($ITEMB) TO DETERMINE WHICH
   (1)                                    ;*ERROR IS TO BE REPORTED. IT THEN OBTAINS, FROM THE "ERROR TABLE" ($ERRTB),
   (1)                                    ;*AND REPORTS THE APPROPRIATE INFORMATION CONCERNING THE ERROR.
   (1)
   (1)  024502                            $ERRTYP:
   (1)  024502  104401  001175                    TYPE    ,$CRLF            ;;"CARRIAGE RETURN" & "LINE FEED"
   (1)  024506  010046                            MOV     R0,-(SP)          ;;SAVE R0
   (1)  024510  005000                            CLR     R0                ;;PICKUP THE ITEM INDEX
   (1)  024512  153700  001114                    BISB    @#$ITEMB,R0
   (1)  024516  001004                            BNE     1$                ;;IF ITEM NUMBER IS ZERO, JUST
   (1)                                                                      ;;TYPE THE PC OF THE ERROR
   (2)  024520  013746  001116                    MOV     $ERRPC,-(SP)      ;;SAVE $ERRPC FOR TYPEOUT
   (2)                                                                      ;;ERROR ADDRESS
   (2)  024524  104402                            TYPOC                     ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
   (1)  024526  000426                            BR      6$                ;;GET OUT
   (1)  024530  005300                    1$:     DEC     R0                ;;ADJUST THE INDEX SO THAT IT WILL
   (1)  024532  006300                            ASL     R0                ;;      WORK FOR THE ERROR TABLE
   (1)  024534  006300                            ASL     R0
   (1)  024536  006300                            ASL     R0
   (1)  024540  062700  001356                    ADD     #$ERRTB,R0        ;;FORM TABLE POINTER
   (1)  024544  012037  024554                    MOV     (R0)+,2$          ;;PICKUP "ERROR MESSAGE" POINTER
   (1)  024550  001404                            BEQ     3$                ;;SKIP TYPEOUT IF NO POINTER
   (1)  024552  104401                            TYPE                      ;;TYPE THE "ERROR MESSAGE"
   (1)  024554  000000                    2$:     .WORD   0                 ;;"ERROR MESSAGE" POINTER GOES HERE
   (1)  024556  104401  001175                    TYPE    ,$CRLF            ;;"CARRIAGE RETURN" & "LINE FEED"
   (1)  024562  012037  024572            3$:     MOV     (R0)+,4$          ;;PICKUP "DATA HEADER" POINTER
   (1)  024566  001404                           BEQ     5$                      ;;SKIP TYPEOUT IF 0
   (1)  024570  104401                           TYPE                            ;;TYPE THE "DATA HEADER"
   (1)  024572  000000                   4$:     .WORD   0                       ;;"DATA HEADER" POINTER GOES HERE
   (1)  024574  104401  001175                   TYPE    ,$CRLF                  ;;"CARRIAGE RETURN" & "LINE FEED"
   (1)  024600  011000                   5$:     MOV     (R0),R0                 ;;PICKUP "DATA TABLE" POINTER
   (1)  024602  001004                           BNE     7$                      ;;GO TYPE THE DATA
   (1)  024604  012600                   6$:     MOV     (SP)+,R0                ;;RESTORE R0
   (1)  024606  104401  001175                   TYPE    ,$CRLF                  ;;"CARRIAGE RETURN" & "LINE FEED"
   (1)  024612  000207                           RTS     PC                      ;;RETURN
   (1)  024614                           7$:
   (2)  024614  013046                           MOV     @(R0)+,-(SP)            ;;SAVE @(R0)+ FOR TYPEOUT
   (2)  024616  104402                           TYPOC                           ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
   (1)  024620  005710                           TST     (R0)                    ;;IS THERE ANOTHER NUMBER?
   (1)  024622  001770                           BEQ     6$                      ;;BR IF NO
   (1)  024624  104401  024632                   TYPE    ,8$                     ;;TYPE TWO(2) SPACES
   (1)  024630  000771                           BR      7$                      ;;LOOP
   (1)  024632  020040     000           8$:     .ASCIZ  /  /                    ;;TWO(2) SPACES
   (1)          024636                           .EVEN
  3740                                   .SBTTL  CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
   (1)
   (2)                                   ;;*******************************************************************
   (1)                                   ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 5-DIGIT
   (1)                                   ;*SIGNED DECIMAL (ASCII) NUMBER AND TYPE IT. DEPENDING ON WHETHER THE
   (1)                                   ;*NUMBER IS POSITIVE OR NEGATIVE A SPACE OR A MINUS SIGN WILL BE TYPED
   (1)                                   ;*BEFORE THE FIRST DIGIT OF THE NUMBER. LEADING ZEROS WILL ALWAYS BE
   (1)                                   ;*REPLACED WITH SPACES.
   (1)                                   ;*CALL:
   (1)                                   ;*      MOV     NUM,-(SP)               ;;PUT THE BINARY NUMBER ON THE STACK
   (1)                                   ;*      TYPDS                           ;;GO TO THE ROUTINE
   (1)
   (1)  024636                           $TYPDS:
   (3)  024636  010046                           MOV     R0,-(SP)                ;;PUSH R0 ON STACK
   (3)  024640  010146                           MOV     R1,-(SP)                ;;PUSH R1 ON STACK
   (3)  024642  010246                           MOV     R2,-(SP)                ;;PUSH R2 ON STACK
   (3)  024644  010346                           MOV     R3,-(SP)                ;;PUSH R3 ON STACK
   (3)  024646  010546                           MOV     R5,-(SP)                ;;PUSH R5 ON STACK
   (1)  024650  012746  020200                   MOV     #20200,-(SP)            ;;SET BLANK SWITCH AND SIGN
   (1)  024654  016605  000020                   MOV     20(SP),R5               ;;GET THE INPUT NUMBER
   (1)  024660  100004                           BPL     1$                      ;;BR IF INPUT IS POS.
   (1)  024662  005405                           NEG     R5                      ;;MAKE THE BINARY NUMBER POS.
   (1)  024664  112766  000055  000001           MOVB    #'-,1(SP)               ;;MAKE THE ASCII NUMBER NEG.
   (1)  024672  005000                   1$:     CLR     R0                      ;;ZERO THE CONSTANTS INDEX
   (1)  024674  012703  025052                   MOV     #$DBLK,R3               ;;SETUP THE OUTPUT POINTER
   (1)  024700  112723  000040                   MOVB    #' ,(R3)+               ;;SET THE FIRST CHARACTER TO A BLANK
   (1)  024704  005002                   2$:     CLR     R2                      ;;CLEAR THE BCD NUMBER
   (1)  024706  016001  025042                   MOV     $DTBL(R0),R1            ;;GET THE CONSTANT
   (1)  024712  160105                   3$:     SUB     R1,R5                   ;;FORM THIS BCD DIGIT
   (1)  024714  002402                           BLT     4$                      ;;BR IF DONE
   (1)  024716  005202                           INC     R2                      ;;INCREASE THE BCD DIGIT BY 1
   (1)  024720  000774                           BR      3$
   (1)  024722  060105                   4$:     ADD     R1,R5                   ;;ADD BACK THE CONSTANT
   (1)  024724  005702                           TST     R2                      ;;CHECK IF BCD DIGIT=0
   (1)  024726  001002                           BNE     5$                      ;;FALL THROUGH IF 0
   (1)  024730  105716                           TSTB    (SP)                    ;;STILL DOING LEADING 0'S?
   (1)  024732  100407                           BMI     7$                      ;;BR IF YES
   (1)  024734  106316                   5$:     ASLB    (SP)                    ;;MSD?
  (1)  024736  103003                           BCC     6$                  ;;BR IF NO
  (1)  024740  116663  000001  177777           MOVB    1(SP),-1(R3)        ;;YES--SET THE SIGN
  (1)  024746  052702  000060          6$:      BIS     #'0,R2              ;;MAKE THE BCD DIGIT ASCII
  (1)  024752  052702  000040          7$:      BIS     #' ,R2              ;;MAKE IT A SPACE IF NOT ALREADY A DIGIT
  (1)  024756  110223                           MOVB    R2,(R3)+            ;;PUT THIS CHARACTER IN THE OUTPUT BUFFER
  (1)  024760  005720                           TST     (R0)+               ;;JUST INCREMENTING
  (1)  024762  020027  000010                   CMP     R0,#10              ;;CHECK THE TABLE INDEX
  (1)  024766  002746                           BLT     2$                  ;;GO DO THE NEXT DIGIT
  (1)  024770  003002                           BGT     8$                  ;;GO TO EXIT
  (1)  024772  010502                           MOV     R5,R2               ;;GET THE LSD
  (1)  024774  000764                           BR      6$                  ;;GO CHANGE TO ASCII
  (1)  024776  105726                  8$:      TSTB    (SP)+               ;;WAS THE LSD THE FIRST NON-ZERO?
  (1)  025000  100003                           BPL     9$                  ;;BR IF NO
  (1)  025002  116663  177777  177776           MOVB    -1(SP),-2(R3)       ;;YES--SET THE SIGN FOR TYPING
  (1)  025010  105013                  9$:      CLRB    (R3)                ;;SET THE TERMINATOR
  (3)  025012  012605                           MOV     (SP)+,R5            ;;POP STACK INTO R5
  (3)  025014  012603                           MOV     (SP)+,R3            ;;POP STACK INTO R3
  (3)  025016  012602                           MOV     (SP)+,R2            ;;POP STACK INTO R2
  (3)  025020  012601                           MOV     (SP)+,R1            ;;POP STACK INTO R1
  (3)  025022  012600                           MOV     (SP)+,R0            ;;POP STACK INTO R0
  (1)  025024  104401  025052                   TYPE    ,$DBLK              ;;NOW TYPE THE NUMBER
  (1)  025030  016666  000002  000004           MOV     2(SP),4(SP)         ;;ADJUST THE STACK
  (1)  025036  012616                           MOV     (SP)+,(SP)
  (1)  025040  000002                           RTI                         ;;RETURN TO USER
  (1)  025042  023420                  $DTBL:   10000.
  (1)  025044  001750                           1000.
  (1)  025046  000144                           100.
  (1)  025050  000012                           10.
  (1)  025052  000004                  $DBLK:   .BLKW   4
 3741                                  .SBTTL   SCOPE HANDLER ROUTINE
  (1)
  (2)                                  ;;*******************************************************************
  (1)                                  ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
  (1)                                  ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
  (1)                                  ;*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
  (1)                                  ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
  (1)                                  ;*SW14=1         LOOP ON TEST
  (1)                                  ;*SW09=1         LOOP ON ERROR
  (1)                                  ;*SW08=1         LOOP ON TEST IN SWR<7:0>
  (1)                                  ;*CALL
  (1)                                  ;*       SCOPE               ;;SCOPE=IOT
  (1)
  (1)  025062                          $SCOPE:
  (1)  025062  104407                           CKSWR                       ;;TEST  FOR CHANGE IN SOFT-SWR
  (1)  025064  032777  040000  154046  1$:      BIT     #BIT14,@SWR         ;;LOOP ON PRESENT TEST?
  (1)  025072  001062                           BNE     $OVER               ;;YES IF SW14=1
  (1)                                  ;#####START OF CODE FOR THE XOR TESTER#####
  (1)  025074  000416                  $XTSTR: BR      6$                  ;;IF RUNNING ON THE ''XOR'' TESTER CHANGE
  (1)                                                                      ;;THIS INSTRUCTION TO A ''NOP'' (NOP=240)
  (1)  025076  013746  000004                   MOV     @#ERRVEC,-(SP)      ;;SAVE THE CONTENTS OF THE ERROR VECTOR
  (1)  025102  012737  025122  000004           MOV     #5$,@#ERRVEC        ;;SET FOR TIMEOUT
  (1)  025110  005737  177060                   TST     @#177060            ;;TIME OUT ON XOR?
  (1)  025114  012637  000004                   MOV     (SP)+,@#ERRVEC      ;;RESTORE THE ERROR VECTOR
  (1)  025120  000431                           BR      $SVLAD              ;;GO TO THE NEXT TEST
  (1)  025122  022626                  5$:      CMP     (SP)+,(SP)+         ;;CLEAR THE STACK AFTER A TIME OUT
  (1)  025124  012637  000004                   MOV     (SP)+,@#ERRVEC      ;;RESTORE THE ERROR VECTOR
  (1)  025130  000417                          BR      7$                ;;LOOP ON THE PRESENT TEST
  (1)  025132                          6$:;#####END OF CODE FOR THE XOR TESTER#####
  (1)  025132  032777  000400  154000          BIT     #BIT08,@SWR       ;;LOOP ON SPEC. TEST?
  (1)  025140  001404                          BEQ     2$                ;;BR IF NO
  (1)  025142  127737  153772  001102          CMPB    @SWR,$TSTNM       ;;ON THE RIGHT TEST?    SWR<7:0>
  (1)  025150  001433                          BEQ     $OVER             ;;BR IF YES
  (1)  025152  105737  001103          2$:     TSTB    $ERFLG            ;;HAS AN ERROR OCCURRED?
  (1)  025156  001412                          BEQ     $SVLAD            ;;BR IF NO
  (1)  025160  032777  001000  153752          BIT     #BIT09,@SWR       ;;LOOP ON ERROR?
  (1)  025166  001404                          BEQ     4$                ;;BR IF NO
  (1)  025170  013737  001110  001106  7$:     MOV     $LPERR,$LPADR     ;;SET LOOP ADDRESS TO LAST SCOPE
  (1)  025176  000420                          BR      $OVER
  (1)  025200  105037  001103          4$:     CLRB    $ERFLG            ;;ZERO THE ERROR FLAG
  (1)  025204  105237  001102          $SVLAD: INCB    $TSTNM            ;;COUNT TEST NUMBERS
  (1)  025210  113737  001102  001204          MOVB    $TSTNM,$TESTN     ;;SET TEST NUMBER IN APT MAILBOX
  (1)  025216  011637  001106                  MOV     (SP),$LPADR       ;;SAVE SCOPE LOOP ADDRESS
  (1)  025222  011637  001110                  MOV     (SP),$LPERR       ;;SAVE ERROR LOOP ADDRESS
  (1)  025226  005037  001166                  CLR     $ESCAPE           ;;CLEAR THE ESCAPE FROM ERROR ADDRESS
  (1)  025232  112737  000001  001115          MOVB    #1,$ERMAX         ;;ONLY ALLOW ONE(1) ERROR ON NEXT TEST
  (1)  025240  013777  001102  153674  $OVER:  MOV     $TSTNM,@DISPLAY   ;;DISPLAY TEST NUMBER
  (1)  025246  013716  001106                  MOV     $LPADR,(SP)       ;;FUDGE RETURN ADDRESS
  (1)  025252  000002                          RTI                       ;;FIXES PS
 3742                                  .SBTTL  READ AN OCTAL NUMBER FROM THE TTY
  (1)
  (2)                                  ;;*******************************************************************
  (1)                                  ;*THIS ROUTINE WILL READ AN OCTAL (ASCII) NUMBER FROM THE TTY AND
  (1)                                  ;*CHANGE IT TO BINARY.
  (1)                                  ;*CALL:
  (1)                                  ;*      RDOCT                     ;;READ AN OCTAL NUMBER
  (1)                                  ;*      RETURN HERE               ;;LOW ORDER BITS ARE ON TOP OF THE STACK
  (1)                                  ;*                                ;;HIGH ORDER BITS ARE IN $HIOCT
  (1)
  (1)  025254  011646                  $RDOCT: MOV     (SP),-(SP)        ;;PROVIDE SPACE FOR THE
  (1)  025256  016666  000004  000002          MOV     4(SP),2(SP)       ;;INPUT NUMBER
  (3)  025264  010046                          MOV     R0,-(SP)          ;;PUSH R0 ON STACK
  (3)  025266  010146                          MOV     R1,-(SP)          ;;PUSH R1 ON STACK
  (3)  025270  010246                          MOV     R2,-(SP)          ;;PUSH R2 ON STACK
  (1)  025272  104411                  1$:     RDLIN                     ;;READ AN ASCIZ LINE
  (1)  025274  012600                          MOV     (SP)+,R0          ;;GET ADDRESS OF 1ST CHARACTER
  (1)  025276  005001                          CLR     R1                ;;CLEAR DATA WORD
  (1)  025300  005002                          CLR     R2
  (1)  025302  112046                  2$:     MOVB    (R0)+,-(SP)       ;;PICKUP THIS CHARACTER
  (1)  025304  001412                          BEQ     3$                ;;IF ZERO GET OUT
  (1)  025306  006301                          ASL     R1                ;;*2
  (1)  025310  006102                          ROL     R2
  (1)  025312  006301                          ASL     R1                ;;*4
  (1)  025314  006102                          ROL     R2
  (1)  025316  006301                          ASL     R1                ;;*8
  (1)  025320  006102                          ROL     R2
  (1)  025322  042716  177770                  BIC     #^C7,(SP)         ;;STRIP THE ASCII JUNK
  (1)  025326  062601                          ADD     (SP)+,R1          ;;ADD IN THIS DIGIT
  (1)  025330  000764                          BR      2$                ;;LOOP
  (1)  025332  005726                  3$:     TST     (SP)+             ;;CLEAN TERMINATOR FROM STACK
  (1)  025334  010166  000012                  MOV     R1,12(SP)         ;;SAVE THE RESULT
  (1)  025340  010237  025354                  MOV     R2,$HIOCT
  (3)  025344  012602                          MOV     (SP)+,R2          ;;POP STACK INTO R2
 (3)  025346  012601                           MOV     (SP)+,R1             ;;POP STACK INTO R1
 (3)  025350  012600                           MOV     (SP)+,R0             ;;POP STACK INTO R0
 (1)  025352  000002                           RTI                          ;;RETURN
 (1)  025354  000000                   $HIOCT: .WORD   0                    ;;HIGH ORDER BITS GO HERE
3743                                   .SBTTL  TTY INPUT ROUTINE
 (1)
 (2)                                   ;;*************************************************************
 (1)                                   .ENABL  LSB
 (1)
 (2)                                   ;;*************************************************************
 (1)                                   ;*SOFTWARE SWITCH REGISTER CHANGE ROUTINE.
