KMC-11

FREE RUNNING TEEST

CZKCGA0

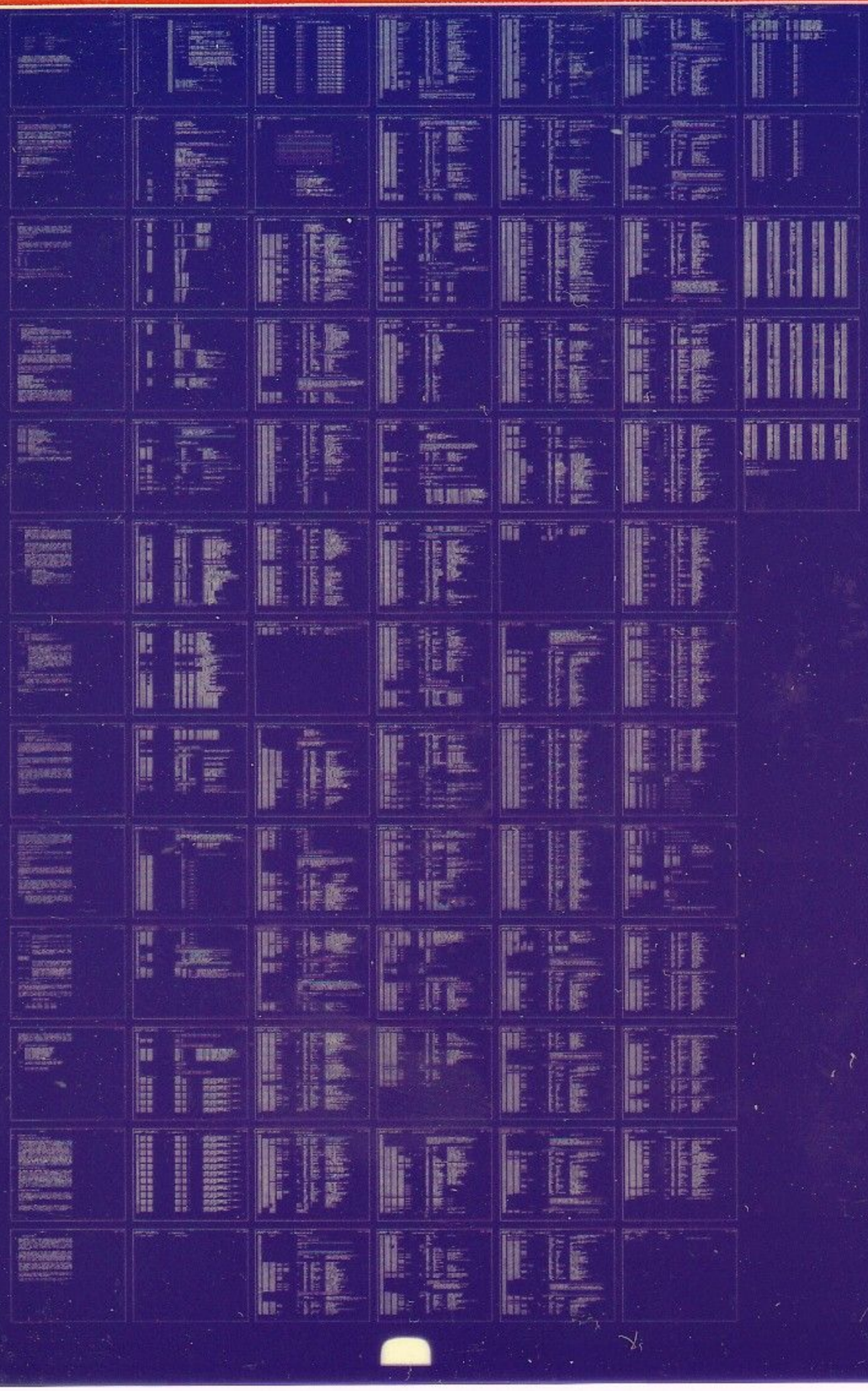
AH-E108A-MC

FICHE 1 OF 1

DEC 1978

digital

MADE IN USA



IDENTIFICATION

PRODUCT CODE:	AC-E107A-MC
PRODUCT NAME:	CZKCgA0 KMC FREE RUNNING TEST
DATE:	MAY 1978
MAINTAINER:	DIAGNOSTICS
AUTHOR:	Ed Badger

1. ABSTRACT

The function of the KMC11 diagnostics is to verify that the option operates according to specifications. The diagnostics verfiy that there are no malfunctions and the all operations of the KMC11 are correct in its environment.

Parameters must be set up to alert the diagnostics to the KMC11 configuration. These parameters are contained in the STATUS TABLE and are generated in two ways: 1) Manual Input - the operator answers questions. 2) Autosizing - the program determines the parameters automatically.

CZDMG tests the KMC11 micro-processor Free running tests are performed. A line unit (M8201 or M8202) must be installed. CZDMG can be used as a heat test diagnostic by manufacturing.

Currently there are five off line diagnostics that are to be run in sequence to insure that if an error should occur it will be detected at an early stage.

NOTE: Additional diagnostics may be added in the future.

The five diagnostics are:

1. DZKCA KMC-11 CPU Micro-Diagnostics
2. DZKCC Basic W/R and Micro-Processor Tests
3. DZKCD KMC-11 Low speed jump and memory tests
4. DZKCE DDCMP mode line unit tests
5. DZKCF Bitstuff mode line unit tests

2. REQUIREMENTS

2.1 EQUIPMENT

Any PDP11 family CPU (except an LSI-11) with minimum 8k memory
ASR 33 (or equilivalent)
KMC11 or
M8201 or M8202 line unit

2.2 STORAGE

Program will use all 8K of memory except where ABL and BOOTSTRAP LOADER reside. Locations 1500 thru 1640; contain the "STATUS TABLE" information which is generated at start of diagnostics by manual input (questions) or automatically (auto-sizing). This area is an overlay area and should not be altered by the operator.

3. LOADING PROCEEDURE

3.1 METHOD

All programs are in absolute format and are loaded using the ABSOLUTE LOADER. NOTE: if the diagnostics are on a media such as DISK ,MAGTAPE,DECTAPE, or CASSETTE; follow instructions for the monitor which has been provided on that specific media.

ABSOLUTE LOADER starting address *500

MEMORY	* SIZE
4k	17
8k	37
12k	57
16k	77
20k	117
24k	137
28k	157

3.1.1 Place address of ABS loader into switch register.
(also place 'HALT' SW up)

3.1.2 Depress 'LOAD ADDRESS' key on console and release.

3.1.3 Depress 'START KEY' on console and release (program should now be loading into CPU)

4. STARTING PROCEEDURE

a. Set switch register to 000200
b. Depress 'LOAD ADDRESS' key and release
c. Set SWR to zero for 'AUTO SIZING' or SWR bit0=1 for manual input (questions) or SWR bit7=1 to use existing parameters set up by a previous start or a previously run DMC11 diagnostic.
d. Depress 'START KEY' and release. The program will type Maindec Name and program name (if this was the first start up of the program) and also the following:

MAP OF DMC11 STATUS

PC	CSR	STAT1	STAT2	STAT3
001500	160010	145310	177777	000000
001510	160020	145320	177777	000000

The program will type 'R' and proceed to run the diagnostic. The above is only an example. This would indicate the status table starting at add. 1500 in the program. In this example the table contains the information and status of two DMC11'S. THE STATUS TABLE MUST BE VERIFIED BY THE USER IF AUTO SIZING IS DONE. For information of status table see section 8.4 for help.

If the diagnostic was started with SW00=1 indicating manual parameter input then the following shows an example of the questions asked and some example answers:

```
HOW MANY KMC11'S TO BE TESTED?1

01
CSR ADDRESS?160010
VECTOR ADDRESS?310
BR PRIORITY LEVEL?  (4,5,6,7)?5
DOES MICRO-PROCESSOR HAVE CRAM?  (Y OR N)N
WHICH LINE UNIT?  IF NONE TYPE 'N', IF  M8201  TYPE  '1', IF
M8202 TYPE '2'?1
IS THE LOOP BACK CONNECTOR ON?Y
SWITCH PAC#1 (DDCMP LINE#)?377
SWITCH PAC#2 (BM873 BOOT ADD)?377
```

Following the questions the status map is printed out as described above, the information in the map reflects the answers to the questions. If the diagnostic was started with SW00=0 and SW07=0 (AUTO-SIZING) then no questions are asked and only the status-map is printed out. If AUTO-SIZING is used the status information must be verified to be correct (match the hardware). if it does not match the hardware the diagnostic must be restarted with SW00=1 and the questions answered.

4.1 CONTROL SWITCH SETTINGS

SW 15 Set: Halt on error
SW 14 Set: Loop on current test
SW 13 Set: Inhibit error print out
SW 12 Set: Inhibit type out/abell on error.
SW 11 Set: Inhibit iterations. (quick pass)
SW 10 Set: Escape to next test on error
SW 09 Set: Loop with current data
SW 08 Set: Catch error and loop on it
SW 07 Set: Use previous status table.
SW 06 Set: Halt in ROMCLK routine before clocking micro-processor
SW 05 Set: Reserved
SW 04 Set: Reserved
SW 03 Set: Reselect KMC11's desired active
SW 02 Set: Lock on selected test
SW 01 Set: Restart program at selected test
SW 00 Set: Build new status table from questions. (If SW07=0 and SW00=0 a new status table is built by auto-sizing)

Switch 06 and 08-15 are dynamic and can be changed as needed while the diagnostic is running. Switches 00-03 and switch 07 are static, and are used only on starting or restarting the diagnostic.

4.1.2 SWITCH REGISTER OPTIONS (at start up)

SW 01 RESTART PROGRAM AT SELECTED TEST. It is strongly suggested that at least one pass has been made before trying to select a test, the reason being is that the program has to clear areas and set up parameters. When this switch is used the diagnostic will ask TEST NO.? Answer by typing the number of the test desired and carrige return to begin execution at the selected test.

SW 02 LOCK ON SELECTED TEST. This switch when used with SW01 will cause the program to constantly loop on the selected test. Hitting any key on the console will let it advance to the next test and loop until a key is hit again. If SW02=0 when SW01 is used. The program will begin at the selected test and continue normal operations.

SW 03 RESELECT KMC11'S DESIRED ACTIVE. Please note that a message is typed out for setting the switch register equal to KMC11's active. this means if the system has four KMC11s; bits 00,01,02,03 will be set in loc 'DMACTV' from the switch register. Using this switch(SW00) alters that location;therefore if four DMC11s are in the system ***DO NOT*** set switchs greater than SW 03 in the up position. this would be a fatal error. do not select more active DMC11s than there is information on in the status table.

METHOD: A: Load address 200
B: Start with SW 00=1
C: Program will type message
D: Set a switch for each KMC desired active. EXAMPLE: If you have 4 DMC's but only want to run the first and the last set SWR bits 0 and 3 = 1. PRESS CONTINUE
E: Number (IF VALID) will be in data lights (excluding 11/05)
F: Set with any other switch settings desired. PRESS CONTINUE.

4.1.3 DYNAMIC SWITCHES

ERROR SWITCHES

1. SW 12 Delete print out/bell on error.
2. SW 13 Delete error printout.
3. SW 15 Halt on the error.
4. SW 08 Goto beginning of the test(on error).
5. SW 10 Goto next test(on error).

SCOPE SWITCHES

1. SW06 Halt in ROMCLK routine before clocking micro-processor instruction. This allows the operator to scope a micro-processor instruction in the static state before it is clocked. Hit continue to resume running.
2. SW09 (if enabled by 'SCOP1') on an error; If an '*' is printed in front of the test no. (ex. *TEST NO. 10) SW09 is incorporated in that test and therefore SW09 is usually the best switch for the scope loop (SW14=0, SW10=0, SW09=1, SW08=0). If SW09 is not enabeled; and there is a HARD error (constant); SW08 is best. (SW14=1,0, SW10=0, SW09=0, SW08=1). for intermittemt errors; SW14=1 will loop on test reguardless of error or not error. (SW14=1, SW10=0, SW09=0, SW08=1,0)
3. SW11 Inhibit interations.
4. SW14 Loop on current test.

4.2 STARTING ADDRESS

Starting address is at 000200 there are no other starting addresses for the KMC11 diagnostics. (See Section 4.0)

NOTE: If address 000042 is non-zero the program assumes it is under ACT11 or XXDP control and will act accordingly after all available KMC11's are tested the program will return to 'XXDP' or 'ACT-11'.

5. OPERATING PROCEDURE

When program is initially started messages as described in section 4.0 will be printed, and program will begin running the diagnostic

5.2 PROGRAM AND/OR OPERATOR ACTION

The typical approach should be

1. Halt on error (via SW 15=1) when ever an error occurs.
2. Clear SW 15.
3. Set SW 14: (loop on this test)
4. Set SW 13: (inhibit error print out)

The TEST NUMBER and PC will be typed out and possibily an error message (this depends on the test) to give the operator an idea as to the source of the problem. If it is necessary to know more information concerning the error report; LOOK IN THE LISTING for that TEST NUMBER which was typed out and then NOTE THE PC of thE ERROR REPORT this way the EXACT FUNCTION of the test CAN BE DETERMINED.

6. ERRORS

As described previously there will always be a TEST NUMBER and PC typed out at the time of an error (providing SW 13=0 and SW 12=0). in most cases additional information will be supplied in the the error message to give the operator an indication of the error.

6.2 ERROR RECOVERY

If for some reason the KMC11 should 'HANG THE BUS' (gain control of bus so that console manual functions are inhibited) an init or power down/up is necessary for operator to regain control of cpu. If this should happen; look in location 'TSTNO' (address 1226)for the number of the test that was running at the time of the catastrophic error. In this way the operator will have an idea as to what the DMC11 was doing at the time of the error.