 (1)                                   ;*ROUTINE IS ENTERED FROM THE TRAP HANDLER, AND WILL
 (1)                                   ;*SERVICE THE TEST FOR CHANGE IN SOFTWARE SWITCH REGISTER TRAP CALL
 (1)                                   ;*WHEN OPERATING IN TTY FLAG MODE.
 (1)  025356  022737  000176  001140   $CKSWR: CMP     #SWREG,SWR           ;;IS THE SOFT-SWR SELECTED?
 (1)  025364  001074                           BNE     15$                  ;;BRANCH IF NO
 (1)  025366  105777  153552                   TSTB    @$TKS                ;;CHAR THERE?
 (1)  025372  100071                           BPL     15$                  ;;IF NO, DON'T WAIT AROUND
 (1)  025374  117746  153546                   MOVB    @$TKB,-(SP)          ;;SAVE THE CHAR
 (1)  025400  042716  177600                   BIC     #^C177,(SP)          ;;STRIP-OFF THE ASCII
 (1)  025404  022726  000007                   CMP     #7,(SP)+             ;;IS IT A CONTROL G?
 (1)  025410  001062                           BNE     15$                  ;;NO, RETURN TO USER
 (1)  025412  123727  001134  000001           CMPB    $AUTOB,#1            ;;ARE WE RUNNING IN AUTO-MODE?
 (1)  025420  001456                           BEQ     15$                  ;;BRANCH IF YES
 (1)
 (1)  025422  104401  026103                   TYPE    ,$CNTLG              ;;ECHO THE CONTROL-G (^G)
 (1)  025426  104401  026110           $GTSWR: TYPE    ,$MSWR               ;;TYPE CURRENT CONTENTS
 (2)  025432  013746  000176                   MOV     SWREG,-(SP)          ;;SAVE SWREG FOR TYPEOUT
 (2)  025436  104402                           TYPOC                        ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
 (1)  025440  104401  026121                   TYPE    ,$MNEW               ;;PROMPT FOR NEW SWR
 (1)  025444  005046                   19$:    CLR     -(SP)                ;;CLEAR COUNTER
 (1)  025446  005046                           CLR     -(SP)                ;;THE NEW SWR
 (1)  025450  105777  153470           7$:     TSTB    @$TKS                ;;CHAR THERE?
 (1)  025454  100375                           BPL     7$                   ;;IF NOT TRY AGAIN
 (1)
 (1)  025456  117746  153464                   MOVB    @$TKB,-(SP)          ;;PICK UP CHAR
 (1)  025462  042716  177600                   BIC     #^C177,(SP)          ;;MAKE IT 7-BIT ASCII
 (1)
 (1)
 (1)
 (1)  025466  021627  000025           9$:     CMP     (SP),#25             ;;IS IT A CONTROL-U?
 (1)  025472  001005                           BNE     10$                  ;;BRANCH IF NOT
 (1)  025474  104401  026076                   TYPE    ,$CNTLU              ;;YES, ECHO CONTROL-U (^U)
 (1)  025500  062706  000006           20$:    ADD     #6,SP                ;;IGNORE PREVIOUS INPUT
 (1)  025504  000757                           BR      19$                  ;;LET'S TRY IT AGAIN
 (1)
 (1)
 (1)  025506  021627  000015           10$:    CMP     (SP),#15             ;;IS IT A <CR>?
 (1)  025512  001022                           BNE     16$                  ;;BRANCH IF NO
 (1)  025514  005766  000004                   TST     4(SP)                ;;YES, IS IT THE FIRST CHAR?
 (1)  025520  001403                           BEQ     11$                  ;;BRANCH IF YES
 (1)  025522  016677  000002  153410           MOV     2(SP),@SWR           ;;SAVE NEW SWR
 (1)  025530  062706  000006           11$:    ADD     #6,SP                ;;CLEAR UP STACK
 (1)  025534  104401  001175           14$:    TYPE    ,$CRLF               ;;ECHO <CR> AND <LF>
 (1)  025540  123727  001135  000001           CMPB    $INTAG,#1            ;;RE-ENABLE TTY KBD INTERRUPTS?
 (1)  025546  001003                           BNE     15$                  ;;BRANCH IF NOT
 (1)  025550  012777  000100  153366             MOV     #100,@$TKS          ;;RE-ENABLE TTY KBD INTERRUPTS
 (1)  025556  000002                      15$:   RTI                         ;;RETURN
 (1)  025560  004737  026344              16$:   JSR     PC,$TYPEC           ;;ECHO CHAR
 (1)  025564  021627  000060                     CMP     (SP),#60            ;;CHAR < 0?
 (1)  025570  002420                             BLT     18$                 ;;BRANCH IF YES
 (1)  025572  021627  000067                     CMP     (SP),#67            ;;CHAR > 7?
 (1)  025576  003015                             BGT     18$                 ;;BRANCH IF YES
 (1)  025600  042726  000060                     BIC     #60,(SP)+           ;;STRIP-OFF ASCII
 (1)  025604  005766  000002                     TST     2(SP)               ;;IS THIS THE FIRST CHAR
 (1)  025610  001403                             BEQ     17$                 ;;BRANCH IF YES
 (1)  025612  006316                             ASL     (SP)                ;;NO, SHIFT PRESENT
 (1)  025614  006316                             ASL     (SP)                ;;   CHAR OVER TO MAKE
 (1)  025616  006316                             ASL     (SP)                ;;   ROOM FOR NEW ONE.
 (1)  025620  005266  000002              17$:   INC     2(SP)               ;;KEEP COUNT OF CHAR
 (1)  025624  056616  177776                     BIS     -2(SP),(SP)         ;;SET IN NEW CHAR
 (1)  025630  000707                             BR      7$                  ;;GET THE NEXT ONE
 (1)  025632  104401  001174              18$:   TYPE    ,$QUES              ;;TYPE ?<CR><LF>
 (1)  025636  000720                             BR      20$                 ;;SIMULATE CONTROL-U
 (1)                                      .DSABL LSB
 (1)
 (1)
 (2)                                      ;;*******************************************************************
 (1)                                      ;*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
 (1)                                      ;*CALL:
 (1)                                      ;*      RDCHR                            ;;INPUT A SINGLE CHARACTER FROM THE TTY
 (1)                                      ;*      RETURN HERE                      ;;CHARACTER IS ON THE STACK
 (1)                                      ;*                                       ;;WITH PARITY BIT STRIPPED OFF
 (1)                                      ;
 (1)
 (1)  025640  011646                      $RDCHR: MOV    (SP),-(SP)          ;;PUSH DOWN THE PC
 (1)  025642  016666  000004  000002             MOV     4(SP),2(SP)         ;;SAVE THE PS
 (1)  025650  105777  153270              1$:    TSTB    @$TKS               ;;WAIT FOR
 (1)  025654  100375                             BPL     1$                  ;;A CHARACTER
 (1)  025656  117766  153264  000004             MOVB    @$TKB,4(SP)         ;;READ THE TTY
 (1)  025664  042766  177600  000004             BIC     #^C<177>,4(SP)      ;;GET RID OF JUNK IF ANY
 (1)  025672  026627  000004  000023             CMP     4(SP),#23           ;;IS IT A CONTROL-S?
 (1)  025700  001[illegible]                         BNE     3$                  ;;BRANCH IF NO
 (1)  025702  10[illegible]  [illegible]              2$:    TSTB    @$TKS               ;;WAIT FOR A CHARACTER
 (1)  025706  [illegible]                             BPL     2$                  ;;LOOP UNTIL ITS THERE
 (1)  025710  [illegible]  [illegible]                     MOVB    @$TKB,-(SP)         ;;GET CHARACTER
 (1)  025714  0[illegible]  [illegible]                     BIC     #^C177,(SP)         ;;MAKE IT 7-BIT ASCII
 (1)  025720  022[illegible]  [illegible]                     CMP     (SP)+,#21           ;;IS IT A CONTROL-Q?
 (1)  025724  001366                             BNE     2$                  ;;IF NOT DISCARD IT
 (1)  025726  000750                             BR      1$                  ;;YES, RESUME
 (1)  025730  026627  000004  000140      3$:    CMP     4(SP),#140          ;;IS IT UPPER CASE?
 (1)  025736  002407                             BLT     4$                  ;;BRANCH IF YES
 (1)  025740  026627  000004  000175             CMP     4(SP),#175          ;;IS IT A SPECIAL CHAR?
 (1)  025746  003003                             BGT     4$                  ;;BRANCH IF YES
 (1)  025750  042766  000040  000004             BIC     #40,4(SP)           ;;MAKE IT UPPER CASE
 (1)  025756  000002                      4$:    RTI                         ;;GO BACK TO USER
 (2)                                      ;;*******************************************************************
 (1)                                      ;*THIS ROUTINE WILL INPUT A STRING FROM THE TTY
 (1)                                      ;*CALL:
 (1)                                      ;*      RDLIN                            ;;INPUT A STRING FROM THE TTY
 (1)                                      ;*      RETURN HERE                      ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
 (1)                                      ;*                                       ;;TERMINATOR WILL BE A BYTE OF ALL 0'S
```

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    (1)
    (1)  025760  010346                    $RDLIN: MOV     R3,-(SP)            ;;SAVE R3
    (1)  025762  012703  026066            1$:     MOV     #$TTYIN,R3          ;;GET ADDRESS
    (1)  025766  022703  026076            2$:     CMP     #$TTYIN+8.,R3       ;;BUFFER FULL?
    (1)  025772  101405                            BLOS    4$                  ;;BR IF YES
    (1)  025774  104410                            RDCHR                       ;;GO READ ONE CHARACTER FROM THE TTY
    (1)  025776  112613                            MOVB    (SP)+,(R3)          ;;GET CHARACTER
    (1)  026000  122713  000177            10$:    CMPB    #177,(R3)           ;;IS IT A RUBOUT
    (1)  026004  001003                            BNE     3$                  ;;SKIP IF NOT
    (1)  026006  104401  001174            4$:     TYPE    ,$QUES              ;;TYPE A '?'
    (1)  026012  000763                            BR      1$                  ;;CLEAR THE BUFFER AND LOOP
    (1)  026014  111337  026064            3$:     MOVB    (R3),9$             ;;ECHO THE CHARACTER
    (1)  026020  104401  026064                    TYPE    ,9$
    (1)  026024  122723  000015                    CMPB    #15,(R3)+           ;;CHECK FOR RETURN
    (1)  026030  001356                            BNE     2$                  ;;LOOP IF NOT RETURN
    (1)  026032  105063  177777                    CLRB    -1(R3)              ;;CLEAR RETURN (THE 15)
    (1)  026036  104401  001176                    TYPE    ,$LF                ;;TYPE A LINE FEED
    (1)  026042  012603                            MOV     (SP)+,R3            ;;RESTORE R3
    (1)  026044  011646                            MOV     (SP),-(SP)          ;;ADJUST THE STACK AND PUT ADDRESS OF THE
    (1)  026046  016666  000004  000002            MOV     4(SP),2(SP)         ;;        FIRST ASCII CHARACTER ON IT
    (1)  026054  012766  026066  000004            MOV     #$TTYIN,4(SP)
    (1)  026062  000002                            RTI                         ;;RETURN
    (1)  026064     000                    9$:     .BYTE   0                   ;;STORAGE FOR ASCII CHAR. TO TYPE
    (1)  026065     000                            .BYTE   0                   ;;TERMINATOR
    (1)  026066  000010                    $TTYIN: .BLKB   8.                  ;;RESERVE 8 BYTES FOR TTY INPUT
    (1)  026076  052536  005015     000    $CNTLU: .ASCIZ  /^U/<15><12>        ;;CONTROL "U"
    (1)  026103     136  006507  000012    $CNTLG: .ASCIZ  /^G/<15><12>        ;;CONTROL "G"
    (1)  026110  005015  053523  020122    $MSWR:  .ASCIZ  <15><12>/SWR = /
    (1)  026116  020075     000
    (1)  026121     040  047040  053505    $MNEW:  .ASCIZ  /  NEW = /
    (1)  026126  036440  000040
                                           .SBTTL  TYPE ROUTINE
    (1)
    (2)                                    ;;*****************************************************************
    (1)                                    ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
    (1)                                    ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
    (1)                                    ;*NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
    (1)                                    ;*NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
    (1)                                    ;*NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
    (1)                                    ;*
    (1)                                    ;*CALL:
    (1)                                    ;*1) USING A TRAP INSTRUCTION
    (1)                                    ;*      TYPE    ,MESADR             ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
    (1)                                    ;*OR
    (1)                                    ;*      TYPE
    (1)                                    ;*      MESADR
    (1)                                    ;*
    (1)
    (1)  026132  105737  001157            $TYPE:  TSTB    $TPFLG              ;;IS THERE A TERMINAL?
    (1)  026136  100002                            BPL     1$                  ;;BR IF YES
    (1)  026140  000000                            HALT                        ;;HALT HERE IF NO TERMINAL
    (1)  026142  000430                            BR      3$                  ;;LEAVE
    (1)  026144  010046                    1$:     MOV     R0,-(SP)            ;;SAVE R0
    (1)  026146  017600  000002                    MOV     @2(SP),R0           ;;GET ADDRESS OF ASCIZ STRING
    (1)  026152  122737  000001  001220            CMPB    #APTENV,$ENV        ;;RUNNING IN APT MODE
    (1)  026160  001011                            BNE     62$                 ;;NO,GO CHECK FOR APT CONSOLE
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 (1)  026162  132737  000100  001221          BITB    #APTSPOOL,$ENVM  ;;SPOOL MESSAGE TO APT
 (1)  026170  001405                          BEQ     62$              ;;NO,GO CHECK FOR CONSOLE
 (1)  026172  010037  026202                  MOV     R0,61$           ;;SETUP MESSAGE ADDRESS FOR APT
 (1)  026176  004737  026422                  JSR     PC,$ATY3         ;;SPOOL MESSAGE TO APT
 (1)  026202  000000                  61$:    .WORD   0                ;;MESSAGE ADDRESS
 (1)  026204  132737  000040  001221  62$:    BITB    #APTCSUP,$ENVM   ;;APT CONSOLE SUPPRESSED
 (1)  026212  001003                          BNE     60$              ;;YES,SKIP TYPE OUT
 (1)  026214  112046                  2$:     MOVB    (R0)+,-(SP)      ;;PUSH CHARACTER TO BE TYPED ONTO STACK
 (1)  026216  001005                          BNE     4$               ;;BR IF IT ISN'T THE TERMINATOR
 (1)  026220  005726                          TST     (SP)+            ;;IF TERMINATOR POP IT OFF THE STACK
 (1)  026222  012600                  60$:    MOV     (SP)+,R0         ;;RESTORE R0
 (1)  026224  062716  000002          3$:     ADD     #2,(SP)          ;;ADJUST RETURN PC
 (1)  026230  000002                          RTI                      ;;RETURN
 (1)  026232  122716  000011          4$:     CMPB    #HT,(SP)         ;;BRANCH IF <HT>
 (1)  026236  001430                          BEQ     8$
 (1)  026240  122716  000200                  CMPB    #CRLF,(SP)       ;;BRANCH IF NOT <CRLF>
 (1)  026244  001006                          BNE     5$
 (1)  026246  005726                          TST     (SP)+            ;;POP  <CR><LF> EQUIV
 (1)  026250  104401                          TYPE                     ;;TYPE A CR AND LF
 (1)  026252  001175                          $CRLF
 (1)  026254  105037  026410                  CLRB    $CHARCNT         ;;CLEAR CHARACTER COUNT
 (1)  026260  000755                          BR      2$               ;;GET NEXT CHARACTER
 (1)  026262  004737  026344          5$:     JSR     PC,$TYPEC        ;;GO TYPE THIS CHARACTER
 (1)  026266  123726  001156          6$:     CMPB    $FILLC,(SP)+     ;;IS IT TIME FOR FILLER CHARS.?
 (1)  026272  001350                          BNE     2$               ;;IF NO GO GET NEXT CHAR.
 (1)  026274  013746  001154                  MOV     $NULL,-(SP)      ;;GET # OF FILLER CHARS. NEEDED
 (1)                                                                   ;;AND THE NULL CHAR.
 (1)  026300  105366  000001          7$:     DECB    1(SP)            ;;DOES A NULL NEED TO BE TYPED?
 (1)  026304  002770                          BLT     6$               ;;BR IF NO--GO POP THE NULL OFF OF STACK
 (1)  026306  004737  026344                  JSR     PC,$TYPEC        ;;GO TYPE A NULL
 (1)  026312  105337  026410                  DECB    $CHARCNT         ;;DO NOT COUNT AS A COUNT
 (1)  026316  000770                          BR      7$               ;;LOOP
 (1)
 (1)                                  ;HORIZONTAL TAB PROCESSOR
 (1)
 (1)  026320  112716  000040          8$:     MOVB    #' ,(SP)         ;;REPLACE TAB WITH SPACE
 (1)  026324  004737  026344          9$:     JSR     PC,$TYPEC        ;;TYPE A SPACE
 (1)  026330  132737  000007  026410          BITB    #7,$CHARCNT      ;;BRANCH IF NOT AT
 (1)  026336  001372                          BNE     9$               ;;TAB STOP
 (1)  026340  005726                          TST     (SP)+            ;;POP SPACE OFF STACK
 (1)  026342  000724                          BR      2$               ;;GET NEXT CHARACTER
 (1)  026344  105777  152600          $TYPEC: TSTB    @$TPS            ;;WAIT UNTIL PRINTER IS READY
 (1)  026350  100375                          BPL     $TYPEC
 (1)  026352  116677  000002  152572          MOVB    2(SP),@$TPB      ;;LOAD CHAR TO BE TYPED INTO DATA REG.
 (1)  026360  122766  000015  000002          CMPB    #CR,2(SP)        ;;IS CHARACTER A CARRIAGE RETURN?
 (1)  026366  001003                          BNE     1$               ;;BRANCH IF NO
 (1)  026370  105037  026410                  CLRB    $CHARCNT         ;;YES--CLEAR CHARACTER COUNT
 (1)  026374  000406                          BR      $TYPEX           ;;EXIT
 (1)  026376  122766  000012  000002  1$:     CMPB    #LF,2(SP)        ;;IS CHARACTER A LINE FEED?
 (1)  026404  001402                          BEQ     $TYPEX           ;;BRANCH IF YES
 (1)  026406  105227                          INCB    (PC)+            ;;COUNT THE CHARACTER
 (1)  026410  000000                  $CHARCNT:.WORD  0                ;;CHARACTER COUNT STORAGE
 (1)  026412  000207                  $TYPEX: RTS     PC
 (1)
3745                                  .SBTTL  APT COMMUNICATIONS ROUTINE
 (1)
 (2)                                      ;;*****************************************************************
 (1)  026414  112737  000001  026660  $ATY1:   MOVB    #1,$FFLG          ;;TO REPORT FATAL ERROR
 (1)  026422  112737  000001  026656  $ATY3:   MOVB    #1,$MFLG          ;;TO TYPE A MESSAGE
 (1)  026430  000403                           BR      $ATYC
 (1)  026432  112737  000001  026660  $ATY4:   MOVB    #1,$FFLG          ;;TO ONLY REPORT FATAL ERROR
 (1)  026440                          $ATYC:
 (3)  026440  010046                           MOV     R0,-(SP)          ;;PUSH R0 ON STACK
 (3)  026442  010146                           MOV     R1,-(SP)          ;;PUSH R1 ON STACK
 (1)  026444  105737  026656                   TSTB    $MFLG             ;;SHOULD TYPE A MESSAGE?
 (1)  026450  001450                           BEQ     5$                ;;IF NOT:  BR
 (1)  026452  122737  000001  001220           CMPB    #APTENV,$ENV      ;;OPERATING UNDER APT?
 (1)  026460  001031                           BNE     3$                ;;IF NOT:  BR
 (1)  026462  132737  000100  001221           BITB    #APTSPOOL,$ENVM   ;;SHOULD SPOOL MESSAGES?
 (1)  026470  001425                           BEQ     3$                ;;IF NOT:  BR
 (1)  026472  017600  000004                   MOV     @4(SP),R0         ;;GET MESSAGE ADDR.
 (1)  026476  062766  000002  000004           ADD     #2,4(SP)                  ;;BUMP RETURN ADDR.
 (1)  026504  005737  001200          1$:      TST     $MSGTYPE          ;;SEE IF DONE W/ LAST XMISSION?
 (1)  026510  001375                           BNE     1$                ;;IF NOT:  WAIT
 (1)  026512  010037  001214                   MOV     R0,$MSGAD         ;;PUT ADDR IN MAILBOX
 (1)  026516  105720                  2$:      TSTB    (R0)+             ;;FIND END OF MESSAGE
 (1)  026520  001376                           BNE     2$
 (1)  026522  163700  001214                   SUB     $MSGAD,R0         ;;SUB START OF MESSAGE
 (1)  026526  006200                           ASR     R0                ;;GET MESSAGE LENGTH IN WORDS
 (1)  026530  010037  001216                   MOV     R0,$MSGLGT        ;;PUT LENGTH IN MAILBOX
 (1)  026534  012737  000004  001200           MOV     #4,$MSGTYPE       ;;TELL APT TO TAKE MSG.
 (1)  026542  000413                           BR      5$
 (1)  026544  017637  000004  026570  3$:      MOV     @4(SP),4$         ;;PUT MSG ADDR IN JSR LINKAGE
 (1)  026552  062766  000002  000004           ADD     #2,4(SP)                  ;;BUMP RETURN ADDRESS
 (3)  026560  013746  177776                   MOV     177776,-(SP)      ;;PUSH 177776 ON STACK
 (1)  026564  004737  026132                   JSR     PC,$TYPE          ;;CALL TYPE MACRO
 (1)  026570  000000                  4$:      .WORD   0
 (1)  026572                          5$:
 (1)  026572  105737  026660          10$:     TSTB    $FFLG             ;;SHOULD REPORT FATAL ERROR?
 (1)  026576  001416                           BEQ     12$               ;;IF NOT:  BR
 (1)  026600  005737  001220                   TST     $ENV              ;;RUNNING UNDER APT?
 (1)  026604  001413                           BEQ     12$               ;;IF NOT:  BR
 (1)  026606  005737  001200          11$:     TST     $MSGTYPE          ;;FINISHED LAST MESSAGE?
 (1)  026612  001375                           BNE     11$               ;;IF NOT:  WAIT
 (1)  026614  017637  000004  001202           MOV     @4(SP),$FATAL     ;;GET ERROR #
 (1)  026622  062766  000002  000004           ADD     #2,4(SP)                  ;;BUMP RETURN ADDR.
 (1)  026630  005237  001200                   INC     $MSGTYPE          ;;TELL APT TO TAKE ERROR
 (1)  026634  105037  026660          12$:     CLRB    $FFLG             ;;CLEAR FATAL FLAG
 (1)  026640  105037  026657                   CLRB    $LFLG             ;;CLEAR LOG FLAG
 (1)  026644  105037  026656                   CLRB    $MFLG             ;;CLEAR MESSAGE FLAG
 (3)  026650  012601                           MOV     (SP)+,R1          ;;POP STACK INTO R1
 (3)  026652  012600                           MOV     (SP)+,R0          ;;POP STACK INTO R0
 (1)  026654  000207                           RTS     PC                ;;RETURN
 (1)  026656     000                  $MFLG:   .BYTE   0                 ;;MESSG. FLAG
 (1)  026657     000                  $LFLG:   .BYTE   0                 ;;LOG FLAG
 (1)  026660     000                  $FFLG:   .BYTE   0                 ;;FATAL FLAG
 (1)          026662                           .EVEN
 (1)          000200                  APTSIZE=200
 (1)          000001                  APTENV=001
 (1)          000100                  APTSPOOL=100
 (1)          000040                  APTCSUP=040
                                      .SBTTL  POWER DOWN AND UP ROUTINES
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   (1)
   (2)                                        ;;*************************************************************
   (1)                                        ;POWER DOWN ROUTINE
   (1)  026662  012737  027026  000024  $PWRDN: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST UP
   (1)  026670  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;PRIO:7
   (3)  026676  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
   (3)  026700  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
   (3)  026702  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
   (3)  026704  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
   (3)  026706  010446                          MOV     R4,-(SP)        ;;PUSH R4 ON STACK
   (3)  026710  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
   (3)  026712  017746  152222                  MOV     @SWR,-(SP)      ;;PUSH @SWR ON STACK
   (1)  026716  010637  027032                  MOV     SP,$SAVR6       ;;SAVE SP
   (1)  026722  012737  026734  000024          MOV     #$PWRUP,@#PWRVEC ;;SET UP VECTOR
   (1)  026730  000000                          HALT
   (1)  026732  000776                          BR      .-2             ;;HANG UP
   (1)
   (2)                                        ;;*************************************************************
   (1)                                        ;POWER UP ROUTINE
   (1)  026734  012737  027026  000024  $PWRUP: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST DOWN
   (1)  026742  013706  027032                  MOV     $SAVR6,SP       ;;GET SP
   (1)  026746  005037  027032                  CLR     $SAVR6          ;;WAIT LOOP FOR THE TTY
   (1)  026752  005237  027032          1$:     INC     $SAVR6          ;;WAIT FOR THE INC
   (1)  026756  001375                          BNE     1$              ;;OF  WORD
   (3)  026760  012677  152154                  MOV     (SP)+,@SWR      ;;POP STACK INTO @SWR
   (3)  026764  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
   (3)  026766  012604                          MOV     (SP)+,R4        ;;POP STACK INTO R4
   (3)  026770  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
   (3)  026772  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
   (3)  026774  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
   (3)  026776  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
   (1)  027000  012737  026662  000024          MOV     #$PWRDN,@#PWRVEC ;;SET UP THE POWER DOWN VECTOR
   (1)  027006  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;PRIO:7
   (1)  027014  104401                          TYPE                    ;;REPORT THE POWER FAILURE
   (1)  027016  027034                  $PWRMG: .WORD   PWRMSG          ;;POWER FAIL MESSAGE POINTER
   (1)  027020  012716                          MOV     (PC)+,(SP)      ;;RESTART AT START
   (1)  027022  001726                  $PWRAD: .WORD   START           ;;RESTART ADDRESS
   (1)  027024  000002                          RTI
   (1)  027026  000000                  $ILLUP: HALT                    ;;THE POWER UP SEQUENCE WAS STARTED
   (1)  027030  000776                          BR      .-2             ;; BEFORE THE POWER DOWN WAS COMPLETE
   (1)  027032  000000                  $SAVR6: 0                       ;;PUT THE SP HERE
  3747  027034     015     012          PWRMSG: .BYTE   15,12
  3748  027036  042522  052123  051101          .ASCII  /RESTARTING AFTER A POWER FAILURE/
        027044  044524  043516  040440
        027052  052106  051105  040440
        027060  050040  053517  051105
        027066  043040  044501  052514
        027074  042522
  3749  027076     015     012     012          .BYTE   15,12,12,0
        027101     000
  3750                                          .EVEN
  3751                                  .SBTTL  TRAP DECODER
   (1)
   (2)                                        ;;*************************************************************
   (1)                                        ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
   (1)                                        ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
  (1)                                   ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
  (1)                                   ;*GO TO THAT ROUTINE.
  (1)
  (1)   027102  010046                  $TRAP:  MOV     R0,-(SP)          ;;SAVE R0
  (1)   027104  016600  000002                  MOV     2(SP),R0          ;;GET TRAP ADDRESS
  (1)   027110  005740                          TST     -(R0)             ;;BACKUP BY 2
  (1)   027112  111000                          MOVB    (R0),R0           ;;GET RIGHT BYTE OF TRAP
  (1)   027114  006300                          ASL     R0                ;;POSITION FOR INDEXING
  (1)   027116  016000  027136                  MOV     $TRPAD(R0),R0     ;;INDEX TO TABLE
  (1)   027122  000200                          RTS     R0                ;;GO TO ROUTINE
  (1)
  (1)
  (1)                                   ;;THIS IS USE TO HANDLE THE ''GETPRI'' MACRO
  (1)
  (1)   027124  011646                  $TRAP2: MOV     (SP),-(SP)        ;;MOVE THE PC DOWN
  (1)   027126  016666  000004  000002          MOV     4(SP),2(SP)       ;;MOVE THE PSW DOWN
  (1)   027134  000002                          RTI                       ;;RESTORE THE PSW
  (1)
  (3)                                   .SBTTL  TRAP TABLE
  (3)
  (3)                                   ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
  (3)                                   ;*BY THE ''TRAP'' INSTRUCTION.
  (3)
  (3)                                   ;       ROUTINE
  (3)                                           -------
  (3)   027136  027124                  $TRPAD: .WORD   $TRAP2
  (3)   027140  026132                          $TYPE   ;;CALL=TYPE     TRAP+1(104401)   TTY TYPEOUT ROUTINE
  (3)   027142  024100                          $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)   TYPE OCTAL NUMBER (WITH LEADING ZEROS)
  (3)   027144  024054                          $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)   TYPE OCTAL NUMBER (NO LEADING ZEROS)
  (3)   027146  024114                          $TYPON  ;;CALL=TYPON    TRAP+4(104404)   TYPE OCTAL NUMBER (AS PER LAST CALL)
  (3)   027150  024636                          $TYPDS  ;;CALL=TYPDS    TRAP+5(104405)   TYPE DECIMAL NUMBER (WITH SIGN)
  (1)
  (3)   027152  025426                          $GTSWR  ;;CALL=GTSWR    TRAP+6(104406)   GET SOFT-SWR SETTING
  (1)
  (3)   027154  025356                          $CKSWR  ;;CALL=CKSWR    TRAP+7(104407)   TEST FOR CHANGE IN SOFT-SWR
  (3)   027156  025640                          $RDCHR  ;;CALL=RDCHR    TRAP+10(104410)  TTY TYPEIN CHARACTER ROUTINE
  (3)   027160  025760                          $RDLIN  ;;CALL=RDLIN    TRAP+11(104411)  TTY TYPEIN STRING ROUTINE
  (3)   027162  025254                          $RDOCT  ;;CALL=RDOCT    TRAP+12(104412)  READ AN OCTAL NUMBER FROM TTY
 3752   027164  023700                          IOTRD   ;;CALL=IOTT     TRAP+13(104413)
 3753   027166  005015  046103  041517  EM1:    .ASCIZ  <15><12>/CLOCKA SR FUNCTION ERROR/
        027174  040513  051440  020122
        027202  052506  041516  044524
        027210  047117  042440  051122
        027216  051117     000
 3754   027221     015  041412  047514  EM2:    .ASCIZ  <15><12>/CLOCKA SR DATA ERROR/
        027226  045503  020101  051123
        027234  042040  052101  020101
        027242  051105  047522  000122
 3755   027250  005015  046103  041517  EM3:    .ASCIZ  <15><12>/CLOCKA BR DATA ERROR/
        027256  040513  041040  020122
        027264  040504  040524  042440
        027272  051122  051117     000
 3756   027277     015  041412  047514  EM4:    .ASCIZ  <15><12>/CLOCKA CR DATA ERROR/
        027304  045503  020101  051103
        027312  042040  052101  020101
        027320  051105  047522  000122
 3757  027326  005015  046103  041517  EM5:    .ASCIZ  <15><12>/CLOCKB SR DATA ERROR/
       027334  041113  051440  020122
       027342  040504  040524  042440
       027350  051122  051117     000
 3758  027355     015  041412  047514  EM6:    .ASCIZ  <15><12>/CLOCKB BR DATA ERROR/
       027362  045503  020102  051102
       027370  042040  052101  020101
       027376  051105  047522  000122
 3759  027404  005015  046103  041517  EM7:    .ASCIZ  <15><12>/CLOCKB CR DATA ERROR/
       027412  041113  041440  020122
       027420  040504  040524  042440
       027426  051122  051117     000
 3760  027433     015  042012  040525  EM10:   .ASCIZ  <15><12>/DUAL ADDRESS ERROR/
       027440  020114  042101  051104
       027446  051505  020123  051105
       027454  047522  000122
 3761  027460  005015  046103  041517  EM11:   .ASCIZ  <15><12>#CLOCK A COUNT ERROR #
       027466  020113  020101  047503
       027474  047125  020124  051105
       027502  047522  020122     000
 3762  027507     015  041412  047514  EM12:   .ASCIZ  <15><12>#CLOCK A COUNT FUNCTION ERROR #
       027514  045503  040440  041440
       027522  052517  052116  043040
       027530  047125  052103  047511
       027536  020116  051105  047522
       027544  020122     000
 3763  027547     015  041412  047514  EM14:   .ASCIZ  <15><12>#CLOCK B COUNT FUNCTION ERROR #
       027554  045503  041040  041440
       027562  052517  052116  043040
       027570  047125  052103  047511
       027576  020116  051105  047522
       027604  020122     000
 3764  027607     015  041412  047514  EM15:   .ASCIZ  <15><12>#CLOCK B COUNT ERROR #
       027614  045503  041040  041440
       027622  052517  052116  042440
       027630  051122  051117  000040
 3765  027636  005015  046103  041517  EM16:   .ASCIZ  <15><12>#CLOCK A INTERRUPT ERROR #
       027644  020113  020101  047111
       027652  042524  051122  050125
       027660  020124  051105  047522
       027666  020122     000
 3766  027671     015  041412  047514  EM17:   .ASCIZ  <15><12>#CLOCK B INTERRUPT ERROR #
       027676  045503  041040  044440
       027704  052116  051105  052522
       027712  052120  042440  051122
       027720  051117  000040
 3767  027724  005015  046103  041517  EM20:   .ASCIZ  <15><12>#CLOCK A REPEATABILITY ERROR #
       027732  020113  020101  042522
       027740  042520  052101  041101
       027746  046111  052111  020131
       027754  051105  047522  020122
       027762     000
 3768  027763     015  041412  047514  EM23:   .ASCIZ  <15><12>#CLOCK B REPEATABILITY ERROR #
       027770  045503  041040  051040
       027776  050105  040505  040524
       030004  044502  044514  054524
       030012  042440  051122  051117
       030020  000040
 3769  030022  005015  046103  041517   EM26:   .ASCIZ  <15><12>#CLOCK ADDRESSING ERROR#
       030030  020113  042101  051104
       030036  051505  044523  043516
       030044  042440  051122  051117
       030052     000
 3770
 3771  030053     015  042412  051122   DH1:    .ASCIZ  <15><12>#ERRPC    ASR      WAS      S/B#
       030060  041520  020040  040440
       030066  051123  020040  020040
       030074  053440  051501  020040
       030102  020040  051440  041057
       030110     000
 3772  030111     015  042412  051122   DH3:    .ASCIZ  <15><12>#ERRPC    ABR      WAS      S/B#
       030116  041520  020040  040440
       030124  051102  020040  020040
       030132  053440  051501  020040
       030140  020040  051440  041057
       030146     000
 3773  030147     015  042412  051122   DH4:    .ASCIZ  <15><12>#ERRPC    ACR      WAS      S/B#
       030154  041520  020040  040440
       030162  051103  020040  020040
       030170  053440  051501  020040
       030176  020040  051440  041057
       030204     000
 3774  030205     015  042412  051122   DH5:    .ASCIZ  <15><12>#ERRPC    BSR      WAS      S/B#
       030212  041520  020040  041040
       030220  051123  020040  020040
       030226  053440  051501  020040
       030234  020040  051440  041057
       030242     000
 3775  030243     015  042412  051122   DH6:    .ASCIZ  <15><12>#ERRPC    BBR      WAS      S/B#
       030250  041520  020040  041040
       030256  051102  020040  020040
       030264  053440  051501  020040
       030272  020040  051440  041057
       030300     000
 3776  030301     015  042412  051122   DH7:    .ASCIZ  <15><12>#ERRPC    BCR      WAS      S/B#
       030306  041520  020040  041040
       030314  051103  020040  020040
       030322  053440  051501  020040
       030330  020040  051440  041057
       030336     000
 3777  030337     015  042412  051122   DH10:   .ASCII  <15><12>/ERROR    GOOD     BAD      GOOD     DATA READ FROM/
       030344  051117  020040  043440
       030352  047517  020104  020040
       030360  041040  042101  020040
       030366  020040  043440  047517
       030374  020104  020040  042040
       030402  052101  020101  042522
       030410  042101  043040  047522
       030416     115
 3778  030417     015  020012  050040           .ASCIZ  <15><12>/  PC     ADDR     ADDR     DATA     DUAL ADDRESS/
       030424  020103  020040  040440
       030432  042104  020122  020040
```

```
030440  040440  042104  020122
030446  020040  042040  052101
030454  020101  020040  042040
030462  040525  020114  042101
030470  051104  051505  000123
030476  005015  051105  050122  DH12:   .ASCIZ  <15><12>#ERRPC   ASR #
030504  020103  020040  051501
030512  020122     000
030515     015  042412  051122  DH14:   .ASCIZ  <15><12>#ERRPC   BSR#
030522  041520  020040  041040
030530  051123     000
030533     015  042412  051122  DH20:   .ASCIZ  <15><12>#ERRPC   ASR     2NDCNT  1STCNT #
030540  041520  020040  040440
030546  051123  020040  020040
030554  031040  042116  047103
030562  020124  030440  052123
030570  047103  020124     000
030575     015  042412  051122  DH23:   .ASCIZ  <15><12>#ERRPC   BSR     2NDCNT  1STCNT #
030602  041520  020040  041040
030610  051123  020040  020040
030616  031040  042116  047103
030624  020124  030440  052123
030632  047103  020124     000
030637     015  042412  051122  DH26:   .ASCIZ  <15><12>#ERRPC   CLOCK ADDR.#
030644  041520  020040  041440
030652  047514  045503  040440
030660  042104  027122     000

        030666                          .EVEN

030666  001116  001324  001126  DT1:    .WORD   $ERRPC,ASR,$BDDAT,$GDDAT,0
030674  001124  000000
030700  001116  001326  001126  DT3:    .WORD   $ERRPC,ABR,$BDDAT,$GDDAT,0
030706  001124  000000
030712  001116  001330  001126  DT4:    .WORD   $ERRPC,ACR,$BDDAT,$GDDAT,0
030720  001124  000000
030724  001116  001332  001126  DT5:    .WORD   $ERRPC,BSR,$BDDAT,$GDDAT,0
030732  001124  000000
030736  001116  001334  001126  DT6:    .WORD   $ERRPC,BBR,$BDDAT,$GDDAT,0
030744  001124  000000
030750  001116  001336  001126  DT7:    .WORD   $ERRPC,BCR,$BDDAT,$GDDAT,0
030756  001124  000000
030762  001116  001120  001122  DT10:   .WORD   $ERRPC,$GDADR,$BDADR,$GDDAT,$BDDAT,0
030770  001124  001126  000000
030776  001116  001324  000000  DT12:   .WORD   $ERRPC,ASR,0
031004  001116  001332  000000  DT14:   .WORD   $ERRPC,BSR,0
031012  001116  001330  001124  DT21:   .WORD   $ERRPC,ACR,$GDDAT,$TMP0,0
031020  001164  000000
031024  001116  001330  001126  DT22:   .WORD   $ERRPC,ACR,$BDDAT,$TMP0,0
031032  001164  000000
031036  001116  001336  001124  DT24:   .WORD   $ERRPC,BCR,$GDDAT,$TMP0,0
031044  001164  000000
031050  001116  001336  001126  DT25:   .WORD   $ERRPC,BCR,$BDDAT,$TMP0,0
031056  001164  000000
031062  001116  001164  000000  DT26:   .WORD   $ERRPC,$TMP0,0
```

```
031070  000000  000000          DFO:    .WORD   0,0



                                        ;*
                                        ;*THIS SUB CODE IS USED TO INITIALIZE THE LPA-11
                                        ;*FIRST WE WILL LOAD MICROCODE INTO KMC-11
                                        ;*NEXT WE WILL INIT BOTH UPROCESSORS
                                        ;*THEN WE WILL LOAD DEVICE TABLE IN SLAVE UP.