7. RESTRICTIONS

7.1 STARTING RESTRICTIONS

See section 4. (PLEASE)
Status table should be verified reguardless of how program was started. Also it is important to use this listing along with the information printed on the TTY to completly isolate problems.

7.2 OPERATING RESTRICTIONS

The first time a KMC11 diagnostic is loaded into core and run the STATUS TABLE must be set up. This is done by manual input (SW00=1) or by autosizing (SW00=0 and SW07=0). Thereafter however the status table need not be setup by subsequent restarts or even loading the next DMC diagnostic because the STATUS TABLE is overlayed. The current parameters in the STATUS TABLE are used when SW07=1 on start up.

7.3 HARDWARE CONFIGURATION RESTRICTIONS

KMC(M8204)- Jumper W1 must be in.

LINE UNIT(M8201)- Jumpers W1, W2, and W4 must be IN. Jumpers W3, and W5 must be OUT. SW8 of E26 must be in the ON POSITION.

LINE UNIT (M8202)- Jumper W1 must be in. SW8 of E26 must be in the OFF position.

8. MISCELLANEOUS

8.1 EXECUTION TIME

All KMC11 device diagnostics will give an 'END PASS' message (providing no errors and sw12=0) within 4 mins. This is assuming SW11=1 (DELETE ITERATIONS) is set to give the fastest possible execution. The actual execution time depends greatly on the PDP11 CPU configuration and the amount of memory in the system.

8.2 PASS COMPLETE

NOTE: EVERY time the program is started; the tests will run as if SW11 (delete iterations) was up (=1). This is to 'VERIFY NO HARD ERRORS' as soon as possible. Therefore the first pass -EACH TIME PROGRAM IS STARTED- will be a 'QUICK PASS' until all DMC11's in system are tested. When the diagnostic has completed a pass the following is an example of the print out to be expected.

```
ENC PASS DZDMG CSR:  175000 VEC:  0300 PASSES:  000001
ERRORS:  000000
```

NOTE: The pass count and error counts are cummulitive for each KMC11 that is running, and are set to zero only when the diagnostic is started. Therefore after an overnight run for example, the total passes and errors for each DMC11 since the diagnostic was started are reflected in PASSES: and ERRORS:.

8.4 KEY LOCATIONS

RETURN (1214) Contains the address where program will return when iteration count is reached or if loop on test is asserted.

NEXT (1216) Contains the address of the next test to be peformed.

TSTNO (1226) Contains the number of the test now being peformed.

RUN (1316) The bit in 'RUN' always points to the KMC11 currently being tested. EXAMPLE: (RUN) 1302/0000000001000000 Means that KMC11 no.06 is the KMC11 now running.

DMCR00-DMCR17
DMST00-DMST17
(1500)-(1640)

These locations contain the information needed to test up to 16 (decimal) KMC11s sequentialy. they contain the CSR,VECTOR and STATUS concerning the configuration of each KMC11.

DMACTV (1306) Each bit set in this location indicates that the associated KMC11 will be tested in turn. EXAMPLE: (DMACTV) 1276/0000000000011111 means that KMC11 no. 00,01,02,03,04 will be tested. EXAMPLE: (DMACTV) 1276/0000000000010001 Means that DMC11 no. 00,04 will be tested.

DMCSR (1404) Contains the CSR of the current KMC11 under test.

8.4A 'STATUS TABLE' (1500-1640)

The table is filled by AUTO SIZING or by the manual parameter input (questions) as described previously. Also if desired by user; the locations may be altered by hand (toggled in) to suit the specific configuration.

The example status map shown below contains information for two DMC11'S. the table can contain up to 16 DMC11'S. Following the map is a description of the bits for each map entry

MAP OF KMC11 STATUS

PC	CSR	STAT1	STAT2	STAT3
001500	160010	145310	177777	000000
001510	160020	016320	000000	000000

Each map entry contains 4 words which contain the status information for 1 KMC11. The PC shows where in core memory the first of the 4 words is. In the example above the first KMC'S status is in locations, 1500, 1502, 1504, and 1506. The second KMC status is located at 1510, 1512, 1514, and 1516. The information contained in each 4 word entry is defined as follows:

CSR: Contains KMC11 CSR address

STAT1: BITS 00-08 IS KMC11 VECTOR ADDRESS
BIT15=1 MICRO-PROCESSOR HAS CRAM
BIT15=0 MICRO-PROCESSOR HAS CROM
BIT14=1 TURNAROUND CONNECTOR IS ON
BIT14=0 NO TURNAROUND CONNECTOR
BIT13=0 LINE UNIT IS AN M8201
BIT13=1 LINE UNIT IS AN M8202
BIT12=1 NO LINE UNIT
BITS 09-11 IS KMC11 BR PRIORITY LEVEL

STAT2: LOW BYTE IS SWITCH PAC#1 (DDCMP LINE NUMBER)
HIGH BYTE IS SWITCH PAC#2 (BM873 BOOT ADD)

STAT3:
BIT1=0 KMC11-AR (LOW SPEED)
BIT1=1 KMC11-AL (HIGH SPEED)

8.5 METHOD OF AUTO SIZING

8.5.1 FINDING THE CONTROL STATUS REGISTER.

The auto-sizing routine finds a KMC11 as follows: It starts at address 160000 and tests all address in increments of 10 up to and including address 167760. If the address does not time out, the following is done, the first CROM address is written to a 125252 then it is read back. If it contains a -1 or 125252 or a 626 or 16520 a DMC11 or KMC11 has been found, if not, the address is updated by 10 and the search continues. A -1 indicates a DMC11 with no CROM, a 125252 indicates a KMC11 with CRAM, a 626 indicates a DMC11-AL and a 16520 indicates a DMC11-AR. Further tests are performed at this point to determine which line unit, if any, is installed, if a loop-back connector is installed and various switch settings on the line unit. THIS IS WHY THE STATUS TABLE MUST BE VERIFIED BY THE USER AND IF ANY OF THE INFORMATION DOES NOT AGREE WITH THE HARDWARE THE DIAGNOSTIC MUST BE RESTARTED AND THE QUESTIONS MUST BE ANSWERED. All DMC11's in the system will be found by the auto-sizer. If it does not find a DMC11 the diagnostic must be restarted and the questions answered.

8.5.2 FINDING THE VECTOR AND BR LEVEL

The vector area (address 300-776) is filled with the instruction IOT and '.+2' (next address). The processor status is started at 7 and the DMC is programmed to interrupt. The PS is lowered by 1 until the DMC interrupts, a delay is made and if no interupt occures at PS level 3 (because of a bad DMC11) the program assumes vector address 300 at BR level 5 and the problem should be fixed in the diagnostic. Once the problem is fixed; the program should be re-setup again to get correct vector. If an interupt occured; the address to which the DMC11 interupted to is picked up and reported as the vector. NOTE: if the vector reported is not the vector set up by you; there is a problem and AUTO SIZING should not be done.

8.6 SOFTWARE SWITCH REGISTER

If the diagnostic is run on an 11/04 or other CPU without a switch register then a software switch register is used to allow user the same switch options as described previously. If the hardware switch register does not exist or if one does and it contains all ones (177777) this software switch register is used.

Control:

To obtain control at any allowable time during execution of the diagnostic the operator types a CTRL G on the console terminal keyboard. As soon as the CTRL G is recognized, by the diagnostic, the following message will be displayed:

SWR=XXXXXX NEW?

Where XXXXXX is the current contents of the software switch register in octal. The software control routine will then await operator action. At which time the operator is required to type one or more of the legal characters: 1) 0 - 7, 2) line feed(<LF>), 3) carriage return(<CR>), or 4) control-U (CTRL U). No check is made for legality. If the input character is not a <LF>, <CR>, or CTRL U it is assumed to be an octal digit.

To change the contents of the SSR the operator simply types the new desired value in octal - leading zeros need not be typed. And terminates the input string with a <CR> or <LF> depending on the program action desired as described below. The input value will be truncated to the last 6 digits typed. At least one digit must be typed on any given input string prior to the terminator before a change to the SSR will occur.

When the input string is terminated with a <CR> the diagnostic will continue execution from the point at which it was interrupted. If a <CR> is the only thing typed the program will continue without changing the SSR. The <LF> differs from the <CR> by restarting the program as if it were restarted at address 200.

If a CTRL U is typed at any point in the input string prior to the terminator the input value will be disregarded and the prompt displayed (SWR = XXXXXX NEW?).