                                        ;*THE ORDER OF LOAD IS DETERMINED BY THE USER.
                                        ;*
                                        ;*      CALL=   JSR     R5,$LPAI
                                        ;*              .WORD   0               ;ADDR. OF DEVICE ADDRESS.
                                        ;* ROUTINES REQUIRED:   .LOADLP
                                        ;* PROGRAMS REQUIRED:   DRLPX2
                                        ;*

                                        ;*              ;RETURNS WITH $AERR=1 IF SLAVE
                                        ;*              ;MICRO SAYS AN ADDR. DOES NOT EXSIST. IN THE LIST.
                                        ;*
031074                          $LPAI:
031074  013746  000004                  MOV     4,-(SP)

031100  000413                          BR      31$             ;FIELD DOES NOT HAVE A BUS SWITCH TO
                                                                ;WORRY ABOUT,SO WE WILL UNCONDITIONALLY
                                                                ;BRANCH ARROUD THE NEXT CODE THAT
                                                                ;WORKS BASED ON A BUS SWITCH.
                                                                ;CODE LEFT IN HERE FOR IN HOUSE
                                                                ;PERSONAL WHO MAY PATCH THIS BRANCH
                                                                ;INSTRUCTION TO A <NOP> OCTAL <240>
                                                                ;IN ORDER TO RUN PROGRAM WITH A SWITCH.

                                                                ;NOTE THIS "SWITCH" IS A PIECE OF INHOUSE
                                                                ;TEST EQUIPMENT ONLY IT CONNECTS
                                                                ;THE UNIBUS TO THE I/O BUS FOR
                                                                ;CERTAIN TESTING.
031102  012737  031126  000004          MOV     #30$,4
031110  005237  170000                  INC     170000
031114  104401  031122                  TYPE    ,65$            ;;TYPE ASCIZ STRING
031120  000401                          BR      64$             ;;GET OVER THE ASCIZ
                                ;;65$:  .ASCIZ  <7>##
031124                          64$:
031124  000401                          BR      31$
031126  022626                  30$:    CMP     (SP)+,(SP)+
031130  012637  000004          31$:    MOV     (SP)+,4         ;ALL THIS JUNK MUST BE REMOVED!!
031134  005037  031562                  CLR     $AERR
031140  004537  031564                  JSR     R5,$LOAD        ;LOAD MICRO-CODE.
031144  000000G                         .WORD   DRLPX2          ;FILE "DRLPX2.OBJ"

031146  052777  040000  150462          BIS     #BIT14,@KMAD0   ;ISSUE KMC+DMC INIT.

031154                          1$:
                                                                ;"HANGS" HERE THEN KMC-11 ERROR.
031154  010146                          MOV     R1,-(SP)
031156  005001                          CLR     R1
031160  005201                  2$:     INC     R1              ;STALL FOR DMC-UP
```

```
(2)  031162  001376                                 BNE     2$
(2)  031164  012777  104000  150444                 MOV     #BIT15!BIT11,@KMAD0     ;SET RUN, AND ENABLE ARBITRATION.
(2)  031172  105201                         25$:    INCB    R1
(2)  031174  001376                                 BNE     25$
(2)
(2)  031176  032777  000040  150432                 BIT     #BIT5,@KMAD0    ;SLAVE READY? (READING IPBM SR)
(2)  031204  001401                                 BEQ     3$
(2)                                                                         ;FATAL LPA-11 ERROR SLAVE NOT READY.
(2)  031206  104000                                 ERROR
(2)
(2)  031210  012777  000004  150424         3$:     MOV     #4,@KMAD2       ;READ FAST PATH
(2)  031216                                 4$:
(3)  031216  004537  032474                         JSR     R5, $TOUT       ;-TOUT-CHECK FOR TIMEOUT
(3)
(3)  031222  104000                                 ERROR                   ;/TIME-OUT ERROR
(3)                                                                         ;/WE FAILED TO COMPLETE
(3)                                                                         ;/CURRENT OPERATION.
(3)                                                                         ;/CONTINUES IN THIS LOOP
(3)                                                                         ;/WOULD MAKE US ''HANG'' HERE
(3)
(3)  031224  000774                                 BR              4$
(3)
(3)                                                                         ;/RETURNS HERE-FROM-TIMED OUT.
(2)  031226  122777  000377  150406                 CMPB    #377,@KMAD2     ;WAIT TILL KMC DONE COMMAND.
(2)  031234  001370                                 BNE     4$
(2)  031236  122777  000377  150402                 CMPB    #377,@KMAD4     ;IF FAST PATH=377 THEN ERROR.
(2)  031244  001001                                 BNE     35$
(2)  031246  104000                                 ERROR                   ;IPBM ERROR (SLAVE SIDE)
(2)                                                                         ;YOU MUST RUN IPBM DIAGNOSTIC.
(2)
(2)  031250  117737  150372  031530         35$:    MOVB    @KMAD4,11$      ;GET THE VERSION NUMBER FROM DMC-11
(2)  031256  005227  177777                         INC     #-1
(2)  031262  001045                                 BNE     5$
(2)  031264  005227  177777                         INC     #-1
(2)  031270  001042                                 BNE     5$
(3)  031272  104401  031300                         TYPE    ,67$            ;;TYPE ASCIZ STRING
(3)  031276  000426                                 BR      66$             ;;GET OVER THE ASCIZ
(3)                                         ;;67$:  .ASCIZ  <200>''M8200-YC (DMC) MICROCODE VERSION NUMBER = '' .
(3)  031354                                 66$:
(2)  031354  013746  031530                         MOV     11$,-(SP)
(2)  031360  104403                                 TYPOS
(2)  031362     002     000                         .BYTE   2,0
(3)  031364  104401  031372                         TYPE    ,69$            ;;TYPE ASCIZ STRING
(3)  031370  000402                                 BR      68$             ;;GET OVER THE ASCIZ
(3)                                         ;;69$:  .ASCIZ  <200>''  ''
(3)  031376                                 68$:
(2)
(2)  031376  112737  177777  031530         5$:     MOVB    #0-1,11$        ;DAC CODE FOR SLAVE.
(2)  031404  012501                                 MOV     (5)+,R1         ;GET NEXT DEVICE ADDR.
(2)  031406  021127  000000                 6$:     CMP     (R1),#0         ;TERM REACHED?
(2)  031412  001444                                 BEQ     10$
(2)  031414  105237  031530                         INCB    11$
(2)  031420  113777  031530  150220                 MOVB    11$,@KMAD4      ;FIFO DATA
(2)  031426  004737  031532                         JSR     PC,20$          ;ISSUE SEND
(2)  031432  112177  150210                         MOVB    (R1)+,@KMAD4    ;SEND LOW BYTE OF DEVICE ADDR TO SLAVE.
(2)  031436  004737  031532                         JSR     PC,20$          ;ISSUE SEND
```

```
    (2)  031442  112177  150200                  MOVB    (R1)+,@KMAD4      ;SEND HIGH BYTE OF DEVICE ADDR. TO SLAVE.
    (2)  031446  004737  031532                  JSR     PC,20$
    (2)
    (2)  031452  032777  000002  150156  7$:     BIT     #BIT1,@KMAD0      ;WAIT FOR FIFO DATA
    (2)  031460  001374                          BNE     7$                ;=1 NO DATA. =0 DATA.
    (2)  031462  112777  000002  150152          MOVB    #2,@KMAD2         ;READ FIFO.
    (2)
    (2)  031470                          8$:
    (3)  031470  004537  032474                  JSR     R5, $TOUT         ;-TOUT-CHECK FOR TIMEOUT
    (3)
    (3)  031474  104000                          ERROR                     ;/TIME-OUT ERROR
    (3)                                                                    ;/WE FAILED TO COMPLETE
    (3)                                                                    ;/CURRENT OPERATION.
    (3)                                                                    ;/CONTINUES IN THIS LOOP
    (3)                                                                    ;/WOULD MAKE US "HANG" HERE
    (3)
    (3)  031476  000774                          BR              8$
    (3)
    (3)                                                                    ;/RETURNS HERE-FROM-TIMED OUT.
    (2)  031500  122777  000377  150134          CMPB    #377,@KMAD2       ;WAIT FOR READ.
    (2)  031506  001370                          BNE     8$
    (2)  031510  105777  150132                  TSTB    @KMAD4            ;WAS A ZERO RETURNED?
    (2)  031514  001734                          BEQ     6$                ;YES GET NEXT ADDR.
    (2)                                                                    ;SLAVE WILL RETURN CODE 0 IF
    (2)  031516  005237  031562                  INC     $AERR             ;DEV PRESENT.   ELSE
    (2)                                                                    ;EXIT $AERR=1 IF SLAVE GIVES ERROR.
    (2)  031522  005041                          CLR     -(1)              ;GET RID OF REFERENCE TO BAD ADDR.
    (2)  031524  012601                  10$:    MOV     (SP)+,R1
    (2)  031526  000205                          RTS     R5                ;RETURN ALL ADDR. CHECKED.
    (2)
    (2)  031530  000000                  11$:    .WORD   0                 ;HOLDS DAC CODE PLUS OFFSET
    (2)                                                                    ;TO SLAVES ADDR. TABLE.
    (2)
    (2)  031532  112777  000003  150102  20$:    MOVB    #3,@KMAD2         ;ISSUE FIFO WRITE
    (2)  031540                          21$:
    (3)  031540  004537  032474                  JSR     R5, $TOUT         ;-TOUT-CHECK FOR TIMEOUT
    (3)
    (3)  031544  104000                          ERROR                     ;/TIME-OUT ERROR
    (3)                                                                    ;/WE FAILED TO COMPLETE
    (3)                                                                    ;/CURRENT OPERATION.
    (3)                                                                    ;/CONTINUES IN THIS LOOP
    (3)                                                                    ;/WOULD MAKE US "HANG" HERE
    (3)
    (3)  031546  000774                          BR              21$
    (3)
    (3)                                                                    ;/RETURNS HERE-FROM-TIMED OUT.
    (2)  031550  122777  000377  150064          CMPB    #377,@KMAD2       ;KMC CODE WILL RETURN A "377"
    (2)  031556  001370                          BNE     21$               ;WHEN DONE COMMAND.
    (2)  031560  000207                          RTS     PC
    (2)
    (2)  031562  000000                  $AERR:  .WORD   0                 ;=0 IF ADDR. LIST OK,=1 IF BAD.
    (2)
    (2)                                          ;*
    (2)                                          ;*THIS SUB CODE USED TO LOAD MICRO-CODE INTO LPA-11.
    (2)                                          ;*      CALL =  JSR     R5,$LOAD
    (2)                                          ;*              .WORD   XX              ;ADDR. OF MICRO CODE.
```

```
  (2)                                        ;*            ;RETURNS HERE
  (2)                                        ;*      NOTE:  MICRO CODE FILE MUST END IN -1 DATA.
  (2)                                        ;*
  (2)
  (2)  031564  010446                  $LOAD: MOV     R4,-(SP)          ;SAVE R4.
  (2)  031566  010046                         MOV     R0,-(SP)          ;SAVE R0.
  (2)  031570  012500                  1$:    MOV     (5)+,R0           ;GET PROG. ADDR.
  (2)  031572  005077  150040                 CLR     @KMAD0            ;CLEAR CSR
  (2)  031576  005077  150044                 CLR     @KMAD4            ;CLEAR CRAM ADDR.
  (2)  031602  052777  002000  150026  2$:    BIS     #2000,@KMAD0      ;SELECT CRAM.
  (2)  031610  012077  150036                 MOV     (0)+,@KMAD6       ;WRITE DATA.
  (2)  031614  052777  020000  150014         BIS     #20000,@KMAD0     ;SET CRAM WRITE
  (2)  031622  005077  150010                 CLR     @KMAD0            ;DISABLE CRAM.
  (2)  031626  005277  150014                 INC     @KMAD4            ;UPDATE CRAM ADDR.
  (2)  031632  021027  177777                 CMP     (0),#-1           ;ALL DONE?
  (2)  031636  001361                         BNE     2$                ;NO LOOP.
  (2)  031640  005077  150002                 CLR     @KMAD4            ;CLEAR CRAM ADDR.
  (2)  031644  016500  177776                 MOV     -2(5),R0          ;GET MICRO CODE ADDR.
  (2)
  (2)  031650  052777  002000  147760  3$:    BIS     #2000,@KMAD0      ;SELECT CRAM
  (2)  031656  022077  147770                 CMP     (R0)+,@KMAD6      ;DATA OK?
  (2)  031662  001013                         BNE     5$                ;NO - REPORT AN ERROR.
  (2)  031664  021027  177777                 CMP     (0),#-1           ;ALL DONE?
  (2)  031670  001405                         BEQ     4$                ;YES - EXIT
  (2)  031672  005077  147740                 CLR     @KMAD0            ;NO - DESELECT CRAM.
  (2)  031676  005277  147744                 INC     @KMAD4            ;UPDATE CRAM ADDR.
  (2)  031702  000762                         BR      3$
  (2)
  (2)  031704  012600                  4$:    MOV     (SP)+,R0          ;RESTORE R0
  (2)  031706  012604                         MOV     (SP)+,R4          ;RESTORE R4
  (2)  031710  000205                         RTS     R5                ;EXIT
  (2)
  (2)  031712                          5$:                              ;COME HERE ON LOAD ERROR
  (2)  031712  005745                         TST     -(5)
  (2)  031714  105204                         INCB    R4                ;UPDATE ERROR COUNTER.
  (2)  031716  100324                         BPL     1$                ;IF NOT TOO MANY, TRY AGAIN.
  (2)  031720  000000                         HALT                      ;MICRO CODE LOAD ERROR.
  (2)                                                                   ;KMC-11 FAULT. YOU COULD TRY
  (2)  031722  000722                         BR      1$                ;TO PRESS CONTINUE TO GIVE IT
  (2)                                                                   ;ANOTHER CHANCE, BUT I DOUBT
  (2)                                                                   ;THAT THAT WOULD WORK. SINCE I'VE
  (2)                                                                   ;ALREADY GIVEN IT 177 (OCTAL) CHANCES.
  (2)                                                                   ;TRY RUNNING THE KMC-11 DIAGNOSTIC.
  (2)
  (2)
  (2)
  (2)                                        ;
  (2)                                        ;*THIS ROUTINE ISSUES A WRITE COMMAND TO THE LPA-11
  (2)                                        ;*
  (2)                                        ;*      CALL =  JSR     R5,$TLKW
  (2)                                        ;*              .WORD   0               ;OFFSET OF DEVICE ADDR.
  (2)                                        ;*              .WORD   0               ;DATA TO BE WRITTEN
  (2)                                        ;*
  (2)  031724  010046                  $TLKW: MOV     R0,-(SP)          ;SAVE R0
  (2)  031726  012500                         MOV     (5)+,R0           ;GET DEVICE OFFSET
  (2)  031730  052700  000340                 BIS     #340,R0           ;ADD WRITE CODE.
  (2)  031734  004737  032206                 JSR     PC,$LPW           ;WAIT FOR FAST PATH READY
```

```
(2)  031740  010037  032032                 MOV     R0,W1
(2)  031744  010077  147676                 MOV     R0,@KMAD4
(2)  031750  112777  000005  147664         MOVB    #5,@KMAD2        ;ISSUE FAST PATH WRITE
(2)  031756  004737  032206                 JSR     PC,$LPW          ;WAIT FOR RDY
(2)  031762  011537  032034                 MOV     (5),W2
(2)  031766  112577  147654                 MOVB    (5)+,@KMAD4      ;WRITE LOW BYTE DATA.
(2)
(2)  031772  112777  000005  147642         MOVB    #5,@KMAD2        ;FP WRITE
(2)  032000  004737  032206                 JSR     PC,$LPW
(2)  032004  111537  032036                 MOVB    (5),W3
(2)  032010  112577  147632                 MOVB    (5)+,@KMAD4      ;WRITE HIGH BYTE
(2)  032014  112777  000005  147620         MOVB    #5,@KMAD2
(2)  032022  004737  032206                 JSR     PC,$LPW
(2)  032026  012600                         MOV     (SP)+,R0
(2)  032030  000205                         RTS     R5               ;EXIT DONE.
(2)  032032  000000                 W1:     0
(2)  032034  000000                 W2:     0
(2)  032036  000000                 W3:     0
(2)
(2)                                         ;*
(2)                                         ;*THIS ROUTINE ISSUES A READ COMMAND TO THE LPA-11
(2)                                         ;*
(2)                                         ;*      CALL =  JSR     R5,$TLKR
(2)                                         ;*              .WORD   0               ;OFFSET OF DEVICE
(2)                                         ;*              ;RETURNS HERE
(2)                                         ;*DATA IN WORD $DATR
(2)                                         ;*
(2)
(2)  032040  010046                 $TLKR:  MOV     R0,-(SP)         ;SAVE R0
(2)  032042  012500                         MOV     (5)+,R0          ;GET OFFSET
(2)  032044  052700  000300                 BIS     #300,R0          ;ADD READ CODE
(2)  032050  004737  032206                 JSR     PC,$LPW          ;WAIT TILL READY
(2)  032054  110077  147566                 MOVB    R0,@KMAD4
(2)  032060  112777  000005  147554         MOVB    #5,@KMAD2        ;ISSUE WRITE FP
(2)  032066  004737  032206                 JSR     PC,$LPW
(2)  032072  010037  032202                 MOV     R0,RD1
(2)  032076                         1$:
(3)  032076  004537  032474                 JSR     R5, $TOUT        ;-TOUT-CHECK FOR TIMEOUT
(3)
(3)  032102  104000                         ERROR                    ;/TIME-OUT ERROR
(3)                                                                  ;/WE FAILED TO COMPLETE
(3)                                                                  ;/CURRENT OPERATION.
(3)                                                                  ;/CONTINUES IN THIS LOOP
(3)                                                                  ;/WOULD MAKE US "HANG" HERE
(3)
(3)  032104  000774                         BR              1$
(3)
(3)                                                                  ;/RETURNS HERE-FROM-TIMED OUT.
(2)  032106  032777  000040  147522         BIT     #BIT5,@KMAD0     ;FAST PATH GOT DATA?
(2)  032114  001370                         BNE     1$
(2)  032116  112777  000004  147516         MOVB    #4,@KMAD2        ;ISSUE FAST PATH READ
(2)  032124  004737  032206                 JSR     PC,$LPW
(2)  032130  117737  147512  032204         MOVB    @KMAD4,$DATR     ;GET LOW BYTE
(2)  032136                         2$:
(3)  032136  004537  032474                 JSR     R5, $TOUT        ;-TOUT-CHECK FOR TIMEOUT
(3)
```

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(3)  032142  104000                            ERROR                           ;/TIME-OUT ERROR
(3)                                                                            ;/WE FAILED TO COMPLETE
(3)                                                                            ;/CURRENT OPERATION.
(3)                                                                            ;/CONTINUES IN THIS LOOP
(3)                                                                            ;/WOULD MAKE US "HANG" HERE
(3)
(3)  032144  000774                            BR              2$
(3)
(3)                                                                            ;/RETURNS HERE-FROM-TIMED OUT.
(2)  032146  032777  000040  147462            BIT     #BIT5,@KMAD0            ;FAST PATH READY?
(2)  032154  001370                            BNE     2$
(2)  032156  112777  000004  147456            MOVB    #4,@KMAD2               ;ISSUE FAST PATH READ
(2)  032164  004737  032206                    JSR     PC,$LPW
(2)  032170  117737  147452  032205            MOVB    @KMAD4,$DATR+1          ;SAVE HIGH BYTE
(2)  032176  012600                            MOV     (SP)+,R0
(2)  032200  000205                            RTS     R5
(2)  032202  000000                    RD1:    0
(2)  032204  000000                    $DATR:  .WORD   0
(2)                                            ;
(2)                                            ;THIS ROUTINE WAITS FOR KMC-CODE TO BECOME READY AS WELL
(2)                                            ;AS FAST PATH TO BE READ.
(2)                                            ;
(2)                                            ;       CALL =  JSR     PC,$LPW
(2)                                            ;
(2)                                            ;IT WILL TIME OUT IF TOO MUCH TIME IS TAKEN BY
(2)                                            ;THE MICRO-PROCESSORS AND REPORT AN ERROR, THEN HALT.
(2)                                            ;
(2)
(2)  032206  010146                    $LPW:   MOV     R1,-(SP)                ;SAVE R1
(2)  032210  005001                            CLR     R1
(2)  032212  122777  000377  147422    1$:     CMPB    #377,@KMAD2             ;FINISHED INSTRUCTION?
(2)  032220  001403                            BEQ     2$
(2)  032222  005201                            INC     R1                      ;TIME OUT?
(2)  032224  001372                            BNE     1$
(2)  032226  000411                            BR      10$
(2)
(2)  032230  032777  000020  147400    2$:     BIT     #BIT4,@KMAD0            ;FAST PATH READ?
(2)  032236  001403                            BEQ     3$
(2)  032240  005201                            INC     R1                      ;NO - TIME OUT?
(2)  032242  001372                            BNE     2$
(2)  032244  000402                            BR      10$                     ;YES - REPORT AN ERROR
(2)
(2)  032246  012601                    3$:     MOV     (SP)+,R1                ;RESTORE R1
(2)  032250  000207                            RTS     PC                      ;EXIT
(2)
(2)  032252                            10$:
(3)  032252  104401  032260                    TYPE    ,65$                    ;;TYPE ASCIZ STRING
(3)  032256  000407                            BR      64$                     ;;GET OVER THE ASCIZ
(3)                                    ;;65$:  .ASCIZ  <200>#LPA-11 FAULT#
(3)  032276                            64$:
(2)
(2)  032276  000000                    11$:    HALT                            ;LPA-11 FAULT RUN LPA-11
(2)  032300  000776                            BR      11$                     ;DIAGNOSTICS.
(2)
(2)
(2)
```

```
(2)                                        ;*
(2)                                        ;*THIS ROUTINE PROVIDES THE LINKAGE FROM USER CODE TO
(2)                                        ;*A DEVICE ADDRESS ON THE I/O BUSS FOR WRITE ONLY.
(2)                                        ;*
(2)                                        ;* FIRST WE WILL DETERMINE IF THE ADDRESS HAS BEEN USED
(2)                                        ;* BEFORE. IF NOT WE HAVE TO INITIALIZE THE LPA WITH
(2)                                        ;* THAT ADDRESS.
(2)                                        ;* WHEN THE ADDR. IS KNOWN BY THE LPA, DO THE OUTPUT BY
(2)                                        ;* $TLKW
(2)                                        ;*
(2)
(2)  032302  010046                $OUTLP: MOV     R0,-(SP)        ;SAVE R0
(2)  032304  010146                        MOV     R1,-(SP)        ;SAVE R1
(2)
(2)  032306  012700  001664                MOV     #.DVLS,R0       ;PROGRAM DEFINED LIST.
(2)  032312  005001                        CLR     R1
(2)  032314  005710                1$:     TST     (0)             ;TERMINATOR REACHED?
(2)  032316  001421                        BEQ     10$             ;YES NEXT STEP.
(2)  032320  027520  000000                CMP     @(5),(0)+       ;MATCH WITH ADDR IN LIST?
(2)  032324  001402                        BEQ     2$
(2)  032326  005201                        INC     R1
(2)  032330  000771                        BR      1$
(2)
(2)  032332  010137  032350        2$:     MOV     R1,3$           ;SAVE OFFSET, DEVICE KNOWN.
(2)  032336  005725                        TST     (5)+
(2)  032340  013537  032352                MOV     @(5)+,4$        ;GET DATA TO BE WRITTEN
(2)  032344  004537  031724                JSR     R5,$TLKW        ;DO WRITE
(2)  032350  000000                3$:     .WORD   0               ;DEVICE OFFSET
(2)  032352  000000                4$:     .WORD   0               ;DATA TO BE WRITTEN.
(2)  032354  012601                        MOV     (SP)+,R1
(2)  032356  012600                        MOV     (SP)+,R0
(2)  032360  000205                        RTS     R5
(2)  032362  017520  000000        10$:    MOV     @(5),(0)+       ;SAVE ADDR.
(2)  032366  005010                        CLR     (0)
(2)  032370  004537  031074                JSR     R5,$LPAI
(2)  032374  001664                        .WORD   .DVLS
(2)  032376  000755                        BR      2$
(2)
(2)                                        ;*
(2)                                        ;*THIS ROUTINE PROVIDES THE LINKAGE FROM USER CODE
(2)                                        ;*TO A DEVICE ADDR. ON THE I/O BUSS FOR READ ONLY.
(2)                                        ;*
(2)                                        ;*FIRST WE WILL DETERMINE IF THE ADDRESS HAS BEEN
(2)                                        ;*USED BEFORE. IF NOT, WE HAVE TO INITIALIZE THE LPA
(2)                                        ;*WITH THE NEW ADDR.
(2)                                        ;*WHEN THE ADDR IS KNOWN WE CAN DO OUTPUT THROUGH
(2)                                        ;*$TLKR
(2)                                        ;*      CALL THROUGH    MOVEI   DATA,ADDR.
(2)                                        ;*               WHICH EQUALS:
(2)                                        ;*                      JSR     R5,$INLP
(2)                                        ;*                      .WORD   XX      ADDR OF DEVICE
(2)                                        ;*                      .WORD   YY      ADDR TO STORE READ DATA.
(2)
(2)  032400  010046                $INLP:  MOV     R0,-(SP)        ;SAVE R0
(2)  032402  010146                        MOV     R1,-(SP)        ;SAVE R1
(2)
```

```
    (2)   032404  012700  001664                MOV     #.DVLS,R0          ;PROG DEFINED ADDR. LIST.
    (2)   032410  005001                        CLR     R1
    (2)   032412  005710                1$:     TST     (0)                ;EOL REACHED?
    (2)   032414  001420                        BEQ     10$                ;YES - DEFINE NEW ADDR.
    (2)
    (2)   032416  027520  000000                CMP     @(5),(0)+          ;ADDR. MATCH?
    (2)   032422  001402                        BEQ     2$
    (2)   032424  005201                        INC     R1
    (2)   032426  000771                        BR      1$
    (2)
    (2)   032430  010137  032442        2$:     MOV     R1,3$              ;SAVE LIST OFFSET
    (2)   032434  005725                        TST     (5)+
    (2)   032436  004537  032040                JSR     R5,$TLKR           ;GO READ DEVICE
    (2)           032442                $OFS=.
    (2)   032442  000000                3$:     .WORD   0                  ;OFFSET OF DEVICE
    (2)
    (2)   032444  013735  032204                MOV     $DATR,@(5)+        ;STORE DATA.
    (2)   032450  012601                        MOV     (SP)+,R1           ;RESTORE R1
    (2)   032452  012600                        MOV     (SP)+,R0           ;RESTORE R2
    (2)   032454  000205                        RTS     R5                 ;EXIT
    (2)
    (2)   032456  017520  000000        10$:    MOV     @(5),(0)+
    (2)   032462  005010                        CLR     (0)
    (2)   032464  004537  031074                JSR     R5,$LPAI
    (2)   032470  001664                        .WORD   .DVLS
    (2)   032472  000756                        BR      2$
    (2)                                                 ;*
    (2)                                                 ;*$TOUT ROUTINE USED TO WATCH IF
    (2)                                                 ;*      WE'RE IN A LOOP TOO-LONG
    (2)                                                 ;*      CALL=   JSR R5, $TOUT
    (2)                                                 ;*              ERROR X     ;RETURNS HERE ON TIMEOUT
    (2)                                                 ;*              BR
    (2)                                                 ;*              ;RETURNS HERE NO ERROR
    (2)                                                 ;*
    (2)
    (2)   032474  020537  032530        $TOUT:  CMP     R5,$SAD            ;SAME ADDR?
    (2)   032500  001405                        BEQ     1$
    (2)   032502  010537  032530                MOV     R5,$SAD            ;NO-SAVE THIS ADDR.
    (2)   032506  005037  032532                CLR     $CNT               ;CLR CNT AT ADDR.
    (2)   032512  000403                        BR      2$
    (2)   032514  005237  032532        1$:     INC     $CNT               ;OVERFLOW?
    (2)   032520  100402                        BMI     3$                 ;YES-ERROR RETURN
    (2)   032522  062705  000004        2$:     ADD     #4,R5              ;NO-NON ERROR RETURN
    (2)   032526  000205                3$:     RTS     R5                 ;RETURN.
    (2)
    (2)   032530  000000                $SAD:   .WORD   0                  ;CONTAINS LOOP ADDR.
    (2)   032532  000000                $CNT:   .WORD   0                  ;# OF TIMES AT ADDR.
    (2)
    (2)                                         ;*
    (2)                                         ;* THIS ROUTINE REPLACES WHAT THE USER WOULD ORDINARILY
    (2)                                         ;*USE FOR A RESET.  FIRST,WE DO A RESET INSTRUCTION.
    (2)                                         ;*THEN WE CLR ".DVLST" WHICH FORCES US TO RESET BOTH THE
    (2)                                         ;*KMC AND DMC AS SOON AS A DEVICE IS REFERENCED.
    (2)                                         ;*
    (2)                                         ;*      CALL=JSR        PC,$RESET        ;REPLACES "RESET INSTRUCTION
    (2)                                         ;*              ;RETURNS HERE.
```

```
(2)                                              ;*
(2)   032534  000005                    $RESET:  RESET                   ;RESET THE WORLD.
(3)
(3)                                     ;*       MOV     @2$,1$  ;/READ DEVICE REG 2$,PUT DATA IN 1$.
(2)   032546  005737  031562                     TST     $AERR           ;IF NO ERROR,LOOP
(2)   032552  001004                             BNE     10$             ;THERE WAS AN ERROR.
(2)   032554  062737  000002  032570             ADD     #2,2$           ;UPDATE DEVICE ADDR.
(2)                                                                      ;YOU SEE ,WE HAVE TO PROTECT OUR SELF!
(2)                                                                      ;IF 2$ CONTAINED A VALID ADDR,WE
(2)                                                                      ;MUST KEEP TRYING UNTIL WE GENERATE
(2)                                                                      ;AN INVALID ADDR.
(2)   032562  000764                             BR      $RESET
(2)   032564                            10$:
(2)   032564  000207                             RTS     PC
(2)   032566  000000                    1$:      .WORD   0               ;JUNK LOC.
(2)   032570  160000                    2$:      .WORD   160000          ;DUMB ADDR. FORCES INIT OF DMC/KMC.
(2)
(2)
(2)                                              ;
(2)                                              ;SDELAY- ROUTINE TO GIVE A MINOR DELAY.
(2)                                              ;         IS NOT TIME DEPENDENT CODE SENCE
(2)                                              ;        NOT USED TO GET SPECIFIC TIME BUT
(2)                                              ;         JUST A LITTLE DELAY.
(2)
(2)                                              ;       THAT IS UNLESS A REAL TIME CLOCK IS PRESENT!
(2)                                              ;       THEN WE'LL GENERATE A TIME BETWEEN 16MS TO 32 MS
(2)                                              ;
(2)                                              ;
(2)                                              ;       CALL=   JSR PC,  SDELAY
(2)                                              ;
(2)   032572                            SDELAY:
(2)   032572  005737  032654                     TST     RTCCSR          ;CLOCK PRESENT?