To set the SSR for the starting switches, first load the diagnostic, then hit CTRL G, then start the diagnostic.

```
                01200
                01300
                01400   ;********************** .$SCOPE **********************
                01500   ;
                01600   ;.$SCOPE IS USED TO HANDLE SCOPE LOOPS
                01700   ;
                01800   ;ARGUMENT:
                01900   ;
                02000   ;1)  NUM ----    IF NON-BLANK DESIRED NUMBER OF ITERATIONS
                02100   ;               IF BLANK 2000. ITERATIONS WILL BE MADE
                02200   ;
                02300   ;2)  INSTR --    IF NON-BLANK WILL BE THE FIRST INSTRUCTION OF
                02400   ;               THE SCOPE ROUTINE
                02500   ;               EXAMPLES OF USE:
                02600   ;               1)      <<MOV   R1,SAVR1        ;;SAVE R1>>
                02700   ;               2)      <<MOV   R1,SAVR1>,<MOV  R2,SAVR2>>
                02800   ;               3)      AS A MACRO I.E. <<PUSH  <R0,R1,R2,R3,R4,R5>>>
                02900   ;
                03000   ;3)  NOLOOP -    IF BLANK THE FIRST PASS THROUGH THE PROGRAM WILL
                03100   ;               INHIBIT ITERATIONS.
                03200   ;               IF NON-BLANK ITERATIONS WILL OCCUR ON THE FIRST PASS.
                03300   ;
                03400   ;4)  INSTR2 -    IF NON-BLANK WILL REPLACE THE LAST INSTRUCTION (RTI).
                03500   ;               REFER TO ARGUMENT 2 (INSTR) FOR EXAMPLE OF USE.
                03600   ;               REMEMBER YOU NEED AN RTI (OR RTS) FOR EXITING THE ROUTINE.
                03700   ;
                03800   ;5)     TABLE - IF THIS ARGUMENT IS IDENTICAL TO THE WORD 'SW08TBL''
                03900   ;               AND THE SWITCH 8 (SW08) SCOPE OPTION IS TO BE USED
                04000   ;               A DISPATCH TABLE WILL BE CREATED. IF SW08 IS ON A '1''
                04100   ;               THE LOWER BYTE OF THE SWITCH REGISTER WILL BE USED TO
                04200   ;               INDEX INTO THE DISPATCH TABLE AND SELECT THE STARTING
                04300   ;               ADDRESS OF THE SPECIFIED TEST. THE TABLE IS OF THE FORM:
                04400   ;
                04500   ;                       $SW08TBL:
                04600   ;                               .WORD   TST1+2
                04700   ;                               .WORD   TST2+2
                04800   ;                                  .
                04900   ;                                  .
                05000   ;                                  .
                05100   ;                               .WORD   TSTN+2
                05200   ;
                05300   ;
                05400   ;NOTE:  THIS ROUTINE IS CONDITIONALLY ASSEMBLE BY $SWR
                05500   ;FOR SW14,SW11,SW09,$SW08
                05600   ;SW14=1 LOOP ON TEST
                05700   ;SW11=1 INHIBIT ITERATIONS
                05800   ;SW09=1 LOOP ON ERROR
                05900   ;SW08=1 LOOP ON TEST IN SW<7:0>
                06000   ;
                06100   ;*****************************************************
                06200
```

```
                                .TITLE  AC-E107A-MC
                                ;*COPYRIGHT (C) 1978
                                ;*DIGITAL EQUIPMENT CORP.
                                ;*MAYNARD, MASS. 01754
                                ;*
                                ;*PROGRAM BY DINESH GORADIA
                                ;*
                                ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
                                ;*PACKAGE (MAINDEC-11-DZQAC-C3), JAN 19, 1977.
                                ;*



                                ;*AC-E107A-MC    CZKCGA0 KMC FREE RUNNING TEST
                                ;*COPYRIGHT 1978, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
                                ;*-------------------------------------------------------------

                                ;STARTING PROCEDURE
                                ;LOAD PROGRAM
                                ;LOAD ADDRESS 000200
                                ;SWR=0  AUTOSIZE KMC11
                                ;SW07=1  USE CURRENT KMC11 PARAMETERS
                                ;SW00=1  INPUT NEW KMC11 PARAMETERS
                                ;PRESS START
                                ;PROGRAM WILL TYPE ''AC-E107A-MC    CZKCGA0 KMC FREE RUNNING TEST''
                                ;PROGRAM WILL TYPE STATUS MAP
                                ;PROGRAM WILL TYPE 'R'' TO INDICATE THAT TESTING HAS STARTED
                                ;AT THE END OF A PASS, PROGRAM WILL TYPE PASS COMPLETE MESSAGE
                                ;AND THEN RESUME TESTING
                                ;SUBSEQUENT RESTARTS WILL NOT TYPE PROGRAM TITLE

                                .SBTTL  BASIC DEFINITIONS

                                ;*INITIAL ADDRESS OF THE STACK POINTER *** 1200 ***
001200                          STACK=  1200
                                .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
```

```
  108          000003                  R3=     %3              ;;GENERAL REGISTER
  109          000004                  R4=     %4              ;;GENERAL REGISTER
  110          000005                  R5=     %5              ;;GENERAL REGISTER
  111          000006                  R6=     %6              ;;GENERAL REGISTER
  112          000007                  R7=     %7              ;;GENERAL REGISTER
  113          000006                  SP=     %6              ;;STACK POINTER
  114          000007                  PC=     %7              ;;PROGRAM COUNTER
  115
  116                                  ;*PRIORITY LEVEL DEFINITIONS
  117          000000                  PR0=    0               ;;PRIORITY LEVEL 0
  118          000040                  PR1=    40              ;;PRIORITY LEVEL 1
  119          000100                  PR2=    100             ;;PRIORITY LEVEL 2
  120          000140                  PR3=    140             ;;PRIORITY LEVEL 3
  121          000200                  PR4=    200             ;;PRIORITY LEVEL 4
  122          000240                  PR5=    240             ;;PRIORITY LEVEL 5
  123          000300                  PR6=    300             ;;PRIORITY LEVEL 6
  124          000340                  PR7=    340             ;;PRIORITY LEVEL 7
  125
  126                                  ;*''SWITCH REGISTER'' SWITCH DEFINITIONS
  127          100000                  SW15=   100000
  128          040000                  SW14=   40000
  129          020000                  SW13=   20000
  130          010000                  SW12=   10000
  131          004000                  SW11=   4000
  132          002000                  SW10=   2000
  133          001000                  SW09=   1000
  134          000400                  SW08=   400
  135          000200                  SW07=   200
  136          000100                  SW06=   100
  137          000040                  SW05=   40
  138          000020                  SW04=   20
  139          000010                  SW03=   10
  140          000004                  SW02=   4
  141          000002                  SW01=   2
  142          000001                  SW00=   1
  143                                  .EQUIV  SW09,SW9
  144                                  .EQUIV  SW08,SW8
  145                                  .EQUIV  SW07,SW7
  146                                  .EQUIV  SW06,SW6
  147                                  .EQUIV  SW05,SW5
  148                                  .EQUIV  SW04,SW4
  149                                  .EQUIV  SW03,SW3
  150                                  .EQUIV  SW02,SW2
  151                                  .EQUIV  SW01,SW1
  152                                  .EQUIV  SW00,SW0
  153
  154                                  ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
  155          100000                  BIT15=  100000
  156          040000                  BIT14=  40000
  157          020000                  BIT13=  20000
  158          010000                  BIT12=  10000
  159          004000                  BIT11=  4000
  160          002000                  BIT10=  2000
  161          001000                  BIT09=  1000
  162          000400                  BIT08=  400
  163          000200                  BIT07=  200
```

```
                                BIT06=  100
                                BIT05=  40
                                BIT04=  20
                                BIT03=  10
                                BIT02=  4
                                BIT01=  2
                                BIT00=  1
                                .EQUIV  BIT09,BIT9
                                .EQUIV  BIT08,BIT8
                                .EQUIV  BIT07,BIT7
                                .EQUIV  BIT06,BIT6
                                .EQUIV  BIT05,BIT5
                                .EQUIV  BIT04,BIT4
                                .EQUIV  BIT03,BIT3
                                .EQUIV  BIT02,BIT2
                                .EQUIV  BIT01,BIT1
                                .EQUIV  BIT00,BIT0

                                ;*BASIC ''CPU'' TRAP VECTOR ADDRESSES
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


                                ;INSTRUCTION DEFINITIONS
                                ;-----------------------

005746                          PUSH1SP=5746    ;DECREMENT PROCESSOR STACK 1 WORD
005726                          POP1SP=5726     ;INCREMENT PROCESSOR STACK 1 WORD
010046                          PUSHR0=10046    ;SAVE R0 ON STACK
012600                          POPR0=12600     ;RESTORE R0 FROM STACK
024646                          PUSH2SP=24646   ;DECREMENT STACK TWICE
022626                          POP2SP=22626    ;INCREMENT STACK TWICE
                                .EQUIV  EMT,HLT ;BASIC DEFINITION OF ERROR CALL
```

```
                                ;;*****************************************************************************
                                ;-----------------------------------------------------------------------------
                                        ;TRAPCATCAER FOR ILLEGAL INTERRUPTS
                                        ;THE STANDARD ''TRAP CATCHER'' IS PLACED
                                        ;BETWEEN ADDRESS 0 TO ADDRESS 776.
                                        ;IT LOOKS LIKE 'PC+2 HALT''.
                                ;-----------------------------------------------------------------------------
                                ;;*****************************************************************************

            000000              .=0
000000  000000  000000                .WORD   0,0
                                ;STANDARD INTERRUPT VECTORS
                                ;-------------------------

            000020              .=20
000020  004134                  $SCOPE          ; SCOPE LOOP HANDLER.
000022  000340                  PR7             ; SERVICE AT LEVEL 7.
000024  007122                  $PWRDN                  ;POWER FAIL HANDLER
000026  000340                  PR7                     ;SERVICE AT LEVEL 7
000030  006506                  $ERROR                  ;ERROR HANDLER
000032  000340                  PR7                     ;SERVICE AT LEVEL 7
000034  006410                  $TRAP                   ;GENERAL HANDLER DISPATCH SERVICE
000036  000340                  PR7                     ;SERVICE AT LEVEL 7
                                .SBTTL  ACT11 HOOKS

                                ;;*****************************************************************************
                                ;HOOKS REQUIRED BY ACT11
            000040                      $SVPC=.                 ;SAVE PC
            000046                      .=46
000046  004070                          $ENDAD                  ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .$EOP
            000052                      .=52
000052  000000                          .WORD   0               ;;2)SET LOC.52 TO ZERO
            000040                      .=$SVPC                 ;; RESTORE PC

            000174              .=174
000174  000000              DISPREG:0                           ;SOFTWARE DISPLAY REGISTER
000176  000000              SWREG:  0                           ;SOFTWARE SWITCH REGISTER

            000200              .=200
000200  000137  002402              JMP     .START              ;GO TO START OF PROGRAM


            001000              .=1000
001000  005200  041501  042455  MTITLE: .ASCII  <200><12>/AC-E107A-MC/<200>
(2) 001016  055103  041513  040507       .ASCIZ  /CZKCGA0 KMC FREE RUNNING TEST/<200>
(2)

            177570              DSWR    =       177570
            177570              DDISP   =       177570
```

```
                                .SBTTL  COMMON TAGS

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

                        001200          .=1200
001200                  $CMTAG:                         ;;START OF COMMON TAGS
001200  000000                  .WORD   0
001202  000                     $TSTNM: .BYTE   0       ;;CONTAINS THE TEST NUMBER
001203  000                     $ERFLG: .BYTE   0       ;;CONTAINS ERROR FLAG
001204  000000                  $ICNT:  .WORD   0       ;;CONTAINS SUBTEST ITERATION COUNT
001206  000000                  $LPADR: .WORD   0       ;;CONTAINS SCOPE LOOP ADDRESS
001210  000000                  $LPERR: .WORD   0       ;;CONTAINS SCOPE RETURN FOR ERRORS
001212  000000                  $ERTTL: .WORD   0       ;;CONTAINS TOTAL ERRORS DETECTED
001214  000                     $ITEMB: .BYTE   0       ;;CONTAINS ITEM CONTROL BYTE
001215  001                     $ERMAX: .BYTE   1       ;;CONTAINS MAX. ERRORS PER TEST
001216  000000                  $ERRPC: .WORD   0       ;;CONTAINS PC OF LAST ERROR INSTRUCTION
001220  000000                  $GDADR: .WORD   0       ;;CONTAINS ADDRESS OF 'GOOD' DATA
001222  000000                  $BDADR: .WORD   0       ;;CONTAINS ADDRESS OF 'BAD' DATA
001224  000000                  $GDDAT: .WORD   0       ;;CONTAINS 'GOOD' DATA
001226  000000                  $BDDAT: .WORD   0       ;;CONTAINS 'BAD' DATA
001230  000000                          .WORD   0       ;;RESERVED--NOT TO BE USED
001232  000000                          .WORD   0
001234  000                     $AUTOB: .BYTE   0       ;;AUTOMATIC MODE INDICATOR
001235  000                     $INTAG: .BYTE   0       ;;INTERRUPT MODE INDICATOR
001236  000000                          .WORD   0
001240  177570                  SWR:    .WORD   DSWR    ;;ADDRESS OF SWITCH REGISTER
001242  177570                  DISPLAY: .WORD  DDISP   ;;ADDRESS OF DISPLAY REGISTER
001244  177560                  $TKS:   177560          ;;TTY KBD STATUS
001246  177562                  $TKB:   177562          ;;TTY KBD BUFFER
001250  177564                  $TPS:   177564          ;;TTY PRINTER STATUS REG. ADDRESS
001252  177566                  $TPB:   177566          ;;TTY PRINTER BUFFER REG. ADDRESS
001254  000                     $NULL:  .BYTE   0       ;;CONTAINS NULL CHARACTER FOR FILLS
001255  002                     $FILLS: .BYTE   2       ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
001256  012                     $FILLC: .BYTE   12      ;;INSERT FILL CHARS. AFTER A 'LINE FEED''
001257  000                     $TPFLG: .BYTE   0       ;;''TERMINAL AVAILABLE'' FLAG (BIT<07>=0=YES)
001260  000000                  $REGAD: .WORD   0       ;;CONTAINS THE ADDRESS FROM
                                                        ;;WHICH  ($REG0) WAS OBTAINED
001262  000000                  $REG0:  .WORD   0       ;;CONTAINS (($REGAD)+0)
001264  000000                  $REG1:  .WORD   0       ;;CONTAINS (($REGAD)+2)
001266  000000                  $REG2:  .WORD   0       ;;CONTAINS (($REGAD)+4)
001270  000000                  $REG3:  .WORD   0       ;;CONTAINS (($REGAD)+6)
001272  000000                  $REG4:  .WORD   0       ;;CONTAINS (($REGAD)+10)
001274  000000                  $REG5:  .WORD   0       ;;CONTAINS (($REGAD)+12)
001276  000000                  $TMP0:  .WORD   0       ;;USER DEFINED
001300  000000                  $TMP1:  .WORD   0       ;;USER DEFINED
001302  000000                  $TMP2:  .WORD   0       ;;USER DEFINED
001304  000000                  $TMP3:  .WORD   0       ;;USER DEFINED
001306  000000                  $TMP4:  .WORD   0       ;;USER DEFINED
001310  000000                  $TIMES: 0               ;;MAX. NUMBER OF ITERATIONS
001312  077                     $QUES:  .ASCII  /?/     ;;QUESTION MARK
001313  015                     $CRLF:  .ASCII  <15>    ;;CARRIAGE RETURN
001314  000012                  $LF:    .ASCIZ  <12>    ;;LINE FEED
                                ;;**********************************************************************
                                .SBTTL  APT MAILBOX-ETABLE
```

```
315
316
317
318  001316
319  001316  000000          ;;**********************************************************************
320  001320  000000          .EVEN
321  001322  000000          $MAIL:                          ;;APT MAILBOX
322  001324  000000          $MSGTY: .WORD   AMSGTY          ;;MESSAGE TYPE CODE
323  001326  000000          $FATAL: .WORD   AFATAL          ;;FATAL ERROR NUMBER
324  001330  000000          $TESTN: .WORD   ATESTN          ;;TEST NUMBER
325  001332  000000          $PASS:  .WORD   APASS           ;;PASS COUNT
326  001334  000000          $DEVCT: .WORD   ADEVCT          ;;DEVICE COUNT
327  001336                  $UNIT:  .WORD   AUNIT           ;;I/O UNIT NUMBER
328  001336      002         $MSGAD: .WORD   AMSGAD          ;;MESSAGE ADDRESS
329  001337      000         $MSGLG: .WORD   AMSGLG          ;;MESSAGE LENGTH
330  001340  000000          $ETABLE:                        ;;APT ENVIRONMENT TABLE
331  001342  000000          $ENV:   .BYTE   AENV            ;;ENVIRONMENT BYTE
332  001344  000000          $ENVM:  .BYTE   AENVM           ;;ENVIRONMENT MODE BITS
333                          $SWREG: .WORD   ASWREG          ;;APT SWITCH REGISTER
334                          $USWR:  .WORD   AUSWR           ;;USER SWITCHES
335                          $CPUOP: .WORD   ACPUOP          ;;CPU TYPE,OPTIONS
336                          ;*                              BITS 15-11=CPU TYPE
337                          ;*                                      11/04=01,11/05=02,11/20=03,11/40-04,11/45-05
338                          ;*                                      11/70=06,PDQ=07,Q=10
339  001346      000         ;*                              BIT 10=REAL TIME CLOCK
340  001347      000         $MAMS1: .BYTE   AMAMS1          ;;HIGH ADDRESS,M.S. BYTE
341                          $MTYP1: .BYTE   AMTYP1          ;;MEM. TYPE,BLK#1
342                          ;*                              MEM.TYPE BYTE   --  (HIGH BYTE)
343                          ;*                                      900 NSEC CORE=001
344                          ;*                                      300 NSEC BIPOLAR=002
345  001350  000000          $MADR1: .WORD   AMADR1          ;;HIGH ADDRESS,BLK#1
346                          ;*                                MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF ''TYPE'' ABO
347  001352      000         $MAMS2: .BYTE   AMAMS2          ;;HIGH ADDRESS,M.S. BYTE
348  001353      000         $MTYP2: .BYTE   AMTYP2          ;;MEM.TYPE,BLK#2
349  001354  000000          $MADR2: .WORD   AMADR2          ;;MEM.LAST ADDRESS,BLK#2
350  001356      000         $MAMS3: .BYTE   AMAMS3          ;;HIGH ADDRESS,M.S.BYTE
351  001357      000         $MTYP3: .BYTE   AMTYP3          ;;MEM.TYPE,BLK#3
352  001360  000000          $MADR3: .WORD   AMADR3          ;;MEM.LAST ADDRESS,BLK#3
353  001362      000         $MAMS4: .BYTE   AMAMS4          ;;HIGH ADDRESS,M.S.BYTE
354  001363      000         $MTYP4: .BYTE   AMTYP4          ;;MEM.TYPE,BLK#4
355  001364  000000          $MADR4: .WORD   AMADR4          ;;MEM.LAST ADDRESS,BLK#4
356  001366  000000          $VECT1: .WORD   AVECT1          ;;INTERRUPT VECTOR#1,BUS PRIORITY#1
357  001370  000000          $VECT2: .WORD   AVECT2          ;;INTERRUPT VECTOR#2BUS PRIORITY#2
358  001372  000000          $BASE:  .WORD   ABASE           ;;BASE ADDRESS OF EQUIPMENT UNDER TEST
359  001374  000000          $DEVM:  .WORD   ADEVM           ;;DEVICE MAP
360  001376  000000          $CDW1:  .WORD   ACDW1           ;;CONTROLLER DESCRIPTION WORD#1
361  001400  000000          $CDW2:  .WORD   ACDW2           ;;CONTROLLER DESCRIPTION WORD#2
362  001402  000000          $DDW0:  .WORD   ADDW0           ;;DEVICE DESCRIPTOR WORD#0
363  001404  000000          $DDW1:  .WORD   ADDW1           ;;DEVICE DESCRIPTOR WORD#1
364  001406  000000          $DDW2:  .WORD   ADDW2           ;;DEVICE DESCRIPTOR WORD#2
365  001410  000000          $DDW3:  .WORD   ADDW3           ;;DEVICE DESCRIPTOR WORD#3
366  001412  000000          $DDW4:  .WORD   ADDW4           ;;DEVICE DESCRIPTOR WORD#4
367  001414  000000          $DDW5:  .WORD   ADDW5           ;;DEVICE DESCRIPTOR WORD#5
368  001416  000000          $DDW6:  .WORD   ADDW6           ;;DEVICE DESCRIPTOR WORD#6
369  001420  000000          $DDW7:  .WORD   ADDW7           ;;DEVICE DESCRIPTOR WORD#7
370  001422  000000          $DDW8:  .WORD   ADDW8           ;;DEVICE DESCRIPTOR WORD#8
```

```
  371  001424  000000                $DDW9:  .WORD   ADDW9   ;;DEVICE DESCRIPTOR WORD#9
  372  001426  000000                $DDW10: .WORD   ADDW10  ;;DEVICE DESCRIPTOR WORD#10
  373  001430  000000                $DDW11: .WORD   ADDW11  ;;DEVICE DESCRIPTOR WORD#11
  374  001432  000000                $DDW12: .WORD   ADDW12  ;;DEVICE DESCRIPTOR WORD#12
  375  001434  000000                $DDW13: .WORD   ADDW13  ;;DEVICE DESCRIPTOR WORD#13
  376  001436  000000                $DDW14: .WORD   ADDW14  ;;DEVICE DESCRIPTOR WORD#14
  377  001440  000000                $DDW15: .WORD   ADDW15  ;;DEVICE DESCRIPTOR WORD#15
  378
  379
  380  001442                        $ETEND:
  381
  382                                ;
  383                                ;  PROGRAM CONTROL PARAMETERS
  384                                ;-------------------------------
  385  001442  000000                NEXT:   .WORD   0               ; ADDRSS OF NEXT TEST TO BE EXECUTED
  386  001444  000000                LOCK:   .WORD   0               ; ADDRESS FOR LOCK CURRENT DATA
  387                                ;
  388                                ;   PROGRAM VARIABLES
  389                                ;----------------------
  390  001446  000000                STRTSW: .WORD   0               ; SWITCHES AT START OF PROGRAM
  391  001450  000000                STAT:   .WORD   0               ; KM STATUS WORD STORAGE
  392  001452  000000                CLKX:   .WORD   0               ;
  393  001454  000000                MASKX:  .WORD   0               ;
  394  001456  000000                SAVSP:  .WORD   0               ; STACK POINTER STORAGE
  395  001460  000000                SAVPC:  .WORD   0               ; PROGRAM COUNTER STORAGE
  396  001462  000000                ZERO:   .WORD   0               ;
  397  001464  000001                ONE:    .WORD   1               ;
  398  001466  000000                MEMLIM: .WORD   0               ; HIGHEST LOCATION FOR NPR'S
  399  001470  000001                KMACTV: .BLKW   1               ; KMC11 SELECTED ACTIVE
  400  001472  000001                KMNUM:  .BLKW   1               ; OCTAL NUMBER OF KMC11'S
  401  001474  000001                SAVACT: .BLKW   1               ; ORIGINAL ACTIVE DEVICES.
  402  001476  000001                SAVNUM: .BLKW   1               ; WORKABLE NUMBER.
  403  001500  000000                RUN:    .WORD   0               ; POINTER TO RUNNING DEVICES
  404                                        .EVEN
  405  001502  002072                CREAM:  .WORD   KM.MAP-6        ; TABLE POINTER
  406  001504  002276                MILK:   .WORD   CNT.MAP-4       ; TABLE POINTER
  407                                ;
  408                                ;  PROGRAM CONTROL FLAGS
  409                                ; ---------------------
  410  001506     000                INIFLG: .BYTE   0               ; PROGRAM INITIALIZING FLAG
  411          001510                        .EVEN
  412  001510     000                LOKFLG: .BYTE   0               ; LOCK ON CURRENT TEST FLAG
  413  001511     000                QV.FLG: .BYTE   0               ; QUICK VERIFY FLAG
  414                                                                ; ON FIRST PASS OF EACH KMC11 ITERATIONS WILL BE
  415                                        .EVEN
```

```
                                .SBTTL  ERROR POINTER TABLE

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

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


001512                          $ERRTB:
                                .EVEN
                                ;*      DF              ;; DOES NOT APPLY IN THIS DIAGNOSTIC.
001512  000000                          0
001514  000000                          0
001516  000000                          0
001520  034020                          EM12
001522  034263                          DH5     ;ERROR  1
001524  000000                          0
001526  033654                          EM2
001530  034167                          DH2     ;ERROR  2
001532  034526                          DT13
001534  033677                          EM3
001536  000000                          0       ;ERROR  3
001540  000000                          0
001542  033725                          EM4
001544  000000                          0       ;ERROR  4
001546  000000                          0
001550  033747                          EM5
001552  000000                          0       ;ERROR  5
001554  000000                          0
001556  033725                          EM4
001560  034167                          DH2     ;ERROR  6
001562  034366                          DT5
001564  033747                          EM5
001566  034167                          DH2     ;ERROR  7
001570  034354                          DT4
001572  000000                          0
001574  034135                          DH1     ;ERROR  10
001576  034400                          DT6
001600  000000                          0
001602  034135                          DH1     ;ERROR  11
001604  034416                          DT7
001606  000000                          0
001610  034167                          DH2     ;ERROR  12
001612  034354                          DT4
001614  033774                          EM11
001616  034135                          DH1     ;ERROR  13
001620  034434                          DT10
001622  034020                          EM12
001624  000000                          0       ;ERROR  14
001626  000000                          0
```

```
 472  001630  034020                        EM12
 473  001632  034167                        DH2     ;ERROR  15
 474  001634  034366                        DT5
 475  001636  034044                        EM13
 476  001640  034210                        DH3     ;ERROR  16
 477  001642  034452                        DT11
 478  001644  034067                        EM14
 479  001646  034231                        DH4     ;ERROR  17
 480  001650  034464                        DT12
 481          002034                .=2034
 482                                .SBTTL  APT PARAMETER BLOCK
 483
 484                                ;;*******************************************************************
 485                                ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
 486                                ;;*******************************************************************
 487          002034                        .$X=.   ;;SAVE CURRENT LOCATION
 488          000024                        .=24    ;;SET POWER FAIL TO POINT TO START OF PROGRAM
 489  000024  000200                        200     ;;FOR APT START UP
 490          000044                        .=44    ;;POINT TO APT INDIRECT ADDRESS PNTR.
 491  000044  002034                        $APTHDR ;;POINT TO APT HEADER BLOCK
 492          002034                        .=.$X   ;;RESET LOCATION COUNTER
 493                                ;;*******************************************************************
 494                                ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
 495                                ;INTERFACE SPEC.
 496
 497  002034                        $APTHD:
 498  002034  000000                $HIBTS: .WORD   0       ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
 499  002036  001316                $MBADR: .WORD   $MAIL   ;;ADDRESS OF APT MAILBOX (BITS 0-15)
 500  002040  000132                $TSTM:  .WORD   90.     ;;RUN TIM OF LONGEST TEST
 501  002042  000137                $PASTM: .WORD   95.     ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
 502  002044  000137                $UNITM: .WORD   95.     ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITION
 503  002046  000052                        .WORD   $ETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)
 504
```

```
 505
 506                                    ;KMC11 CONTROL INDICATORS FOR CURRENT KMC11 UNDER TEST
 507                                    ;-----------------------------------------------------
 508
 509  002050  000000                    STAT1:  0
 510  002052  000000                    STAT2:  0
 511  002054  000000                    STAT3:  0
 512
 513                                    ;KMC11 VECTOR AND REGISTER INDIRECT POINTERS
 514                                    ;-------------------------------------------
 515
 516  002056  000000                    KMRVEC: 0               ;POINTER TO KMC11 RECEIVER INTERRUPT VECTOR
 517  002060  000000                    KMRLVL: 0               ;POINTER TO KMC11 RECEIVER INTERRUPT SERVICE PS
 518  002062  000000                    KMTVEC: 0               ;POINTER TO KMC11 TRANSMITTER INTERRUPT VECTOR
 519  002064  000000                    KMTLVL: 0               ;POINTER TO KMC11 TRANSMITTER INTERRUPT SERVICE PS
 520  002066  000000                    KMCSR:  0               ;POINTER TO KMC11 CONTROL STATUS REGISTER
 521  002070  000000                    KMCSRH: 0               ;POINTER TO KMC11 CONTROL STATUS REGISTER HIGH BYTE.
 522  002072  000000                    KMCTL:  0               ;POINTER TO KMC11 CONTOL OUT REGISTER
 523  002074  000000                    KMP04:  0               ;POINTER TO KMC11 PORT REGISTER(SEL 4)
 524  002076  000000                    KMP06:  0               ;POINTER TO KMC11 PORT REGISTER(SEL 6)
 525
 526                                    ;TEMP STORAGE
 527                                    ;------------
 528
 529                                    ;TEMP:  0
 530                                    ;.=.+40
 531
 532                                    ;KMC11 STATUS TABLE AND ADDRESS ASSIGNMENTS
 533                                    ;------------------------------------------
 534
 535          002100                    .=2100
 536  002100                            KM.MAP:
 537  002100  000001                    KMCR00: .BLKW   1               ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 00
 538  002102  000001                    KMS100: .BLKW   1               ;VECTOR FOR KMC11 NUMBER 00
 539  002104  000001                    KMS200: .BLKW   1               ;DDCMP LINE# FOR KMC11 NUMBER 00
 540  002106  000001                    KMS300: .BLKW   1               ;3RD STATUS WORD
 541
 542  002110  000001                    KMCR01: .BLKW   1               ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 01
 543  002112  000001                    KMS101: .BLKW   1               ;VECTOR FOR KMC11 NUMBER 01
 544  002114  000001                    KMS201: .BLKW   1               ;DDCMP LINE# FOR KMC11 NUMBER 01
 545  002116  000001                    KMS301: .BLKW   1               ;3RD STATUS WORD
 546
 547  002120  000001                    KMCR02: .BLKW   1               ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 02
 548  002122  000001                    KMS102: .BLKW   1               ;VECTOR FOR KMC11 NUMBER 02
 549  002124  000001                    KMS202: .BLKW   1               ;DDCMP LINE# FOR KMC11 NUMBER 02
 550  002126  000001                    KMS302: .BLKW   1               ;3RD STATUS WORD
 551
 552  002130  000001                    KMCR03: .BLKW   1               ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 03
 553  002132  000001                    KMS103: .BLKW   1               ;VECTOR FOR KMC11 NUMBER 03
 554  002134  000001                    KMS203: .BLKW   1               ;DDCMP LINE# FOR KMC11 NUMBER 03
 555  002136  000001                    KMS303: .BLKW   1               ;3RD STATUS WORD
 556
 557  002140  000001                    KMCR04: .BLKW   1               ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 04
 558  002142  000001                    KMS104: .BLKW   1               ;VECTOR FOR KMC11 NUMBER 04
 559  002144  000001                    KMS204: .BLKW   1               ;DDCMP LINE# FOR KMC11 NUMBER 04
 560  002146  000001                    KMS304: .BLKW   1               ;3RD STATUS WORD
```

```
561
562  002150  000001                KMCR05: .BLKW   1       ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 05
563  002152  000001                KMS105: .BLKW   1       ;VECTOR FOR KMC11 NUMBER 05
564  002154  000001                KMS205: .BLKW   1       ;DDCMP LINE# FOR KMC11 NUMBER 05
565  002156  000001                KMS305: .BLKW   1       ;3RD STATUS WORD
566
567  002160  000001                KMCR06: .BLKW   1       ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 06
568  002162  000001                KMS106: .BLKW   1       ;VECTOR FOR KMC11 NUMBER 06
569  002164  000001                KMS206: .BLKW   1       ;DDCMP LINE# FOR KMC11 NUMBER 06
570  002166  000001                KMS306: .BLKW   1       ;3RD STATUS WORD
571
572  002170  000001                KMCR07: .BLKW   1       ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 07
573  002172  000001                KMS107: .BLKW   1       ;VECTOR FOR KMC11 NUMBER 07
574  002174  000001                KMS207: .BLKW   1       ;DDCMP LINE# FOR KMC11 NUMBER 07
575  002176  000001                KMS307: .BLKW   1       ;3RD STATUS WORD
576
577  002200  000001                KMCR10: .BLKW   1       ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 10
578  002202  000001                KMS110: .BLKW   1       ;VECTOR FOR KMC11 NUMBER 10
579  002204  000001                KMS210: .BLKW   1       ;DDCMP LINE# FOR KMC11 NUMBER 10
580  002206  000001                KMS310: .BLKW   1       ;3RD STATUS WORD
581
582  002210  000001                KMCR11: .BLKW   1       ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 11
583  002212  000001                KMS111: .BLKW   1       ;VECTOR FOR KMC11 NUMBER 11
584  002214  000001                KMS211: .BLKW   1       ;DDCMP LINE# FOR KMC11 NUMBER 11
585  002216  000001                KMS311: .BLKW   1       ;3RD STATUS WORD
586
587  002220  000001                KMCR12: .BLKW   1       ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 12
588  002222  000001                KMS112: .BLKW   1       ;VECTOR FOR KMC11 NUMBER 12
589  002224  000001                KMS212: .BLKW   1       ;DDCMP LINE# FOR KMC11 NUMBER 12
590  002226  000001                KMS312: .BLKW   1       ;3RD STATUS WORD
591
592  002230  000001                KMCR13: .BLKW   1       ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 13
593  002232  000001                KMS113: .BLKW   1       ;VECTOR FOR KMC11 NUMBER 13
594  002234  000001                KMS213: .BLKW   1       ;DDCMP LINE# FOR KMC11 NUMBER 13
595  002236  000001                KMS313: .BLKW   1       ;3RD STATUS WORD
596
597  002240  000001                KMCR14: .BLKW   1       ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 14
598  002242  000001                KMS114: .BLKW   1       ;VECTOR FOR KMC11 NUMBER 14
599  002244  000001                KMS214: .BLKW   1       ;DDCMP LINE# FOR KMC11 NUMBER 14
600  002246  000001                KMS314: .BLKW   1       ;3RD STATUS WORD
601
602  002250  000001                KMCR15: .BLKW   1       ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 15
603  002252  000001                KMS115: .BLKW   1       ;VECTOR FOR KMC11 NUMBER 15
604  002254  000001                KMS215: .BLKW   1       ;DDCMP LINE# FOR KMC11 NUMBER 15
605  002256  000001                KMS315: .BLKW   1       ;3RD STATUS WORD
606
607  002260  000001                KMCR16: .BLKW   1       ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 16
608  002262  000001                KMS116: .BLKW   1       ;VECTOR FOR KMC11 NUMBER 16
609  002264  000001                KMS216: .BLKW   1       ;DDCMP LINE# FOR KMC11 NUMBER 16
610  002266  000001                KMS316: .BLKW   1       ;3RD STATUS WORD
611
612  002270  000001                KMCR17: .BLKW   1       ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 17
613  002272  000001                KMS117: .BLKW   1       ;VECTOR FOR KMC11 NUMBER 17
614  002274  000001                KMS217: .BLKW   1       ;DDCMP LINE# FOR KMC11 NUMBER 17
615  002276  000001                KMS317: .BLKW   1       ;3RD STATUS WORD
616
```