(2)   032576  100016                             BPL     10$
(2)   032600  012737  000002  032644             MOV     #2,TIME
(2)   032606  052777  000115  000040             BIS     #115,@RTCCSR    ;START CLOCK
(2)   032614  005037  177776                     CLR     PS
(2)   032620  005737  032644            1$:      TST     TIME
(2)   032624  001375                             BNE     1$
(2)   032626  005077  000022                     CLR     @RTCCSR         ;STOP CLOCK
(2)
(2)   032632  000207                             RTS PC
(2)   032634  105237  032644            10$:     INCB    TIME
(2)   032640  001375                             BNE     10$
(2)   032642  000207                             RTS     PC
(2)
(2)   032644  000000                    TIME:    .WORD   0
(2)
(2)   032646  005337  032644            CLKINT:  DEC     TIME
(2)   032652  000002                             RTI
(2)   032654  000000                    RTCCSR:  .WORD   0               ;CLOCK CSR IF USED.
(2)                                              ;
(2)                                              ;*
(2)                                              ;*THIS MACRO ALLOWS THE OPERATOR TO TALK TO
(2)                                              ;*ANY DEVICE ON THE I/O BUS
(2)                                              ;*USER MUST START AT THIS ADDR.
(2)                                              ;*HE MUST SAY EITHER "E" FOR EXAMINE, OR "D" FOR DEPOSIT.
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```
(2)                                                ;*"E" IS DEFAULT.
(2)                                                ;*NEXT, HE MUST SUPPLY AN ADDR.
(2)                                                ;*NOTE IF ADDR. IS NOT FOUND ON I/O BUS, A HALT
(2)                                                ;*WILL OCCUR.
(2)
(2)  032656                              $UTK:
(2)  032656  005037  001664                        CLR     .DVLS
(2)  032662                              21$:
(3)  032662  104401  032670                        TYPE    ,65$            ;;TYPE ASCIZ STRING
(3)  032666  000405                                BR      64$             ;;GET OVER THE ASCIZ
(3)                                      ;;65$:    .ASCIZ  <200>#E OR D?#
(3)  032702                              64$:
(2)  032702  105777  146236              1$:       TSTB    @$TKS
(2)  032706  100375                                BPL     1$
(2)  032710  117737  146232  033032                MOVB    @$TKB,20$       ;GET INPUT
(2)  032716  104401  033032                        TYPE,   20$             ;ECHO, NEXT MESSAGE.
(2)  032722  142737  000240  033032                BICB    #240,20$        ;STRIP PARITY, LC
(2)  032730  104412                                RDOCT                   ;GET ADDR.
(2)  032732  012637  033030                        MOV     (SP)+,14$
(2)  032736  123727  033032  000104                CMPB    20$,#'D         ;DEPOSIT?
(2)  032744  001411                                BEQ     10$
(2)
(2)  032746  004537  032400                        JSR     R5,$INLP        ;GET DATA
(2)  032752  033030                      2$:       .WORD   14$
(2)  032754  032766                                .WORD   5$
(2)
(3)  032756  013746  032766                        MOV     5$,-(SP)        ;;SAVE 5$ FOR TYPEOUT
(3)  032762  104402                                TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
(2)  032764  000736                                BR      21$             ;LOOP.
(2)  032766  000000                      5$:       .WORD   0
(2)
(2)  032770                              10$:
(3)  032770  104401  032776                        TYPE    ,67$            ;;TYPE ASCIZ STRING
(3)  032774  000404                                BR      66$             ;;GET OVER THE ASCIZ
(3)                                      ;;67$:    .ASCIZ  <200>#DATA= #
(3)  033006                              66$:
(2)  033006  104412                                RDOCT
(2)  033010  012637  033026                        MOV     (SP)+,13$
(2)
(2)  033014  004537  032302              11$:      JSR     R5,$OUTLP       ;OUTPUT ROUTINE.
(2)  033020  033030                      12$:      .WORD   14$             ;DEVICE ADDR.
(2)  033022  033026                                .WORD   13$             ;DATA
(2)  033024  000716                                BR      21$
(2)
(2)  033026  000000                      13$:      .WORD   0
(2)  033030  000000                      14$:      .WORD   0
(2)  033032  100001  042504  044526      20$:      .ASCIZ  <1><200>#DEVICE ADDR= #
(2)  033040  042503  040440  042104
(2)  033046  036522  000040
(2)                                                .EVEN
(2)
(1)
(1)
(2)                                                ;
(2)                                                ;THIS ROUTINE LOOKS THROUGH CURENT .DVLS FOR A/D ADDR.
(2)                                                ;IF UNFOUND,GENERATES IT. THIS ROUTINE'S WHOLE PURPOSE IS
```

```
(2)                                          ;TO SET UP THE USER PROGRAM TO LINK TO FILE "DRLPX2" FOR
(2)                                          ;SAMPLE TAKEING PURPOSES.
(2)                                          :       TO TAKE SAMPLES, THE USER PROGRAM MUST SET UP
(2)                                          :       A/D CSR IN BSEL 4,AND 5.
(2)                                          :       (2) HE MUST CALL THIS ROUTINE:
(2)                                          :               JSR     R5,$PUTS        ;CALL SET UP ROUTINE.
(2)                                          :               .WORD   ADCSR           ;ADDR. OF A/D CSR.
(2)                                          :               ;RETURNS HERE ;KMC BSEL 3,6,7 PERMINENTLY SET UP
(2)                                          :                               ;(UNTILL ONE DOES A RESET)
(2)                                          :
(2)                                          :       (3)THE USER MUST PUT CODE 006 INTO KMC REG 2 TO
(2)                                          :          START CONVERSION  CAUTION*DO WITH MOVB INSTR.!
(2)                                          :       (4)MONITOR KMC REG 2 FOR CODE 377 (DRLPX2 IS DONE)
(2)                                          :       (5)READ KMC REG 4,5 FOR A/D RESULT.
(2)                                          :       (6) TO TAKE MORE SAMPLES,SIMPLY PUT A/D CSR INTO
(2)                                          :          BSEL 4,5 AND CODE 6 INTO BSEL 2.
(2)                                          :
(2) 033052 012537 033062          $PUTS:     MOV     (5)+,1$                 ;GET ADDR OF ADDR. OF A/D
(2) 033056 004537 032400                     JSR     R5,$INLP
(2) 033062 000000                 1$:        .WORD   0
(2) 033064 033160                            .WORD   10$
(2) 033066 113777 032442 146556              MOVB    $OFS,@KMAD6
(2) 033074 113777 032442 146552              MOVB    $OFS,@KMAD7
(2) 033102 013737 033062 033122              MOV     1$,2$
(2) 033110 062737 000002 033122              ADD     #2,2$
(2) 033116 004537 032400                     JSR     R5,$INLP
(2) 033122 000000                 2$:        .WORD   0
(2) 033124 033160                            .WORD   10$
(2) 033126 113777 032442 146510              MOVB    $OFS,@KMAD3
(2) 033134 152777 000340 146510              BISB    #340,@KMAD6
(2) 033142 152777 000300 146504              BISB    #300,@KMAD7
(2) 033150 152777 000300 146466              BISB    #300,@KMAD3
(2) 033156 000205                            RTS     R5
(2) 033160 000000                 10$:       .WORD   0
(2)

           042000                            .=42000
                                                     ;HERE RESIDES THE MICRO-CODE USED BY THE PROGRAM
           043000                            .=43000
                                                     ;FREE LOCATION AFTER THE MICRO-CODE

           000001                            .END
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                                                                      E 15
LPA-KW11K DIAGNOSTIC MD-11-CRLPG-C       MACY11 30G(1063)  24-OCT-80  09:38  PAGE 4
CRLPGC.P11     18-AUG-80 09:15           CROSS REFERENCE TABLE -- USER SYMBOLS                                            SEQ 0186

ABASE = 170404          1221#   1279
ABR     001326          1279#   1462*   1518    1548    1549    1576    1577    1778    1797    1825    1853    2040    2092
                        2150    2202    2281    2282    2283    2284    2285    2286    2304    2350    2356    2391    2431
                        2548    2549    2593    2594    2618    2672    2685    2735    3084    3148    3258    3259    3260
                        3261    3520    3615    3788
ACDW1 = 000000          1279
ACDW2 = 000000          1279
ACPUOP= 000000          1279
ACR     001330          1279#   1464*   1518    1801    1826    1854    2052    2109    2219    2281    2282    2283    2284
                        2285    2286    2312    2360    2437    2593    2594    2622    2699    2742    2987    3096    3155
                        3258    3259    3260    3261    3527    3789    3796    3797
ADDW0 = 000000          1279
ADDW1 = 000000          1279
ADDW10= 000000          1279
ADDW11= 000000          1279
ADDW12= 000000          1279
ADDW13= 000000          1279
ADDW14= 000000          1279
ADDW15= 000000          1279
ADDW2 = 000000          1279
ADDW3 = 000000          1279
ADDW4 = 000000          1279
ADDW5 = 000000          1279
ADDW6 = 000000          1279
ADDW7 = 000000          1279
ADDW8 = 000000          1279
ADDW9 = 000000          1279
ADEVCT= 000000          1279
ADEVM = 000000          1279
AENV  = 000000          1279
AENVM = 000000          1279
AFATAL= 000000          1279
AMADR1= 000000          1279
AMADR2= 000000          1279
AMADR3= 000000          1279
AMADR4= 000000          1279
AMAMS1= 000000          1279
AMAMS2= 000000          1279
AMAMS3= 000000          1279
AMAMS4= 000000          1279
AMSGAD= 000000          1279
AMSGLG= 000000          1279
AMSGTY= 000000          1279
AMTYP1= 000000          1279
AMTYP2= 000000          1279
AMTYP3= 000000          1279
AMTYP4= 000000          1279
APASS = 000000          1279
APRIOR= 000006          1223#   1279
APRITY  001350          1279#   1480
APTCSU= 000040          3744    3745#
APTENV= 000001          3738    3744    3745#
APTSIZ= 000200          1444    3745#
APTSPO= 000100          3744    3745#
ASR     001324          1279#   1450*   1460    1518    1609    1610    1620    1778    1796    1820    1844    1971    1972
                        1976    1979    2004    2005    2007    2008    2020    2039    2046    2047    2049    2091    2099
```

```
                    2102    2104    2148    2154    2155    2157    2160    2170    2194    2204    2205    2207    2210
                    2281    2282    2283    2284    2285    2286    2303    2306    2316    2349    2352    2389    2393
                    2394    2396    2397    2429    2433    2434    2436    2474    2481    2482    2484    2486    2548
                    2549    2593    2594    2616    2619    2621    2670    2676    2677    2679    2731    2737    2745
                    2754    2791    2793    2834    2855    2857    2905    2913    2915    2949    2976    2980    3048
                    3049    3050    3051    3052    3053    3082    3092    3093    3095    3146    3149    3151    3258
                    3259    3260    3261    3362    3363    3364    3365    3458    3466    3469    3472    3509    3522
                    3523    3525    3564    3567    3569    3580    3612    3619    3622    3632    3665    3670    3687
                    3787    3794
ASWREG= 000000      1279
ATESTN= 000000      1279
AUNIT = 000000      1279
AUSWR = 000000      1279
AVECP2  001342      1279#   1474*
AVECT   001340      1279#   1472
AVECT1= 000344      1222#   1279    1439
AVECT2= 000000      1279
BBR     001334      1279#   1468*   1518    1660    1661    1778    1882    1909    1937    2784    2843    2908    2952
                    2978    3048    3049    3050    3051    3052    3053    3086    3362    3363    3364    3365    3668
                    3791
BCR     001336      1279#   1470*   1518    1886    1912    1940    2794    2861    2925    2958    3048    3049    3050
                    3051    3052    3053    3362    3363    3364    3365    3792    3798    3799
BIT0  = 000001      1220#   1778    2789    3145
BIT00 = 000001      1220#   2009    2211    2398
BIT01 = 000002      1220#
BIT02 = 000004      1220#
BIT03 = 000010      1220#
BIT04 = 000020      1220#
BIT05 = 000040      1220#   2161    2281    2282    2283    2284    2285    2286    2317    3623
BIT06 = 000100      1220#
BIT07 = 000200      1220#   2171    2487    3678
BIT08 = 000400      1220#   3741
BIT09 = 001000      1220#   3738    3741
BIT1  = 000002      1220#   1778    2789    3805
BIT10 = 002000      1220#   1778    2483    2548    2549    2593    2594    2620    3468    3738
BIT11 = 004000      1220#   1778    2732    2779    2792    2836    2856    2914    3094    3258    3259    3260    3261
                    3362    3363    3364    3365    3805
BIT12 = 010000      1220#   1778    1975    2006    2048    2103    2156    2206    2395    2435    2678    3150    3524
                    3568
BIT13 = 020000      1220#   1778    2003    3482    3536    3588    3641    3696    3738
BIT14 = 040000      1220#   1778    2123    2875    3741    3805
BIT15 = 100000      1220#   1778    3473    3805
BIT2  = 000004      1220#   1778
BIT3  = 000010      1220#   1778
BIT4  = 000020      1220#   1778    3805
BIT5  = 000040      1220#   1778    2789    3362    3363    3364    3365    3805
BIT6  = 000100      1220#   1778
BIT7  = 000200      1220#   1778
BIT8  = 000400      1220#   1778    3521
BIT9  = 001000      1220#   1778    3521    3568
BPRITY  001352      1279#   1480*
BPTVEC= 000014      1220#
BSR     001332      1279#   1466*   1518    1635    1636    1778    1881    1902    1930    2346    2470    2548    2549
                    2669    2674    2713    2733    2780    2788    2790    2837    2848    2850    2906    2910    2912
                    2916    2950    2977    3048    3049    3050    3051    3052    3053    3083    3088    3090    3258
                    3259    3260    3261    3362    3363    3364    3365    3458    3467    3509    3564    3612    3665
```

```
                        3676    3677    3790    3795
BVECT    001344         1279#   1476*
BVECT2   001346         1279#   1478*
CKSWR =  104407         3738    3741    3751#
CLKINT   032646         3805#
CR    =  000015         1220#   3744
CRLF  =  000200         1220#   3744
DDISP =  177570         1220#   1279    1444
DFO      031070         1290    1297    1304    1311    1318    1325    1332    1340    1347    1354    1358    1359    1360
                        1361    1368    1375    1382    1389    1396    1403    1410    1417    1424    1431    1438    3802#
DH1      030053         1288    1295    3771#
DH10     030337         1337    3777#
DH12     030476         1352    1380    3779#
DH14     030515         1366    1387    3780#
DH20     030533         1394    3781#
DH23     030575         1415    3782#
DH26     030637         1436    3783#
DH3      030111         1302    3772#
DH4      030147         1309    1345    1401    1408    3773#
DH5      030205         1316    3774#
DH6      030243         1323    3775#
DH7      030301         1330    1373    1422    1429    3776#
DISPLA   001142         1279#   1444*   3738*   3741*
DISPRE   000174         1209#   1444
DRLPX2=  ****** G         52#   3805
DSWR  =  177570         1220#   1279    1444
DT1      030666         1289    1296    1395    1416    3787#
DT10     030762         1339    3793#
DT12     030776         1353    1381    3794#
DT14     031004         1367    1388    3795#
DT21     031012         1402    3796#
DT22     031024         1409    3797#
DT24     031036         1423    3798#
DT25     031050         1430    3799#
DT26     031062         1437    3800#
DT3      030700         1303    3788#
DT4      030712         1310    1346    3789#
DT5      030724         1317    3790#
DT6      030736         1324    3791#
DT7      030750         1331    1374    3792#
EMTVEC=  000030         1220#   1444*
EM1      027166         1287    3753#
EM10     027433         1336    3760#
EM11     027460         1344    1400    1407    3761#
EM12     027507         1351    3762#
EM14     027547         1365    3763#
EM15     027607         1372    1421    1428    3764#
EM16     027636         1379    3765#
EM17     027671         1386    3766#
EM2      027221         1294    3754#
EM20     027724         1393    3767#
EM23     027763         1414    3768#
EM26     030022         1435    3769#
EM3      027250         1301    3755#
EM4      027277         1308    3756#
EM5      027326         1315    3757#
```

```
EM6       027355            1322      3758#
EM7       027404            1329      3759#
ERRVEC= 000004              1220#     1444*     3741*
GNS    = ****** U           1209      1448      3482      3536      3588      3641      3696      3706      3710      3751      3752      3805
GTSWR  = 104406             3751#
HT     = 000011             1220#     3744
IOTRD     023700            3703#     3752
IOTT   = 104413             3752#
IOTVEC= 000020              1220#     1444*
KMAD0     001636            1439#     1454      3805*
KMAD1     001640            1439#     1454
KMAD2     001642            1439#     3805*
KMAD3     001644            1439#     3805*
KMAD4     001646            1439#     3805*
KMAD5     001650            1439#
KMAD6     001652            1439#     3805*
KMAD7     001654            1439#     1454      3805*
LF     = 000012             1220#     3744
LOOP      002334            1456#     3395
LPADH     001650            1439#
LPADL     001646            1439#
LPCI      001636            1439#
LPCO      001642            1439#
LPMR      001640            1439#
LPMS1     001652            1439#
LPMS2     001654            1439#
LPSO      001644            1439#
LS210     022450            1214      3457#
LS214     022646            1215      3508#
LS220     023062            1216      3563#
LS224     023246            1217      3611#
LS230     023454            1218      3664#
P      = 000012             1778#     2548#     2549#
PIRQ   = 177772             1220#
PIRQVE= 000240              1220#
PR0    = 000000             1220#
PR1    = 000040             1220#
PR2    = 000100             1220#
PR3    = 000140             1220#
PR4    = 000200             1220#
PR5    = 000240             1220#
PR6    = 000300             1220#
PR7    = 000340             1220#
PS     = 177776             1220#     3805*
PSW    = 177776             1220#
PWRMSG    027034            3746      3747#
PWRVEC= 000024              1220#     1444*     3746*
RDCHR  = 104410             3743      3751#
RDLIN  = 104411             3742      3751#
RDOCT  = 104412             3751#     3805
RD1       032202            3805#*
RESVEC= 000010              1220#
RSTART    002462            1213      1482#
RTCCSR    032654            3805#*
SDELAY    032572            3805#
SSTART    002466            1481      1483#
```

```
STACK = 001100          1220#   1444    1483
START   001726          1211    1444#   3746
STKLMT= 177774          1220#
SWR     001140          1279#   1444*   2123    2875    3482    3536    3588    3641    3696    3738    3741    3743*   3746*
SWREG   000176          1209#   1444    3743
SW0   = 000001          1220#
SW00  = 000001          1220#
SW01  = 000002          1220#
SW02  = 000004          1220#
SW03  = 000010          1220#
SW04  = 000020          1220#
SW05  = 000040          1220#
SW06  = 000100          1220#
SW07  = 000200          1220#
SW08  = 000400          1220#
SW09  = 001000          1220#
SW1   = 000002          1220#
SW10  = 002000          1220#
SW11  = 004000          1220#
SW12  = 010000          1220#
SW13  = 020000          1220#
SW14  = 040000          1220#
SW15  = 100000          1220#
SW2   = 000004          1220#
SW3   = 000010          1220#
SW4   = 000020          1220#
SW5   = 000040          1220#
SW6   = 000100          1220#
SW7   = 000200          1220#
SW8   = 000400          1220#
SW9   = 001000          1220#
TBITVE= 000014          1220#
TIME    032644          3805#*
TKVEC = 000060          1220#
TPVEC = 000064          1220#
TRAPVE= 000034          1220#   1444*
TRTVEC= 000014          1220#
TST1    002504          1518#
TST10   003154          1778#
TST100  012172          2281#
TST101  012304          2282#
TST102  012416          2283#
TST103  012530          2284#
TST104  012642          2285#
TST105  012754          2286#
TST106  013066          2297#
TST107  013176          2339#
TST11   003254          1778#
TST110  013312          2379#
TST111  013434          2418#
TST112  013554          2467#
TST113  013674          2548#
TST114  014054          2549#
TST115  014234          2593#
TST116  014354          2594#
TST117  014474          2607#
```

```
TST12   003354          1778#
TST120  014600          2651#
TST121  015016          2724#
TST122  015164          2776#
TST123  015314          2827#
TST124  015522          2893#
TST125  015712          2943#
TST126  016006          2968#
TST127  016106          3048#
TST13   003454          1778#
TST130  016226          3049#
TST131  016346          3050#
TST132  016466          3051#
TST133  016606          3052#
TST134  016726          3053#
TST135  017046          3064#
TST136  017240          3136#
TST137  017352          3258#
TST14   003554          1778#
TST140  017642          3259#
TST141  020132          3260#
TST142  020422          3261#
TST143  020712          3362#
TST144  021216          3363#
TST145  021522          3364#
TST146  022026          3365#
TST15   003654          1778#
TST16   003754          1778#
TST17   004054          1778#
TST2    002602          1542#
TST20   004154          1778#
TST21   004254          1778#