617 002300 000000 KM.END: 000000

```
                                ;KMC11 PASS COUNT AND ERROR COUNT TABLE
                                ;--------------------------------------

002302                          CNT.MAP:
002302  000000                  PACT00: 0               ;PASS COUNT FOR KMC11 NUMBER 00
002304  000000                  ERCT00: 0               ;ERROR COUNT FOR KMC11 NUMBER 00

002306  000000                  PACT01: 0               ;PASS COUNT FOR KMC11 NUMBER 01
00231C  000000                  ERCT01: 0               ;ERROR COUNT FOR KMC11 NUMBER 01

002312  000000                  PACT02: 0               ;PASS COUNT FOR KMC11 NUMBER 02
002314  000000                  ERCT02: 0               ;ERROR COUNT FOR KMC11 NUMBER 02

002316  000000                  PACT03: 0               ;PASS COUNT FOR KMC11 NUMBER 03
002320  000000                  ERCT03: 0               ;ERROR COUNT FOR KMC11 NUMBER 03

002322  000000                  PACT04: 0               ;PASS COUNT FOR KMC11 NUMBER 04
002324  000000                  ERCT04: 0               ;ERROR COUNT FOR KMC11 NUMBER 04

002326  000000                  PACT05: 0               ;PASS COUNT FOR KMC11 NUMBER 05
002330  000000                  ERCT05: 0               ;ERROR COUNT FOR KMC11 NUMBER 05

002332  000000                  PACT06: 0               ;PASS COUNT FOR KMC11 NUMBER 06
002334  000000                  ERCT06: 0               ;ERROR COUNT FOR KMC11 NUMBER 06

002336  000000                  PACT07: 0               ;PASS COUNT FOR KMC11 NUMBER 07
002340  000000                  ERCT07: 0               ;ERROR COUNT FOR KMC11 NUMBER 07

002342  000000                  PACT10: 0               ;PASS COUNT FOR KMC11 NUMBER 10
002344  000000                  ERCT10: 0               ;ERROR COUNT FOR KMC11 NUMBER 10

002346  000000                  PACT11: 0               ;PASS COUNT FOR KMC11 NUMBER 11
002350  000000                  ERCT11: 0               ;ERROR COUNT FOR KMC11 NUMBER 11

002352  000000                  PACT12: 0               ;PASS COUNT FOR KMC11 NUMBER 12
002354  000000                  ERCT12: 0               ;ERROR COUNT FOR KMC11 NUMBER 12

002356  000000                  PACT13: 0               ;PASS COUNT FOR KMC11 NUMBER 13
002360  000000                  ERCT13: 0               ;ERROR COUNT FOR KMC11 NUMBER 13

002362  000000                  PACT14: 0               ;PASS COUNT FOR KMC11 NUMBER 14
002364  000000                  ERCT14: 0               ;ERROR COUNT FOR KMC11 NUMBER 14

002366  000000                  PACT15: 0               ;PASS COUNT FOR KMC11 NUMBER 15
002370  000000                  ERCT15: 0               ;ERROR COUNT FOR KMC11 NUMBER 15

002372  000000                  PACT16: 0               ;PASS COUNT FOR KMC11 NUMBER 16
002374  000000                  ERCT16: 0               ;ERROR COUNT FOR KMC11 NUMBER 16

002376  000000                  PACT17: 0               ;PASS COUNT FOR KMC11 NUMBER 17
002400  000000                  ERCT17: 0               ;ERROR COUNT FOR KMC11 NUMBER 17
```

```
671
672
673
674
675
676
```

FORMAT OF STATUS TABLE

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00	
C	O	N	T	R	O	L		R	E	G	I	S	T	E	R	CSR
*	*	*	*	*	*	*	*	*	V	E	C	T	O	R	*	STAT1
*	B	M		A	D	D	*	*	L	I	N	E		#	*	STAT2
															*	STAT3

DEFINITION OF FORMAT

CSR: CONTAINS KMC11 CSR ADDRESS

STAT1: BITS 00-08 IS KMC11 VECTOR ADDRESS
BIT14=1 ???? TURNAROUND CONNECTOR IS ON
BIT14=0 NO TURNAROUND CONNECTOR
BIT13=0 LINE UNIT IS AN M8201
BIT13=1 LINE UNIT IS AN M8202
BIT12=1 NO LINE UNIT
BITS 09-11 IS KMC11 BR PRIORITY LEVEL

STAT2: LOW BYTE IS SWITCH PAC#1 (DDCMP LINE NUMBER)
HIGH BYTE IS SWITCH PAC#2 (BM873 BOOT ADD)

STAT3: BIT0=1 DO FREE RUNNING TESTS ON KMC
(MUST BE SET TO A ONE MANUALLY [PROGRAMS G AND H ONLY])

```
725
726                                                     ;PROGRAM INITIALIZATION
727                                                     ;LOCK OUT INTERRUPTS
728                                                     ;SET UP PROCESSOR STACK
729                                                     ;SET UP POWER FAIL VECTOR
730                                                     ;CLEAR PROGRAM CONTROL FLAGS AND COUNTS
731                                                     ;TYPE TITLE MESSAGE
732
733  002402  012737  000340  177776          .START: MOV     #340,PS         ;LOCK OUT INTERRUPTS
734  002410  012706  001200                  MOV     #STACK,SP       ;SET UP STACK
735  002414  012737  007122  000024          MOV     #$PWRDN,@#24    ;SET UP POWER FAIL VECTOR
736  002422  013737  001472  001476          MOV     KMNUM,SAVNUM    ;SAVE NUMBER OF DEVICES IN SYSTEM.
737  002430  005037  011432                  CLR     SWFLG           ;CLEAR SOFT TYPEOUT FLAG
738  002434  105037  001203                  CLRB    $ERFLG          ;CLEAR ERROR FLAG
739  002440  105037  001511                  CLRB    QV.FLG          ;ZERO QUICK VERIFY FLAG
740  002444  012737  002070  001502          MOV     #KM.MAP-10,CREAM;GET MAP POINTER.
741  002452  012737  002276  001504          MOV     #CNT.MAP-4,MILK ;GET PASS COUNT MAP POINTER
742  002460  012737  100000  001500          MOV     #BIT15,RUN      ;POINT POINTER TO FIRST DEVICE.
743  002466  012700  002302                  MOV     #CNT.MAP,R0     ;PASS COUNT POINTER TO R0
744  002472  005020                  23$:    CLR     (R0)+           ;CLEAR TABLE
745  002474  022700  002402                  CMP     #CNT.MAP+100,R0 ;DONE YET?
746  002500  001374                  BNE     23$             ;KEEP GOING
747  002502  005037  001216                  CLR     $ERRPC          ;CLEAR LAST ERROR POINTER
748  002506  012737  000001  001202          MOV     #1,$TSTNM       ;SET UP FOR TEST 1
749  002514  012737  002402  001206          MOV     #.START,$LPADR  ;SET UP FOR POWER FAIL BEFORE
750                                                                  ;TESTING STARTS
751  002522  132737  000001  001336          BITB    #1,$ENV         ; IS IT RUNNING UNDER APT?
752  002530  001404                  BEQ     3$              ; IF NOT CHECK FOR TYPE OF SWITCH REGISTER.
753  002532  013737  001340  000176          MOV     $SWREG,SWREG    ; LOAD SOFTWARE SWITCH REG.
754  002540  000423                  BR      6$+2            ; GO SET UP SOFTWARE SWITCH REG.
755  002542  013746  000006          3$:     MOV     @#6,-(SP)       ;SAVE CURRENT VECTORS
756  002546  013746  000004                  MOV     @#4,-(SP)       ;
757  002552  012737  002606  000004          MOV     #6$,@#4         ;SET UP FOR TIMEOUT
758  002560  012737  177570  001240          MOV     #177570,SWR     ;SET SWR TO HARD SWR ADDRESS
759  002566  012737  177570  001242          MOV     #177570,DISPLAY ;SET DISPLAY TO HARD SWR ADDRESS
760  002574  022777  177777  176436          CMP     #-1,@SWR        ;REFERENCE HARDWARE SWITCH REGISTER
761  002602  001402                  BEQ     6$+2            ;IF = -1 USE SOFT SWR ANYWAY
762  002604  000407                  BR      7$              ;IF IT EXISTS AND NOT = -1 USE HARD SWR
763  002606  022626                  6$:     CMP     (SP)+,(SP)+     ;ADJUST STACK
764  002610  012737  000176  001240          MOV     #SWREG,SWR      ;POINTER TO SOFT SWR
765  002616  012737  000174  001242          MOV     #DISPREG,DISPLAY;POINTER TO SOFT DISPLAY REG
766  002624  012637  000004          7$:     MOV     (SP)+,@#4       ;RESTORE VECTORS
767  002630  012637  000006                  MOV     (SP)+,@#6       ;
768  002634  105737  001506                  TSTB    INIFLG          ;HAS INITIALIZATION BEEN PERFORMED
769  002640  001006                  BNE     20$             ;BR IF YES
770  002642  022737  004070  000042          CMP     #$ENDAD,@#42    ;IF ACT-11 AUTOMATIC MODE, DON'T TYPE ID
771  002650  001402                  BEQ     20$
772  002652  104401  001000                  TYPE    ,MTITLE         ;TYPE TITLE MESSAGE
773  002656  004737  011226          20$:    JSR     PC,CKSWR                ;CHECK FOR SOFT SWR
774  002662  017737  176352  001446          MOV     @SWR,STRTSW     ;STORE STARTING SWITCHES
775  002670  005737  000042                  TST     @#42            ;IS IT RUNNING IN AUTO MODE?
776  002674  001402                  BEQ     .+6             ;BR IF NO
777  002676  005037  001446                  CLR     STRTSW          ;IF YES, CLEAR SWITCHES
778  002702  032737  000001  001446          BIT     #SW00,STRTSW    ;IF SW00=1, QUESTIONS ARE ASKED.
779  002710  001012                  BNE     17$             ;BR IF SW00=1
780  002712  105737  001446                  TSTB    STRTSW          ;BIT7=1??
```

```
781  002716  100007                          BPL     17$             ;BR IF SW07=0
782  002720  005737  001470                  TST     KMACTV          ;ARE ANY DEVICES SELECTED?
783  002724  001027                          BNE     16$             ;BR IF YES
784  002726  104401  010725                  TYPE,   NOACT           ;NO DEVICES SELECTED.
785  002732  000000                          HALT                    ;STOP THE SHOW
786  002734  000776                          BR      .-2             ;DISQUALIFY CONTINUE SWITCH
787  002736  105737  001336          17$:    TSTB    $ENV            ; IS IT UNDER APT DUMP MODE?
788  002742  001405                          BEQ     27$             ; YES, CHECK IF APT SIZED IT?
789  002744  132737  000001  001336          BITB    #1,$ENV         ; IS IT UNDER Q,V OR RUN MODE?
790  002752  001012                          BNE     30$             ; YES, NEEDS ONLY APT SIZING.
791  002754  000406                          BR      33$             ; NO, NEEDS REGULAR AUTO.SIZE.
792  002756  105737  001337          27$:    TSTB    $ENVM           ; IS IT SIZED BY APT?
793  002762  100406                          BMI     30$             ; YES, NEEDS ONLY APT SIZING.
794  002764  042737  000001  001446          BIC     #SW00,STRTSW    ; SIZE ONLY IN AUTO MODE.
795  002772  004737  012124          33$:    JSR     PC,AUTO.SIZE    ; GO TO THE AUTO.SIZE.
796  002776  000402                          BR      16$             ; GO PRINT THE MAP.
797  003000  004737  013540          30$:    JSR     PC,APT.SIZE     ; GO DO THE APT SIZING.
798  003004  105737  001506          16$:    TSTB    INIFLG          ;FIRST TIME?
799  003010  001410                          BEQ     21$             ;BR IF YES
800  003012  105737  001446                  TSTB    STRTSW          ;IF USING SAME PARAMETERS DONT TYPE MAP
801  003016  100431                          BMI     1$
802  003020  032737  000006  001446          BIT     #BIT1!BIT2,STRTSW;IS TEST NO. OR LOCK SELECTED
803  003026  001403                          BEQ     24$             ;IF NO THEN TYPE STATUS
804  003030  000424                          BR      1$              ;IF YES DO NOT TYPE STATUS
805  003032  105137  001506          21$:    COMB    INIFLG          ;SET FLAG
806  003036  104401  010073          24$:    TYPE    ,XHEAD          ;TYPE HEADER
807  003042  012704  002100                  MOV     #KM.MAP,R4      ;SET POINTER
808  003046  010437  001276          5$:     MOV     R4,$TMP0        ;SET ADDRESS
809  003052  012437  001300                  MOV     (R4)+,$TMP1     ;SET CSR
810  003056  001411                          BEQ     1$              ;ALL DONE IF ZERO
811  003060  012437  001302                  MOV     (R4)+,$TMP2     ;SET STAT1
812  003064  012437  001304                  MOV     (R4)+,$TMP3     ;SET STAT2
813  003070  012437  001306                  MOV     (R4)+,$TMP4     ;SET STAT3
814  003074  104416                          CONVRT                  ;TYPE OUT STATUS MAP
815  003076  011074                          XSTATQ                  ;
816  003100  000762                          BR      5$
817  003102  012700  002100          1$:     MOV     #KM.MAP,R0      ;R0 POINTS TO STATUS TABLE
818
819                                          ;;**************************************************************************
820                                          ;;*AUTO SIZE TEST
821                                          ;;*THIS TEST VERIFYS THAT THE KMC11S AND/OR KMC11S ARE AT THE CORRECT FLOATING
822                                          ;;*ADDRESSES FOR YOUR SYSTEM. IF THIS TEST FAILS, IT IS NOT A HARDWARE ERROR.
823                                          ;;*CHECK THE ADDRESSES OF ALL FLOATING DEVICES (DJ,DH,DQ,DU,DUP,LK,DMC,DZ,KMC).
824                                          ;;*IF THERE ARE NO OTHER FLOATING DEVICES BEFORE THE KMC11, THE FIRST
825                                          ;;* KMC11 IS 760110. NO DEVICE SHOULD EVER BE AT
826                                          ;;*ADDRESS 760000.
827                                          ;;**************************************************************************
828
829  003106  013746  000004                  MOV     @#4,-(SP)       ;SAVE LOC 4
830  003112  013746  000006                  MOV     @#6,-(SP)       ;SAVE LOC 6
831  003116  005037  000006                  CLR     @#6             ;CLEAR VEC+2
832  003122  005037  001302                  CLR     $TMP2           ;CLEAR FLAG
833  003126  011037  002066          AUSTRT: MOV     (R0),KMCSR      ;GET NEXT KMC CSR
834  003132  001510                          BEQ     AUDONE          ;BR IF DONE
835  003134  012737  003240  000004  2$:     MOV     #NODEV,@#4      ;SET UP FOR TIMEOUT
836  003142  012703  000010          3$:     MOV     #10,R3          ;R3 IS COUNT OF DEVICES BEFORE KMC
```

```
  837  003146  012702  003342              4$:     MOV     #DEVTAB,R2      ;R2 IS DEVICE TABLE PONTER
  838  003152  012701  160010              FLOAT:  MOV     #160010,R1      ;START WITH ADDRESS 160010
  839  003156  005711                      FLOAT:  TST     (R1)            ;CHECK ADDRESS IN R1
  840  003160  111204                              MOVB    (R2),R4         ;IF NO TIMEOUT, GET NEXT ADDRESS
  841  003162  060401                              ADD     R4,R1           ;IN R1
  842  003164  005201                              INC     R1              ;
  843  003166  040401                              BIC     R4,R1           ;
  844  003170  005703                              TST     R3              ;ANY MORE DEVICES TO CHECK FOR?
  845  003172  001371                              BNE     FLOAT           ;BR IF YES
  846  003174  012737  003244  000004              MOV     #ERR,@#4        ;OK ONLY KMC'S ARE LEFT, SET UP FOR TIMEOUT
  847  003202  005711                      FY:     TST     (R1)            ;CHECK KMC ADDRESS
  848  003204  020137  002066                      CMP     R1,KMCSR        ;DOES IT MATCH
  849  003210  001403                              BEQ     OK              ;BR IF YES
  850  003212  062701  000010                      ADD     #10,R1          ;GET NEXT KMC ADDRESS
  851  003216  000771                              BR      FY              ;DO IT AGAIN
  852  003220  062700  000010              OK:     ADD     #10,R0          ;SKIP TO NEXT KMC CSR
  853  003224  062701  000010                      ADD     #10,R1          ; GET NEXT KMC ADDRESS
  854  003230  011037  002066                      MOV     (R0),KMCSR      ; GET NEXT KMC CSR
  855  003234  001447                              BEQ     AUDONE          ; BRANCH IF ALL DONE.
  856  003236  000761                              BR      FY              ; DO IT AGAIN.
  857  003240  122243                      NODEV:  CMPB    (R2)+,-(R3)     ;ON TIMEOUT, INC R2, DEC R3
  858  003242  000002                              RTI                     ;$LPADR
  859  003244  005737  001302              ERR:    TST     $TMP2           ;CHECK FLAG IF = 0 TYPE HEADER
  860  003250  001014                              BNE     1$              ;SKIP HEADER
  861  003252  104401                              TYPE                    ;TYPEOUT HEADER MESSAGE
  862  003254  010756                              CONERR                  ;CONFIGURATION ERROR!!!!
  863  003256  012737  003244  001460              MOV     #ERR,SAVPC      ;SAVE PC FOR TYPEOUT
  864  003264  104417                              CNVRT                   ;TYPE OUT ERROR PC
  865  003266  003322                              ERRPC                   ;
  866  003270  104401                              TYPE                    ;TYPE REST OF HEADER
  867  003272  011023                              CNERR                   ;
  868  003274  012737  177777  001302              MOV     #-1,$TMP2       ;SET FLAG SO IT ONLY GETS TYPED ONCE
  869  003302  010137  001264              1$:     MOV     R1,$REG1        ;SAVE R1 FOR TYPEOUT
  870  003306  104416                              CONVRT
  871  003310  003330                              CONTAB                  ;TYPE CSR VALUES
  872  003312  104401                      3$:     TYPE
  873  003314  011044                              KMCM
  874  003316  022626                      4$:     CMP     (SP)+,(SP)+     ;ADJUST STACK
  875  003320  000737                              BR      OK              ;BR TO GET OUT
  876  003322  000001                      ERRPC:  1
  877  003324     006      002                     .BYTE   6,2
  878  003326  001460                              SAVPC
  879  003330  000002                      CONTAB: 2
  880  003332     006      004                     .BYTE   6,4
  881  003334  001264                              $REG1
  882  003336     006      002                     .BYTE   6,2
  883  003340  002066                              KMCSR
  884  003342     007                      DEVTAB: .BYTE   7               ;DJ
  885  003343     017                              .BYTE   17              ;DH
  886  003344     007                              .BYTE   7               ;DQ
  887  003345     007                              .BYTE   7               ;DU
  888  003346     007                              .BYTE   7               ;DUP
  889  003347     007                              .BYTE   7               ;LK
  890  003350     007                              .BYTE   7               ;DMC
  891  003351     007                              .BYTE   7               ;DZ
  892  003352     007                              .BYTE   7               ;KMC
```

```
 893          003354
 894  003354
 895  003354  012637  000006                  1$:     MOV     (SP)+,@#6       ;RESTORE LOC 6
 896  003360  012637  000004                          MOV     (SP)+,@#4       ;RESTORE LOC 4
 897  003364  032737  000010  0C1446                  BIT     #SW03,STRTSW    ;SELECT SPECIFIC DEVICES??
 898  003372  001422                                  BEQ     3$              ;BR IF NO.
 899  003374  104401  010013                          TYPE    ,MNEW           ;TYPE THE MESSAGE.
 900  003400  005000                                  CLR     R0              ;ZERO DATA LIGHTS
 901  003402  000000                                  HALT                    ;WAIT FOR USER TO TELL WHAT DEVICES TO RUN
 902  003404  027737  175630  001474                  CMP     @SWR,SAVACT     ;IS THE NUMBER VALID?
 903  003412  101404                                  BLOS    2$              ;BR IF NUMBER IS OK.
 904  003414  104401  007666                          TYPE    ,MERR3          ;TELL USER OF INVALID NUMBER.
 905  003420  000000                                  HALT                    ;STOP EVERY THING.
 906  003422  000776                                  BR      .-2             ;RESTART THE PROGRAM AGAIN.
 907  003424  017737  175610  001470          2$:     MOV     @SWR,KMACTV     ;GET NEW DEVICE PATTERN
 908  003432  013700  001470                          MOV     KMACTV,R0       ;SHOW THE USER WHAT HE SELECTED.
 909  003436  000000                                  HALT                    ;CONTINUE DYNAMIC SWITCHES.