TST22   004354          1778#
TST23   004454          1778#
TST24   004554          1778#
TST25   004654          1778#
TST26   004754          1778#
TST27   005054          1778#
TST3    002642          1571#
TST30   005154          1778#
TST31   005254          1778#
TST32   005354          1778#
TST33   005454          1778#
TST34   005554          1778#
TST35   005654          1778#
TST36   005754          1778#
TST37   006054          1778#
TST4    002700          1604#
TST40   006154          1778#
TST41   006254          1778#
TST42   006354          1778#
TST43   006454          1778#
TST44   006554          1778#
TST45   006654          1778#
TST46   006754          1778#
TST47   007054          1778#
```

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TST5      002754          1630#
TST50     007154          1778#
TST51     007254          1778#
TST52     007354          1778#
TST53     007454          1778#
TST54     007554          1778#
TST55     007654          1778#
TST56     007754          1778#
TST57     010054          1778#
TST6      003014          1655#
TST60     010154          1778#
TST61     010254          1778#
TST62     010354          1778#
TST63     010454          1778#
TST64     010554          1789#
TST65     010626          1812#
TST66     010704          1840#
TST67     010762          1874#
TST7      003054          1778#
TST70     011034          1898#
TST71     011112          1926#
TST72     011170          1968#
TST73     011254          1998#
TST74     011360          2034#
TST75     011502          2083#
TST76     011656          2144#
TST77     012024          2190#
TYPDS  =  104405          3395     3751#
TYPE   =  104401          1448     3395     3482     3536     3588     3641     3696     3706     3710     3737     3738     3739     3740
                          3743     3744     3746     3751#    3805
TYPOC  =  104402          3708     3716     3739     3743     3751#    3805
TYPON  =  104404          3751#
TYPOS  =  104403          3751#    3805
VECTOR    001656          1439#
VECTPS    001660          1439#
VERSN     001662          1439#
W1        032032          3805#*
W2        032034          3805#*
W3        032036          3805#*
$AERR     031562          3805#*
$APTHD    001000          1277#
$ASTAT=   ****** U        3745
$ATYC     026440          3745#
$ATY1     026414          3745#
$ATY3     026422          3744     3745#
$ATY4     026432          3738     3745#
$AUTOB    001134          1279#    1445     3743
$BASE     001254          1279#    1450
$BDADR    001122          1279#    3793
$BDDAT    001126          1279#    1518     1549     1550     1577     1578     1610     1611     1636     1637     1661     1662     1778
                          1801     1802     1826     1828     1854     1856     1886     1887     1912     1914     1940     1942     1979
                          1980     2008     2009     2052     2053     2109     2111     2160     2161     2170     2171     2219     2220
                          2281     2282     2283     2284     2285     2286     2312     2313     2316     2317     2346     2347     2360
                          2361     2397     2398     2437     2438     2470     2471     2486     2487     2548     2549     2593     2594
                          2622     2623     2685     2686     2699     2700     2742     2743     2745     2746     2794     2795     2861
                          2863     2916     2917     2925     2926     2958     2959     2987     2988     3048     3049     3050     3051
```

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                        3052     3053     3096     3097     3155     3156     3258     3259     3260     3261     3362     3363     3364
                        3365     3527     3528     3580     3581     3632     3633     3687     3688     3787     3788     3789     3790
                        3791     3792     3793     3797     3799
$BELL    001170         1279#    3738
$CDW1    001260         1279#
$CDW2    001262         1279#
$CHARC   026410         3744#*
$CKSWR   025356         3743#    3751
$CMTAG   001100         1279#    1444
$CM1   = 000001         1279#
$CM2   = 000002         1279#
$CM3   = 000001         1279#
$CM4   = 000001         1279#
$CNT     032532         3805#*
$CNTLG   026103         3743#
$CNTLU   026076         3743#
$CPUOP   001226         1279#
$CRLF    001175         1279#    3738     3739     3743     3744
$DATR    032204         3805#*
$DBLK    025052         3740#
$DDW0    001264         1279#
$DDW1    001266         1279#
$DDW10   001310         1279#
$DDW11   001312         1279#
$DDW12   001314         1279#
$DDW13   001316         1279#
$DDW14   001320         1279#
$DDW15   001322         1279#
$DDW2    001270         1279#
$DDW3    001272         1279#
$DDW4    001274         1279#
$DDW5    001276         1279#
$DDW6    001300         1279#
$DDW7    001302         1279#
$DDW8    001304         1279#
$DDW9    001306         1279#
$DEVCT   001210         1279#    1451*
$DEVM    001256         1279#
$DOAGN   022424         3395#
$DTBL    025042         3740#
$ENDAD   022414         1275     3395#    3738
$ENDCT   022362         1444     3395#
$ENDMG   022433         3395#
$ENULL   022430         3395#
$ENV     001220         1279#    3738     3744     3745
$ENVM    001221         1279#    1444     3744     3745
$EOP     022332         3395#
$EOPCT   022354         1444*    3395#
$ERFLG   001103         1279#    3738*    3741*
$ERMAX   001115         1279#    1444*    3741*
$ERROR   024302         1444     3738#
$ERRPC   001116         1279#    3738*    3739     3787     3788     3789     3790     3791     3792     3793     3794     3795     3796
                        3797     3798     3799     3800
$ERRTB   001356         1279#    3739
$ERRTY   024502         3738     3739#
$ERTTL   001112         1279#    3738*
```

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                                                                  M 15
LPA-KW11K DIAGNOSTIC MD-11-CRLPG-C      MACY11 30G(1063)  24-OCT-80  09:38  PAGE 4-8
CRLPGC.P11     18-AUG-80 09:15          CROSS REFERENCE TABLE -- USER SYMBOLS                                    SEQ 0194

$ESCAP   001166          1279#   1444*   3738    3741*
$ETABL   001220          1279#
$ETEND   001324          1277    1279#
$FATAL   001202          1279#   3745*
$FFLG    026660          3745#*
$FILLC   001156          1279#   3744
$FILLS   001155          1279#   3744
$GDADR   001120          1279#   3793
$GDDAT   001124          1279#   1547*   1548    1573*   1576    1606*   1609    1619*   1620    1632*   1635    1657*   1660
                         1778*   1795*   1796    1797    1799*   1819*   1820    1822*   1825    1828    1843*   1844    1850*
                         1853    1856    1880*   1881    1882    1884*   1901*   1902    1908*   1909    1914    1929*   1930
                         1936*   1937    1942    1970*   1971    1972    1975*   1976    2003*   2004    2005    2006*   2007
                         2019*   2020    2038*   2039    2040    2045*   2046    2047    2048*   2049    2050*   2053    2085*
                         2092    2106*   2111    2120    2125*   2147*   2148    2149*   2150    2153*   2154    2155    2156*
                         2157    2193*   2194    2201*   2202    2203*   2204    2205    2206*   2207    2281*   2282*   2283*
                         2284*   2285*   2286*   2302*   2303    2304    2305*   2306    2348*   2349    2350    2351*   2352
                         2355*   2356    2388*   2389    2390*   2391    2392*   2393    2428*   2429    2430*   2431    2432*
                         2433    2434    2435*   2436    2473*   2474    2480*   2481    2482    2483*   2484    2548*   2549*
                         2593*   2594*   2615*   2616    2617*   2618    2619    2620*   2621    2668*   2669    2670    2671*
                         2672    2673*   2674    2675*   2676    2677    2678*   2679    2683*   2712*   2713    2730*   2731
                         2732*   2733    2734*   2735    2736*   2737    2753*   2754    2779*   2780    2783*   2784    2788
                         2789*   2790    2791    2792*   2793    2829*   2843    2858*   2863    2872    2877*   2904*   2905
                         2906    2907*   2908    2909*   2910    2911*   2912    2913    2914*   2915    2948*   2949    2950
                         2951*   2952    2956*   2975*   2976    2977    2978    2979*   2980    3048*   3049*   3050*   3051*
                         3052*   3053*   3081*   3082    3083    3084    3085*   3086    3087*   3088    3089*   3090    3091*
                         3092    3093    3094*   3095    3147*   3148    3149    3150*   3151    3153*   3156    3258*   3259*
                         3260*   3261*   3362*   3363*   3364*   3365*   3787    3788    3789    3790    3791    3792    3793
                         3796    3798
$GET42   022404          3395#
$GTSWR   025426          3743#   3751
$HD    = 000001          1207
$HIBTS   001000          1277#
$HIOCT   025354          3742#*
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                         2219    2281    2282    2283    2284    2285    2286    2312    2316    2346    2360    2394    2397
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                         2699    2742    2745    2788    2791    2794    2855    2861    2913    2916    2925    2958    2987
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$LPERR   001110          1279#   1444*   3738    3741*
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$MAMS4   001244          1279#
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$MFLG    026656          3745#*
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$MSGLG   001216          1279#   3745*
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$MSWR    026110          3743#
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$MTYP2   001235          1279#
$MTYP3   001241          1279#
$MTYP4   001245          1279#
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                         2339#   2379#   2418#   2467#   2548#   2549#   2593#   2594#   2607#   2651#   2724#   2776#   2827#
                         2893#   2943#   2968#   3048#   3049#   3050#   3051#   3052#   3053#   3064#   3136#   3258#   3259#
                         3260#   3261#   3362#   3363#   3364#   3365#
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                         1881    1882    1902    1909    1930    1937    1971    1976    2004    2007    2020    2039    2040
                         2046    2049    2091    2092    2099    2104    2148    2150    2154    2157    2194    2202    2204
                         2207    2281    2282    2283    2284    2285    2286    2303    2304    2306    2349    2350    2352
                         2356    2389    2391    2393    2396    2429    2431    2433    2436    2474    2481    2484    2548
                         2549    2593    2594    2616    2618    2621    2669    2670    2672    2674    2676    2679    2713
                         2731    2733    2735    2737    2754    2780    2784    2790    2793    2834    2837    2843    2848
                         2850    2857    2905    2906    2908    2910    2912    2915    2949    2950    2952    2976    2977
                         2978    2980    3048    3049    3050    3051    3052    3053    3082    3083    3084    3086    3088
                         3090    3092    3095    3146    3148    3151    3258    3259    3260    3261    3362    3363    3364
                         3365    3458    3466    3467    3469    3509    3520    3522    3525    3564    3569    3612    3615
                         3619    3665    3668    3670    3676    3805#
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$PWRDN   026662          1444    3746#
$PWRMG   027016          3746#
$PWRUP   026734          3746#
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$RDOCT   025254          3742#   3751
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                        2283     2284     2285     2286     2297     2339     2379     2418     2467     2548     2549     2593     2594
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                        3741     3746
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$TRPAD   027136         3751#
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$TYPEC   026344         3743     3744#
$TYPEX   026412         3744#
$TYPOC   024100         3737#    3751
$TYPON   024114         3737#    3751
$TYPOS   024054         3737#    3751
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$UNITM   001010         1277#
$USWR    001224         1279#
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$$GET4=  000000            3395#
$OFILL   024277            3737#*
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                           3807#    3809#
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                                                        D 16
LPA-KW11K DIAGNOSTIC MD-11-CRLPG-C       MACY11 30G(1063)  24-OCT-80  09:38  PAGE 5
CRLPGC.P11     18-AUG-80 09:15           CROSS REFERENCE TABLE -- MACRO NAMES                                              SEQ 0198

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CADTB     3288#   3362    3363    3364    3365
CBC       1778#
CBTC      2558#   2593    2594
CBT25     2494#   2548    2549
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          2114    2118    2163    2166    2174    2179    2213    2216    2223    2231    2281    2282    2283    2284    2285
          2286    2321    2326    2363    2367    2400    2403    2440    2452    2489    2491    2548    2549    2593    2594
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          2932    2962    2965    2990    2994    3048    3049    3050    3051    3052    3053    3100    3111    3159    3165
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          3639    3690    3694    3724    3730
CSRDTA    1680#   1778
DFC       1280#   1290    1297    1304    1311    1318    1325    1332    1340    1347    1354    1368    1375    1382    1396
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          3639    3690    3694    3724    3730
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          2286    2321    2326    2363    2367    2400    2403    2440    2452    2489    2491    2548    2549    2593    2594
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          3364    3365    3478    3532    3584    3636    3691    3805
ESCAPE    1220#
GETPRI    1220#
GETSWR    1220#
MOVEI      170#   1518    1549    1577    1610    1636    1661    1778    1801    1826    1854    1886    1912    1940    1972
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          2283    2284    2285    2286    2312    2316    2346    2360    2394    2397    2434    2437    2470    2482    2486
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          3155    3258    3259    3260    3261    3362    3363    3364    3365    3472    3523    3527    3567    3580    3622
          3632    3677    3687    3805
MOVEM      157#   1548    1576    1609    1620    1635    1660    1778    1796    1797    1820    1825    1844    1853    1881
          1882    1902    1909    1930    1937    1971    1976    2004    2007    2020    2039    2040    2046    2049    2091
          2092    2099    2104    2148    2150    2154    2157    2194    2202    2204    2207    2281    2282    2283    2284
          2285    2286    2303    2304    2306    2349    2350    2352    2356    2389    2391    2393    2396    2429    2431
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         2433   2436   2474   2481   2484   2548   2549   2593   2594   2616   2618   2621   2669   2670   2672
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         2978   2980   3048   3049   3050   3051   3052   3053   3082   3083   3084   3086   3088   3090   3092
         3095   3146   3148   3151   3258   3259   3260   3261   3362   3363   3364   3365   3458   3466   3467
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         3051   3052   3053   3064   3136   3258   3259   3260   3261   3362   3363   3364   3365   3450   3502
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NEWTST   1220#  1518   1542   1571   1604   1630   1655   1778   1789   1812   1840   1874   1898   1926   1968
         1998   2034   2083   2144   2190   2281   2282   2283   2284   2285   2286   2297   2339   2379   2418
         2467   2548   2549   2593   2594   2607   2651   2724   2776   2827   2893   2943   2968   3048   3049
         3050   3051   3052   3053   3064   3136   3258   3259   3260   3261   3362   3363   3364   3365
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POPSP2   1246#
PUSH     1220#  3740   3742   3745   3746
REPORT   1220#
RTM      2233#  2281   2282   2283   2284   2285   2286
SCOPE    1220#  1542   1571   1604   1630   1655   1778   1789   1812   1840   1874   1898   1926   1968   1998
         2034   2083   2144   2190   2281   2282   2283   2284   2285   2286   2297   2339   2379   2418   2467
         2548   2549   2593   2594   2607   2651   2724   2776   2827   2893   2943   2968   3048   3049   3050
         3051   3052   3053   3064   3136   3258   3259   3260   3261   3362   3363   3364   3365
SETPRI   1220#
SETTRA   3751#  3752
SETUP    1220#  1444
SKIP     1220#
SLASH    1220#
SPACE    1220#
STARS    1220#  1275   1277   1279   1518   1542   1571   1604   1630   1655   1778   1789   1812   1840   1874
         1898   1926   1968   1998   2034   2083   2144   2190   2281   2282   2283   2284   2285   2286   2297
         2339   2379   2418   2467   2548   2549   2593   2594   2607   2651   2724   2776   2827   2893   2943
         2968   3048   3049   3050   3051   3052   3053   3064   3136   3258   3259   3260   3261   3362   3363
         3364   3365   3395   3737   3738   3739   3740   3741   3742   3743   3744   3745   3746   3751
STM1     3400#  3458   3509   3564   3612   3665
STM2     3416#  3482   3536   3588   3641   3696
SWRSU    1220#  1444#
TOUT     1439#  3805
TRMTRP   3751#
TYPBIN   1220#
TYPDEC   1220#  3395
TYPNAM   1220#
TYPNUM   1220#
TYPOCS   1157#  1220#
TYPOCT   1220#  3708   3716   3739   3743   3805
TYPTXT   1220#  1448   3482   3536   3588   3641   3696   3706   3710   3805
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ZP24     1868#  1874   1898   1926
ZP25     1954#
ZP26     1961#  1968
ZP27     1990#  1998
ZP28     2022#  2034
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LPA-KW11K DIAGNOSTIC MD-11-CRLPG-C      MACY11 30G(1063)  24-OCT-80  09:38  PAGE 5-2
CRLPGC.P11     18-AUG-80 09:15          CROSS REFERENCE TABLE -- MACRO NAMES                              SEQ 0200

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ZP3EA     2288#    2297
ZP30      2134#    2144
ZP31      2181#    2190
ZP310     2596#    2607
ZP311     2631#    2651
ZP312     2714#    2724
ZP33      2329#    2339
ZP34      2370#    2379
ZP35      2406#    2418
ZP36      2455#    2467
ZP37      2548#    2549#
ZP38      2551#
ZP39      2593#    2594#
ZP42      2760#    2776
ZP43      2813#    2827
ZP44      2882#    2893
ZP45      2935#    2943
ZP46E     3048#    3049#    3050#    3051#    3052#    3053#
ZP47      3055#    3064
ZP6E      3117#    3136
ZP61E     3258#    3259#    3260#    3261#    3362     3363     3364     3365
ZZ1       1672#    1778     1789     1812     1840     1874     1898     1926
Z1        1518#
Z2        1519#    1542
Z3        1560#    1571
Z4        1587#    1604
Z6        1622#    1630
Z7        1648#    1655
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$DMD1     1048#
$MMAST     772#
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$$CMTM    1279#
$$ESCA    1220#
$$NEWT    1220#    1518     1542     1571     1604     1630     1655     1778     1789     1812     1840     1874     1898     1926     1968
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          2467     2548     2549     2593     2594     2607     2651     2724     2776     2827     2893     2943     2968     3048     3049
          3050     3051     3052     3053     3064     3136     3258     3259     3260     3261     3362     3363     3364     3365
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$$SETM    1444#
$$SKIP    1220#
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.HEADE    1156#    1207
.KMADR      55#    1439
.KSIS      184#    1454
.LOADL     459#    3805
.LPAIN     209#    3805
.PUTCS     418#    3805
.RESET     329#    3805
.SETTR    1156#
.SETUP    1156#    1442
.SWRHI    1157#    1208
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.$APTH   1159#    1277
.$APTY   1159#    3745
.$CATC   1157#    1209
.$CMTA   1157#    1279
.$EOP    1158#    3395
.$ERRO   1158#    3738
.$ERRT   1158#    3739
.$INLP    652#    3805
.$MMAC    141#
.$OUTL    610#    3805
.$POWE   1157#    3746
.$RDOC   1156#    1159#    3742
.$READ   1158#    3743
.$SCOP   1158#    3741
.$TLKW    511#    3805
.$TOUT   1439#    3805
.$TRAP   1156#    3751
.$TYPD   1156#    1158#    3740
.$TYPE   1158#    3744
.$TYPO   1157#    3737

. ABS.  043000       000       CON    RW     ABS    LCL    I
        000000       001       CON    RW     REL    LCL    I

 ERRORS DETECTED:  0
 DEFAULT GLOBALS GENERATED:  0

 CRLPGC,CRLPGC/CRF=CRLPAB.MAC,CRLPGC.P11
 RUN-TIME: 42 36 1 SECONDS
 RUN-TIME RATIO: 390/80=4.8
 CORE USED:  42K  (83 PAGES)
```

```
                                 ;THIS FILE IS THE SAME AS "CRLPX0.P11" EXCEPT IT IS LOADED INTO 65000
                                 ;IT IS ALSO THE SAME AS "DRLPX2.P11" EXCEPT NAME CHANGE "CRLPX2.P11"


                                           .LIST   MC,BIN,BEX,MEB
                                           .NLIST  MD,CND,ME

            177777                         ADDRESS=-1
                                 ;         MACRO DEFFINITIONS FOR M8200 AND M8204 MICRO-PROCESSOR
                                 ;         INSTRUCTION SET.