 910  003440  012700  000300                  3$:     MOV     #300,R0         ;PREPARE TO CLEAR THE FLOATING
 911  003444  012701  000302                          MOV     #302,R1         ;VECTOR AREA. 300-776
 912  003450  010120                          4$:     MOV     R1,(R0)+        ;START PUTTING 'PC+2 - HALT''
 913  003452  005021                                  CLR     (R1)+           ;IN VECTOR AREA.
 914  003454  022021                                  CMP     (R0)+,(R1)+     ;POP POINTERS
 915  003456  022700  001000                          CMP     #1000,R0        ;ALL DONE??
 916  003462  001372                                  BNE     4$              ;BR IF NO.
 917
 918                                          ;TEST START AND RESTART
 919                                          ;----------------------
 920
 921  003464  012706  001200          .BEGIN: MOV     #STACK,SP       ;SET UP STACK
 922  003470  013746  000006                  MOV     @#6,-(SP)       ;SAVE LOC 6
 923  003474  013746  000004                  MOV     @#4,-(SP)       ;SAVE LOC 4
 924  003500  005000                          CLR     R0              ;START AT 0
 925  003502  012737  003546  000004          MOV     #2$,@#4         ;SET UP FOR TIME OUT
 926  003510  005037  000006                  CLR     @#6             ;TO AUTOSIZE MEMORY
 927  003514  005720                  6$:     TST     (R0)+           ;CHECK ADDRESS IN R0
 928  003516  022700  157776                  CMP     #157776,R0      ;IS IT AT LEAST 28K
 929  003522  001374                          BNE     6$              ;BR IF NO
 930  003524  162700  007776                  SUB     #7776,R0        ;SAVE 2K FOR MONITORS
 931  003530  010037  001466          7$:     MOV     R0,MEMLIM       ;STORE MEMORY LIMIT
 932  003534  012637  000004                  MOV     (SP)+,@#4       ;RESTORE LOC 4
 933  003540  012637  000006                  MOV     (SP)+,@#6       ;RESTORE LOC 6
 934  003544  000413                          BR      10$             ;CONTINUE
 935  003546  022626                  2$:     CMP     (SP)+,(SP)+     ;ADJUST STACK
 936  003550  162700  000004                  SUB     #4,R0           ;GET LAST GOOD ADDRESS
 937  003554  162700  007776                  SUB     #7776,R0        ;SAVE 2K FOR MONITORS
 938  003560  022700  030000                  CMP     #30000,R0       ;IS IT 8K?
 939  003564  001361                          BNE     7$              ;BR IF NO
 940  003566  012700  037400                  MOV     #37400,R0       ;IF 8K DON'T SAVE 2K
 941  003572  000756                          BR      7$              ;
 942  003574  012737  000340  177776  10$:     MOV     #340,PS         ;LOCK OUT INTERRUPTS
 943  003602  032737  000004  001446          BIT     #BIT2,STRTSW    ;CHECK FOR LOCK ON TEST
 944  003610  001406                          BEQ     1$              ;BR IF NO LOCK DESIRED.
 945  003612  104401  007712                  TYPE    ,MLOCK          ;TYPE LOCK SELECTED.
 946  003616  012737  000240  004146          MOV     #NOP,TTST       ;SET UP TO LOCK
 947  003624  000403                          BR      3$              ;CONTINUE ALONG.
 948  003626  013737  004354  004146  1$:     MOV     BRW,TTST        ;PREPARE NORMAL SCOPE ROUTINE
```

```
 949  003634  012737  011474  001206          3$:     MOV     #CYCLE,$LPADR   ;START AT ''CYCLE'' FIND WHICH DEVICE TO TEST
 950  003642  032737  000002  001446          4$:     BIT     #SW01,STRTSW    ;IS TEST NO. SELECTED?
 951  003650  001002                                  BNE     5$              ;BR IF YES
 952  003652  104401  007636                          TYPE    ,MR             ;TYPE R
 953  003656  000177  175324                  5$:     JMP     @$LPADR         ;START TESTING
```

```
                                                        ;END OF PASS
                                                        ;TYPE NAME OF TEST
                                                        ;UPDATE PASS COUNT
                                                        ;CHECK FOR EXIT TO ACT-11
                                                        ;RESTART TEST

                                                .SBTTL  END OF PASS ROUTINE

                                                ;;**********************************************************************
                                                ;*INCREMENT THE PASS NUMBER ($PASS)
                                                ;*IF THERES A MONITOR GO TO IT
                                                ;*IF THERE ISN'T JUMP TO CYCLE

003662                                          $EOP:
003662  000005                                          RESET
003664  005237  001324                                  INC     $PASS           ; INCREMENT THE PASS COUNT
003670  105037  001203                                  CLRB    $ERFLG          ; CLEAR ERROR FLAG
003674  104401  007614                                  TYPE    ,MEPASS         ; TYPE END PASS.
003700  104401  007741                                  TYPE    ,MCSRX          ; TYPE ''CSR''
003704  104417  004104                                  CNVRT   ,XCSR           ; SHOW IT.
003710  104401  007747                                  TYPE    ,MVECX          ; TYPE VECTOR.
003714  104417  004112                                  CNVRT   ,XVEC           ; SHOW IT.
003720  104401  007755                                  TYPE    ,MPASSX         ; TYPE '' PASSES ''
003724  104417  004120                                  CNVRT   ,XPASS          ; SHOW IT.
003730  104401  007766                                  TYPE    ,MERRX          ; TYPE '' ERRORS ''
003734  104417  004126                                  CNVRT   ,XERR           ; SHOW IT.
003740  013700  001504                                  MOV     MILK,R0         ; SET POINTER TO PASSCNT.
003744  013720  001324                                  MOV     $PASS,(R0)+     ; SAVE THE PASS COUNT.
003750  013720  001212                                  MOV     $ERTTL,(R0)+    ; SAVE ERROR COUNT
003754  013777  002060  176074                         MOV     KMRLVL,@KMRVEC  ; RESTORE THE RECEIVER INTERRUPT VECTOR.
003762  005077  176072                                  CLR     @KMRLVL         ; RESTORE RECEIVER LEVEL
003766  013777  002064  176066                         MOV     KMTLVL,@KMTVEC  ; RESTORE THE TRANSMIT INTERRUPT VECTOR.
003774  005077  176064                                  CLR     @KMTLVL         ; RESTORE TRANSMITTER LEVEL
004000  005337  001476                                  DEC     SAVNUM          ; ALL DEVICE TESTED?
004004  001035                                          BNE     $DOAGN          ; BRANCH IF NO.
004006  112737  000377  001511                         MOVB    #377,QV.FLG     ; SET QUICK VERIFY FLAG.
004014  013737  001472  001476                         MOV     KMNUM,SAVNUM    ; RESTORE DEVICE COUNT.
004022  005037  001216                                  CLR     $ERRPC          ; CLEAR LAST ERROR PC
004026  005037  001310                                  CLR     $TIMES          ;;ZERO THE NUMBER OF ITERATIONS
004032  005237  001324                                  INC     $PASS           ;;INCREMENT THE PASS NUMBER
004036  042737  100000  001324                         BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
004044  005327                                          DEC     (PC)+           ;;LOOP?
004046  000001                                $EOPCT: .WORD   1
004050  003013                                          BGT     $DOAGN          ;;YES
004052  012737                                          MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
004054  000001                                $ENDCT: .WORD   1
004056  004046                                          $EOPCT
004060  013700  000042                        $GET42: MOV     @#42,R0         ;;GET MONITOR ADDRESS
004064  001405                                          BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
004066  000005                                          RESET                   ;;CLEAR THE WORLD
004070  004710                                $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
004072  000240                                          NOP                     ;;SAVE ROOM
004074  000240                                          NOP                     ;;FOR
004076  000240                                          NOP                     ;;ACT11
004100                                          $DOAGN:
004100  000137                                          JMP     @(PC)+          ;;RETURN
```

```
1010  004102  011474                  $RTNAD: .WORD   CYCLE
1011  004104  000001                  XCSR:   1
1012  004106     006      002                 .BYTE   6,2
1013  004110  002066                          KMCSR
1014  004112  000001                  XVEC:   1
1015  004114     004      002                 .BYTE   4,2
1016  004116  002056                          KMRVEC
1017  004120  000001                  XPASS:  1
1018  004122     006      002                 .BYTE   6,2
1019  004124  001324                          $PASS
1020  004126  000001                  XERR:   1
1021  004130     006      002                 .BYTE   6,2
1022  004132  001212                          $ERTTL
1023
1024                                          ;SCOPE LOOP AND INTERATION HANDLER
1025                                          ;-------------------------------
1026
1027                                  .SBTTL  SCOPE HANDLER ROUTINE
1028
1029                                  ;;*********************************************************************
1030                                  ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
1031                                  ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
1032                                  ;*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
1033                                  ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
1034                                  ;*SW14=1         LOOP ON TEST
1035                                  ;*SW11=1         INHIBIT ITERATIONS
1036                                  ;*CALL
1037                                  ;*      SCOPE            ;;SCOPE=IOT
1038
1039  004134                          $SCOPE:
1040  004134  005037  001216                  CLR     $ERRPC                  ; CLEAR LAST ERROR PC
1041  004140  023716  013764                  CMP     TST1+2,(SP)             ; IS THIS TEST #1 ?
1042  004144  001413                          BEQ     $XTSTR                  ; IF SO DON'T LOOP.
1043  004146  000406                  TTST:   BR      1$                      ;
1044  004150  105777  175070                  TSTB    @$TKS                   ; KEYBOARD DONE ?
1045  004154  100065                          BPL     $OVER                   ; IF NO DONT WAIT.
1046  004156  017766  175064  177776         MOV     @$TKB,-2(SP)            ;
1047  004164  032777  040000  175046  1$:     BIT     #BIT14,@SWR     ;;LOOP ON PRESENT TEST?
1048  004172  001056                          BNE     $OVER           ;;YES IF SW14=1
1049                                  ;#####START OF CODE FOR THE XOR TESTER#####
1050  004174  000416                  $XTSTR: BR      6$              ;;IF RUNNING ON THE "XOR" TESTER CHANGE
1051                                                                  ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
1052  004176  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE THE CONTENTS OF THE ERROR VECTOR
1053  004202  012737  004222  000004         MOV     #5$,@#ERRVEC    ;;SET FOR TIMEOUT
1054  004210  005737  177060                  TST     @#177060        ;;TIME OUT ON XOR?
1055  004214  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
1056  004220  000436                          BR      $SVLAD          ;;GO TO THE NEXT TEST
1057  004222  022626                  5$:     CMP     (SP)+,(SP)+     ;;CLEAR THE STACK AFTER A TIME OUT
1058  004224  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
1059  004230  000437                          BR      $OVER           ;;LOOP ON THE PRESENT TEST
1060  004232                          6$:;#####END OF CODE FOR THE XOR TESTER#####
1061  004232  105737  001203          2$:     TSTB    $ERFLG          ;;HAS AN ERROR OCCURRED
1062  004236  001404                          BEQ     3$              ;;BR IF NO
1063  004240  105037  001203          4$:     CLRB    $ERFLG          ;;ZERO THE ERROR FLAG
1064  004244  005037  001310                  CLR     $TIMES          ;;CLEAR THE NUMBER OF ITERATIONS TO MAKE
1065  004250  032777  004000  174762  3$:     BIT     #BIT11,@SWR     ;;INHIBIT ITERATIONS?
```

```
1066  004256  001011                          BNE     1$              ;;BR IF YES
1067  004260  005737  001324                  TST     $PASS           ;;IF FIRST PASS OF PROGRAM
1068  004264  001406                          BEQ     1$              ;;      INHIBIT ITERATIONS
1069  004266  005237  001204                  INC     $ICNT           ;;INCREMENT ITERATION COUNT
1070  004272  023737  001310  001204          CMP     $TIMES,$ICNT    ;;CHECK THE NUMBER OF ITERATIONS MADE
1071  004300  002013                          BGE     $OVER           ;;BR IF MORE ITERATION REQUIRED
1072  004302  012737  000001  001204  1$:     MOV     #1,$ICNT        ;;REINITIALIZE THE ITERATION COUNTER
1073  004310  013737  004356  001310          MOV     $MXCNT,$TIMES   ;;SET NUMBER OF ITERATIONS TO DO
1074  004316                        $SVLAD:   ;INCB    $TSTNM          ;;COUNT TEST NUMBERS
1075  004316  113737  001202  001322          MOVB    $TSTNM,$TESTN   ;;SET TEST NUMBER IN APT MAILBOX
1076  004324  011637  001206                  MOV     (SP),$LPADR     ;;SAVE SCOPE LOOP ADDRESS
1077  004330  013777  001202  174704  $OVER:   MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER
1078  004336  013716  001206                  MOV     $LPADR,(SP)     ;;FUDGE RETURN ADDRESS
1079  004342  005037  001444                  CLR     LOCK                    ; RESET LOCK ON DATA.
1080  004346  013701  002066                  MOV     KMCSR,R1                ; R1 CONTAINS BASE KMC ADDRESS.
1081  004352  000002                          RTI
1082  004354  000406                  BRW:    .WORD   406
1083  004356  000020                  $MXCNT: 20                      ;;MAX. NUMBER OF ITERATIONS
1084
1085                                          ;CHECK FOR FREEZE ON CURRENT DATA
1086                                          ;-------------------------------
1087
1088  004360  004737  011226          .SCOP1: JSR     PC,CKSWR                ;CHECK FOR SOFT SWR
1089  004364  032777  001000  174646          BIT     #SW09,@SWR      ;IS SW09=1(SET)?
1090  004372  001405                          BEQ     1$              ;BR IF NOT SET.
1091  004374  005737  001444                  TST     LOCK
1092  004400  001402                          BEQ     1$
1093  004402  013716  001444                  MOV     LOCK,(SP)       ;GOTO THE ADDRESS IN LOCK.
1094  004406  000002                  1$:     RTI                     ;GO BACK.
1095
1096                                          ;TELETYPE OUTPUT ROUTINE
1097                                          ;-----------------------
1098
1099                                  .SBTTL  TYPE ROUTINE
1100
1101                                  ;;**********************************************************************
1102                                  ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
1103                                  ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
1104                                  ;*NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
1105                                  ;*NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
1106                                  ;*NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
1107                                  ;*
1108                                  ;*CALL:
1109                                  ;*1) USING A TRAP INSTRUCTION
1110                                  ;*      TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
1111                                  ;*OR
1112                                  ;*      TYPE
1113                                  ;*      MESADR
1114                                  ;*
1115
1116  004410  105737  001257          $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
1117  004414  100002                          BPL     1$              ;;BR IF YES
1118  004416  000000                          HALT                    ;;HALT HERE IF NO TERMINAL