                                 ;         TO BE USED WITH RSX MACRO-11 ASSEMBLER
                                 ;
                                 ;         26-MAY-1976
     000000'                               $BEGIN
     000000                                $LOC    42000
                                           .GLOBL  DRLPX2
                                           .ENABL  GBL

                                           ;*
                                           ;*MICRO CODE FOR KMC-11
```

```
                                    ;*THIS CODE WILL BE DOWN LOADED INTO BOTH
                                    ;*KMC-11'S. THE CODE RUNS ASYNCRONOUS TO THE PDP-11 CODE
                                    ;*WE SYNC THROUGH COMMANDS PASSED VIA THE OUT*/IBUS* REGS.
                                    ;*


    042000                  DRLPX2: ;JUMP TABLE USED FOR COMMANDS
    042000                          BR      STARTU          ;GOTO START
(2) 042000  100407                  .WORD   .$$$.
    042002                          BR      CMNOP           ;NOP=1
(2) 042002  100420                  .WORD   .$$$.
    042004                          BR      RDSILO          ;=2 READ SILO PUT IN BSEL4
(2) 042004  100430                  .WORD   .$$$.
    042006                          BR      WRSILO          ;=3 READ BSEL4 PUT IN SILO.
(2) 042006  100432                  .WORD   .$$$.
    042010                          BR      RDCMND          ;=4 READ FAST PATH PUT IN BSEL4
(2) 042010  100434                  .WORD   .$$$.
    042012                          BR      WRCMND          ;=5 READ BSEL4, PUT IN FAST PATH.
(2) 042012  100436                  .WORD   .$$$.
    042014                          BR      SAMP            ;=6 TAKE AN A/D SAMPLE
(2) 042014  100440                  .WORD   .$$$.

                                    ;START OF U CODED


    042016                  STARTU:
    042016                          MOVE    # 0,BREG
(3) 042016  000400                  .WORD   .$$$.
    042020                          MOVE    BREG,OUT1 <0>   ;CLEAR UNIBUS CSRS
(3) 042020  061220                  .WORD   .$$$.
    042022                          MOVE    BREG,OUT1 <2>
(3) 042022  061222                  .WORD   .$$$.
    042024                          MOVE    BREG,OUT1 <3>
(3) 042024  061223                  .WORD   .$$$.
    042026                          MOVE    BREG,OUT1 <4>
(3) 042026  061224                  .WORD   .$$$.
    042030                          MOVE    BREG,OUT1 <5>
(3) 042030  061225                  .WORD   .$$$.
    042032                          MOVE    BREG,OUT1 <6>
(3) 042032  061226                  .WORD   .$$$.
    042034                          MOVE    BREG,OUT1 <7>
(3) 042034  061227                  .WORD   .$$$.
    042036                          MOVE    BREG,SPAD <6>
(3) 042036  063226                  .WORD   .$$$.

    042040                  CMNOP:  MOVE    INP0 <12>,OUT1 <0> ;READ STATUS
(3) 042040  021240                  .WORD   .$$$.
    042042                          MOVE    # 377,BREG
(3) 042042  000777                  .WORD   .$$$.
    042044                          MOVE    BREG,OUT1 <2>   ;INDICATE READY FOR COMMAND.
(3) 042044  061222                  .WORD   .$$$.

    042046                  LOOP:   MOVE    INP0 <12>,OUT1 <0> ;READ STATUS
(3) 042046  021240                  .WORD   .$$$.

    042050                          MOVE    INP1 <2>,SPAD <0> ;READ COMMAND REG.
```

```
 (3)  042050  123040                   .WORD   .$$$.
      042052                           BZ      LOOP            ;NO COMMAND THEN LOOP
 (2)  042052  101423                   .WORD   .$$$.

      042054                           MOVE    INP1 <2>,SPAD <0> ;RE-READ COMMAND.
 (3)  042054  123040                   .WORD   .$$$.

      042056                           BR      SPAD <0>        ;BR BASED ON CMND.
 (2)  042056  160600                   .WORD   .$$$.
                                                               ;NO-USER PROTECTION OFFERED.
                                                               ;IF YOU ENTER WRONG CODE -
                                                               ;YOU LOSE.

                                       ;
                                       ;ROUTINE TO READ THE SILO, PUT IN
                                       ;*BUS REG 4
                                       ;CMD=2
                                       ;
      042060                   RDSILO: MOVE    INP0 <10>,OUT1 <4> ;READ SILO.
 (3)  042060  021204                   .WORD   .$$$.
                                                               ;WRITE *BUS
      042062                           BR      CMNOP           ;RETURN.
 (2)  042062  100420                   .WORD   .$$$.

                                       ;
                                       ;ROUTINE TO WRITE SILO, READ DATA FROM
                                       ;*BUS REG 4
                                       ;CMD=3
                                       ;

      042064                   WRSILO: MOVE    INP1 <4>,OUT0 <10> ;READ DATA IN *BUS
 (3)  042064  122110                   .WORD   .$$$.
                                                               ;WRITE SILO.
      042066                           BR      CMNOP
 (2)  042066  100420                   .WORD   .$$$.

                                       ;
                                       ;ROUTINE TO READ FAST PATH (CMND) REG.
                                       ;PUT IN *BUS REG 4
                                       ;CMD=4
                                       ;

      042070                   RDCMND: MOVE    INP0 <11>,OUT1 <4> ;READ FAST PATH
 (3)  042070  021224                   .WORD   .$$$.
                                                               ;WRITE *BUS.
      042072                           BR      CMNOP           ;RETURN
 (2)  042072  100420                   .WORD   .$$$.

                                       ;
                                       ;ROUTINE TO WRITE FAST PATH (CMND) REG.
                                       ;TAKE DATA FROM *BUS REG 4.
                                       ;CMD=5
                                       ;

      042074                   WRCMND: MOVE    INP1 <4>,OUT0 <11> ;READ DATA IN *BUS
 (3)  042074  122111                   .WORD   .$$$.
 541                                                            ;WRITE INTO FAST PATH.
 542  042076                          BR      CMNOP             ;RETURN.
 (2)  042076  100420                  .WORD   .$$$.
 543
 544
 545                                  ;
 546                                  ;THIS ROUTINE TAKES AN A/D SAMPLE.
 547                                  ;CALL= CMND 6 IN BSEL2
 548                                  ;THESE REGS. MUST BE SET UP IN ADVANCE.
 549                                  ;BSEL 3 MUST CONTAIN READ CODE FOR A/D BUFFER.
 550                                  ;BSEL 4,5 MUST CONTAIN  A/D CSR SETTING.
 551                                  ;BSEL 6 MUST CONTAIN WRITE CODE FOR A/D CSR
 552                                  ;BSEL 7 MUST CONTAIN READ CODE FOR A/D CSR
 553                                  ; BSEL 3,6,7 WILL REMAIN  UNEFFECTED.
 554                                  ; BSEL 4,5 WILL CONTAIN A/D SAMPLE.
 555                                  ;BSEL2 WILL CONTAIN CODE 377 WHEN DONE.
 556
 566
 567  042100                          WTMC    SAMP
 (4)  042100  020640                  .WORD   .$$$.
 (3)  042102  103040                  .WORD   .$$$.
 568  042104                          MOVE    INP1 <6>,OUTO <11>     ;SEND A/D WRITE CODE.
 (3)  042104  122151                  .WORD   .$$$.
 569  042106                          WTMC    SAMP1
 (4)  042106  020640                  .WORD   .$$$.
 (3)  042110  103043                  .WORD   .$$$.
 570  042112                          MOVE    INP1 <4>,OUTO <11>     ;SEND LOW BYTE CSR INFO.
 (3)  042112  122111                  .WORD   .$$$.
 571  042114                          WTMC    SAMP2
 (4)  042114  020640                  .WORD   .$$$.
 (3)  042116  103046                  .WORD   .$$$.
 572  042120                          MOVE    INP1 <5>,OUTO <11>     ;SEND HIGH BYTE CSR INFO.
 (3)  042120  122131                  .WORD   .$$$.
 573  042122                          WTMC    SLOOP
 (4)  042122  020640                  .WORD   .$$$.
 (3)  042124  103051                  .WORD   .$$$.
 574  042126                          MOVE    INP1 <7>,OUTO <11>     ;SEND READ CODE TO GET A/D CSR.
 (3)  042126  122171                  .WORD   .$$$.
 575  042130                          WTMC    SAMP3
 (4)  042130  020640                  .WORD   .$$$.
 (3)  042132  103054                  .WORD   .$$$.
 576  042134                          WTMM    SLOOP1
 (4)  042134  020640                  .WORD   .$$$.
 (4)  042136  061620                  .WORD   .$$$.
 (3)  042140  103056                  .WORD   .$$$.
 577  042142                          MOVE    INPO <11>,BREG
 (3)  042142  020620                  .WORD   .$$$.
 578  042144                          MOVE    BREG,SPAD <0>
 (3)  042144  063220                  .WORD   .$$$.
 579  042146                          WTMM    SLOOP2
 (4)  042146  020640                  .WORD   .$$$.
 (4)  042150  061620                  .WORD   .$$$.
 (3)  042152  103063                  .WORD   .$$$.
 580  042154                          MOVE    INPO <11>,BREG
 (3)  042154  020620                  .WORD   .$$$.
 581  042156                          BB7     CMNOP                  ;ABORT IF A/D BIT 15=1
```

```
   (2)  042156  103420                      .WORD    .$$$.
   582  042160                              MOVE     SPAD <0>,BREG
   (3)  042160  060600                      .WORD    .$$$.
   583  042162                              BB7      LOPE
   (2)  042162  103473                      .WORD    .$$$.
   584  042164                              BR       SLOOP                     ;IF A/D NOT DONE,EXIT.
   (2)  042164  100451                      .WORD    .$$$.
   585  042166                     LOPE:    MOVE     INP1 <3>,OUT0 <11>        ;ISSUE READ A/B BUFFER.
   (3)  042166  122071                      .WORD    .$$$.
   586  042170                              WTMM     SLOOP3
   (4)  042170  020640                      .WORD    .$$$.
   (4)  042172  061620                      .WORD    .$$$.
   (3)  042174  103074                      .WORD    .$$$.
   587  042176                              MOVE     INP0 <11>,OUT1 <4>
   (3)  042176  021224                      .WORD    .$$$.
   588  042200                              WTMM     SLOOP4
   (4)  042200  020640                      .WORD    .$$$.
   (4)  042202  061620                      .WORD    .$$$.
   (3)  042204  103100                      .WORD    .$$$.
   589  042206                              MOVE     INP0 <11>,OUT1 <5>
   (3)  042206  021225                      .WORD    .$$$.
   590  042210                              BR       CMNOP
   (2)  042210  100420                      .WORD    .$$$.
   591  042212  177777                      .WORD    -1
   592          000001                      .END
```

```
ADDRES= 177777          SAMP     042100         .ADDWC= 000020         .DMEM = 002400         .SELB = 000220
CLK   = 000020          SAMP1    042106         .AND  = 000260         .DNOP = 000000         .SIMM = 000000
CMNOP   042040          SAMP2    042114         .BB0  = 002000         .DOUT0= 002000         .SIN0 = 020000
DRLPX2  042000 G        SAMP3    042130         .BB1  = 002400         .DOUT1= 001000         .SIN1 = 120000
LOOP    042046          SLOOP    042122         .BB4  = 003000         .DSPAD= 003000         .SMEM = 040000
LOPE    042166          SLOOP1   042134         .BB7  = 003400         .DSPBR= 003400         .SUB  = 000340
MARHLD= 000000          SLOOP2   042146         .BC   = 001000         .D0   = 000400         .SUBWC= 000040
MARINC= 014000          SLOOP3   042170         .BR   = 000400         .F0   = 000020         .SUB2C= 000360
MARLD = 010000          SLOOP4   042200         .BSBRG= 160000         .INC  = 000060         .S0   = 020000
MARLDX= 004000          STARTU   042016         .BSIMM= 100000         .LORN = 000240         .XOR  = 000320
PAGE0 = 000000          WRCMND   042074         .BSMEM= 140000         .MINUS= 000360         .$$$. = 100420
PAGE1 = 001000          WRSILO   042064         .BZ   = 001400         .M0   = 004000         ..LOC = 042040
PAGE2 = 002000          $$$SER=  000001         .C0   = 000400         .OR   = 000300         .2A   = 000120
PAGE3 = 003000          .      = 042214         .DBR  = 000400         .PLUS = 000000         .2AWC = 000140
RDCMND  042070          .ADC   = 000100         .DBRSH= 001400         .SBREG= 060000
RDSILO  042060          .ADD   = 000000         .DEC  = 000160         .SELA = 000200

. ABS.  042214    000      OVR   RW    ABS   LCL   D
        000000    001      CON   RW    ABS   LCL   I
ABCODE  004000    002      CON   RW    REL   LCL   I

 ERRORS DETECTED:  0
 DEFAULT GLOBALS GENERATED:  0

 CRLPX2,CRLPX2=CRLPX2
 RUN-TIME: 3 3 0 SECONDS
 RUN-TIME RATIO: 49/7=6.5
 CORE USED:  42K  (83 PAGES)
```