1119  004420  000430                          BR      3$              ;;LEAVE
1120  004422  010046                  1$:     MOV     R0,-(SP)        ;;SAVE R0
1121  004424  017600  000002                  MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
```

```
1122  004430  122737  000001  001336                CMPB    #APTENV,$ENV      ;;RUNNING IN APT MODE
1123  004436  001011                                BNE     62$               ;;NO,GO CHECK FOR APT CONSOLE
1124  004440  132737  000100  001337                BITB    #APTSPOOL,$ENVM   ;;SPOOL MESSAGE TO APT
1125  004446  001405                                BEQ     62$               ;;NO,GO CHECK FOR CONSOLE
1126  004450  010037  004460                        MOV     R0,61$            ;;SETUP MESSAGE ADDRESS FOR APT
1127  004454  004737  004700                        JSR     PC,$ATY3          ;;SPOOL MESSAGE TO APT
1128  004460  000000                      61$:      .WORD   0                 ;;MESSAGE ADDRFSS
1129  004462  132737  000040  001337      62$:      BITB    #APTCSUP,$ENVM    ;;APT CONSOLE SUPPRESSED
1130  004470  001003                                BNE     60$               ;;YES,SKIP TYPE OUT
1131  004472  112046                      2$:       MOVB    (R0)+,-(SP)       ;;PUSH CHARACTER TO BE TYPED ONTO STACK
1132  004474  001005                                BNE     4$                ;;BR IF IT ISN'T THE TERMINATOR
1133  004476  005726                                TST     (SP)+             ;;IF TERMINATOR POP IT OFF THE STACK
1134  004500  012600                      60$:      MOV     (SP)+,R0          ;;RESTORE R0
1135  004502  062716  000002              3$:       ADD     #2,(SP)           ;;ADJUST RETURN PC
1136  004506  000002                                RTI                       ;;RETURN
1137  004510  122716  000011              4$:       CMPB    #HT,(SP)          ;;BRANCH IF <HT>
1138  004514  001430                                BEQ     8$
1139  004516  122716  000200                        CMPB    #CRLF,(SP)        ;;BRANCH IF NOT <CRLF>
1140  004522  001006                                BNE     5$
1141  004524  005726                                TST     (SP)+             ;;POP  <CR><LF> EQUIV
1142  004526  104401                                TYPE                      ;;TYPE A CR AND LF
1143  004530  001313                                $CRLF
1144  004532  105037  004666                        CLRB    $CHARCNT          ;;CLEAR CHARACTER COUNT
1145  004536  000755                                BR      2$                ;;GET NEXT CHARACTER
1146  004540  004737  004622              5$:       JSR     PC,$TYPEC         ;;GO TYPE THIS CHARACTER
1147  004544  123726  001256              6$:       CMPB    $FILLC,(SP)+      ;;IS IT TIME FOR FILLER CHARS.?
1148  004550  001350                                BNE     2$                ;;IF NO GO GET NEXT CHAR.
1149  004552  013746  001254                        MOV     $NULL,-(SP)       ;;GET # OF FILLER CHARS. NEEDED
1150                                                                          ;;AND THE NULL CHAR.
1151  004556  105366  000001              7$:       DECB    1(SP)             ;;DOES A NULL NEED TO BE TYPED?
1152  004562  002770                                BLT     6$                ;;BR IF NO--GO POP THE NULL OFF OF STACK
1153  004564  004737  004622                        JSR     PC,$TYPEC         ;;GO TYPE A NULL
1154  004570  105337  004666                        DECB    $CHARCNT          ;;DO NOT COUNT AS A COUNT
1155  004574  000770                                BR      7$                ;;LOOP
1156
1157                                      ;HORIZONTAL TAB PROCESSOR
1158
1159  004576  112716  000040              8$:       MOVB    #' ,(SP)          ;;REPLACE TAB WITH SPACE
1160  004602  004737  004622              9$:       JSR     PC,$TYPEC         ;;TYPE A SPACE
1161  004606  132737  000007  004666                BITB    #7,$CHARCNT       ;;BRANCH IF NOT AT
1162  004614  001372                                BNE     9$                ;;TAB STOP
1163  004616  005726                                TST     (SP)+             ;;POP SPACE OFF STACK
1164  004620  000724                                BR      2$                ;;GET NEXT CHARACTER
1165  004622  105777  174422              $TYPEC    TSTB    @$TPS             ;;WAIT UNTIL PRINTER IS READY
1166  004626  100375                                BPL     $TYPEC
1167  004630  116677  000002  174414                MOVB    2(SP),@$TPB       ;;LOAD CHAR TO BE TYPED INTO DATA REG.
1168  004636  122766  000015  000002                CMPB    #CR,2(SP)         ;;IS CHARACTER A CARRIAGE RETURN?
1169  004644  001003                                BNE     1$                ;;BRANCH IF NO
1170  004646  105037  004666                        CLRB    $CHARCNT          ;;YES--CLEAR CHARACTER COUNT
1171  004652  000406                                BR      $TYPEX            ;;EXIT
1172  004654  122766  000012  000002              1$:       CMPB    #LF,2(SP)         ;;IS CHARACTER A LINE FEED?
1173  004662  001402                                BEQ     $TYPEX            ;;BRANCH IF YES
1174  004664  105227                                INCB    (PC)+             ;;COUNT THE CHARACTER
1175  004666  000000                      $CHARCNT: .WORD   0                 ;;CHARACTER COUNT STORAGE
1176  004670  000207                      $TYPEX:   RTS     PC
1177
```

```
1178                                            .SBTTL  APT COMMUNICATIONS ROUTINE
1179
1180                                            ;;*****************************************************************************
1181  004672  112737  000001  005136  $ATY1:   MOVB    #1,$FFLG        ;;TO REPORT FATAL ERROR
1182  004700  112737  000001  005134  $ATY3:   MOVB    #1,$MFLG        ;;TO TYPE A MESSAGE
1183  004706  000403                          BR      $ATYC
1184  004710  112737  000001  005136  $ATY4:   MOVB    #1,$FFLG        ;;TO ONLY REPORT FATAL ERROR
1185  004716                          $ATYC:
1186  004716  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
1187  004720  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
1188  004722  105737  005134                  TSTB    $MFLG           ;;SHOULD TYPE A MESSAGE?
1189  004726  001450                          BEQ     5$              ;;IF NOT:  BR
1190  004730  122737  000001  001336          CMPB    #APTENV,$ENV    ;;OPERATING UNDER APT?
1191  004736  001031                          BNE     3$              ;;IF NOT:  BR
1192  004740  132737  000100  001337          BITB    #APTSPOOL,$ENVM ;;SHOULD SPOOL MESSAGES?
1193  004746  001425                          BEQ     3$              ;;IF NOT:  BR
1194  004750  017600  000004                  MOV     @4(SP),R0       ;;GET MESSAGE ADDR.
1195  004754  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
1196  004762  005737  001316          1$:     TST     $MSGTYPE        ;;SEE IF DONE W/ LAST XMISSION?
1197  004766  001375                          BNE     1$              ;;IF NOT:  WAIT
1198  004770  010037  001332                  MOV     R0,$MSGAD       ;;PUT ADDR IN MAILBOX
1199  004774  105720                  2$:     TSTB    (R0)+           ;;FIND END OF MESSAGE
1200  004776  001376                          BNE     2$
1201  005000  163700  001332                  SUB     $MSGAD,R0       ;;SUB START OF MESSAGE
1202  005004  006200                          ASR     R0              ;;GET MESSAGE LNGTH IN WORDS
1203  005006  010037  001334                  MOV     R0,$MSGLGT      ;;PUT LENGTH IN MAILBOX
1204  005012  012737  000004  001316          MOV     #4,$MSGTYPE     ;;TELL APT TO TAKE MSG.
1205  005020  000413                          BR      5$
1206  005022  017637  000004  005046  3$:     MOV     @4(SP),4$       ;;PUT MSG ADDR IN JSR LINKAGE
1207  005030  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDRESS
1208  005036  013746  177776                  MOV     177776,-(SP)    ;;PUSH 177776 ON STACK
1209  005042  004737  004410                  JSR     PC,$TYPE        ;;CALL TYPE MACRO
1210  005046  000000          4$:     .WORD   0
1211  005050                          5$:
1212  005050  105737  005136          10$:    TSTB    $FFLG           ;;SHOULD REPORT FATAL ERROR?
1213  005054  001416                          BEQ     12$             ;;IF NOT:  BR
1214  005056  005737  001336                  TST     $ENV            ;;RUNNING UNDER APT?
1215  005062  001413                          BEQ     12$             ;;IF NOT:  BR
1216  005064  005737  001316          11$:    TST     $MSGTYPE        ;;FINISHED LAST MESSAGE?
1217  005070  001375                          BNE     11$             ;;IF NOT:  WAIT
1218  005072  017637  000004  001320          MOV     @4(SP),$FATAL   ;;GET ERROR #
1219  005100  062766  000002  000004          ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
1220  005106  005237  001316                  INC     $MSGTYPE        ;;TELL APT TO TAKE ERROR
1221  005112  105037  005136          12$:    CLRB    $FFLG           ;;CLEAR FATAL FLAG
1222  005116  105037  005135                  CLRB    $LFLG           ;;CLEAR LOG FLAG
1223  005122  105037  005134                  CLRB    $MFLG           ;;CLEAR MESSAGE FLAG
1224  005126  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
1225  005130  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
1226  005132  000207                          RTS     PC              ;;RETURN
1227  005134     000          $MFLG:  .BYTE   0               ;;MESSG. FLAG
1228  005135     000          $LFLG:  .BYTE   0               ;;LOG FLAG
1229  005136     000          $FFLG:  .BYTE   0               ;;FATAL FLAG
1230             005140                  .EVEN
1231             000200          APTSIZE=200
1232             000001          APTENV=001
1233             000100          APTSPOOL=100
```

```
1234            000040                          APTCSUP=040
1235                                                    ;-------------------------
1236
1237                                            .SBTTL  TTY INPUT ROUTINE
1238
1239                                            ;;**********************************************************************
1240                                            .ENABL  LSB
1241
1242                                            .DSABL  LSB
1243
1244
1245                                            ;;**********************************************************************
1246                                            ;*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
1247                                            ;*CALL:
1248                                            ;*      RDCHR                           ;;INPUT A SINGLE CHARACTER FROM THE TTY
1249                                            ;*      RETURN HERE                     ;;CHARACTER IS ON THE STACK
1250                                            ;*                                      ;;WITH PARITY BIT STRIPPED OFF
1251                                            ;
1252
1253  005140  011646                            $RDCHR: MOV     (SP),-(SP)              ;;PUSH DOWN THE PC
1254  005142  016666  000004  000002                    MOV     4(SP),2(SP)             ;;SAVE THE PS
1255  005150  105777  174070                    1$:     TSTB    @$TKS                   ;;WAIT FOR
1256  005154  100375                                    BPL     1$                      ;;A CHARACTER
1257  005156  117766  174064  000004                    MOVB    @$TKB,4(SP)             ;;READ THE TTY
1258  005164  042766  177600  000004                    BIC     #^C<177>,4(SP)          ;;GET RID OF JUNK IF ANY
1259  005172  026627  000004  000023                    CMP     4(SP),#23               ;;IS IT A CONTROL-S?
1260  005200  001013                                    BNE     3$                      ;;BRANCH IF NO
1261  005202  105777  174036                    2$:     TSTB    @$TKS                   ;;WAIT FOR A CHARACTER
1262  005206  100375                                    BPL     2$                      ;;LOOP UNTIL ITS THERE
1263  005210  117746  174032                            MOVB    @$TKB,-(SP)             ;;GET CHARACTER
1264  005214  042716  177600                            BIC     #^C177,(SP)             ;;MAKE IT 7-BIT ASCII
1265  005220  022627  000021                            CMP     (SP)+,#21               ;;IS IT A CONTROL-Q?
1266  005224  001366                                    BNE     2$                      ;;IF NOT DISCARD IT
1267  005226  000750                                    BR      1$                      ;;YES, RESUME
1268  005230  026627  000004  000140            3$:     CMP     4(SP),#140              ;;IS IT UPPER CASE?
1269  005236  002407                                    BLT     4$                      ;;BRANCH IF YES
1270  005240  026627  000004  000175                    CMP     4(SP),#175              ;;IS IT A SPECIAL CHAR?
1271  005246  003003                                    BGT     4$                      ;;BRANCH IF YES
1272  005250  042766  000040  000004                    BIC     #40,4(SP)               ;;MAKE IT UPPER CASE
1273  005256  000002                            4$:     RTI                             ;;GO BACK TO USER
1274                                            ;;**********************************************************************
1275                                            ;*THIS ROUTINE WILL INPUT A STRING FROM THE TTY
1276                                            ;*CALL:
1277                                            ;*      RDLIN                           ;;INPUT A STRING FROM THE TTY
1278                                            ;*      RETURN HERE                     ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STAC
1279                                            ;*                                      ;;TERMINATOR WILL BE A BYTE OF ALL 0'S
1280
1281  005260  010346                            $RDLIN: MOV     R3,-(SP)                ;;SAVE R3
1282  005262  005046                                    CLR     -(SP)                   ;;CLEAR THE RUBOUT KEY
1283  005264  012703  005514                    1$:     MOV     #$TTYIN,R3              ;;GET ADDRESS
1284  005270  022703  005523                    2$:     CMP     #$TTYIN+7,R3            ;;BUFFER FULL?
1285  005274  101456                                    BLOS    4$                      ;;BR IF YES
1286  005276  104402                                    RDCHR                           ;;GO READ ONE CHARACTER FROM THE TTY
1287  005300  112613                                    MOVB    (SP)+,(R3)              ;;GET CHARACTER
1288  005302  122713  000177                    10$:    CMPB    #177,(R3)               ;;IS IT A RUBOUT
1289  005306  001022                                    BNE     5$                      ;;BR IF NO
```

```
1290  005310  005716                          TST     (SP)            ;;IS THIS THE FIRST RUBOUT?
1291  005312  001007                          BNE     6$              ;;BR IF NO
1292  005314  112737  000134  005512          MOVB    #'\,9$          ;;TYPE A BACK SLASH
1293  005322  104401  005512                  TYPE    ,9$
1294  005326  012716  177777                  MOV     #-1,(SP)        ;;SET THE RUBOUT KEY
1295  005332  005303                  6$:     DEC     R3              ;;BACKUP BY ONE
1296  005334  020327  005514                  CMP     R3,#$TTYIN      ;;STACK EMPTY?
1297  005340  103434                          BLO     4$              ;;BR IF YES
1298  005342  111337  005512                  MOVB    (R3),9$         ;;SETUP TO TYPEOUT THE DELETED CHAR.
1299  005346  104401  005512                  TYPE    ,9$             ;;GO TYPE
1300  005352  000746                          BR      2$              ;;GO READ ANOTHER CHAR.
1301  005354  005716                  5$:     TST     (SP)            ;;RUBOUT KEY SET?
1302  005356  001406                          BEQ     7$              ;;BR IF NO
1303  005360  112737  000134  005512          MOVB    #'\,9$          ;;TYPE A BACK SLASH
1304  005366  104401  005512                  TYPE    ,9$
1305  005372  005016                          CLR     (SP)            ;;CLEAR THE RUBOUT KEY
1306  005374  122713  000025          7$:     CMPB    #25,(R3)        ;;IS CHARACTER A CTRL U?
1307  005400  001003                          BNE     8$              ;;BR IF NO
1308  005402  104401  005523                  TYPE    ,$CNTLU         ;;TYPE A CONTROL 'U'
1309  005406  000726                          BR      1$              ;;GO START OVER
1310  005410  122713  000022          8$:     CMPB    #22,(R3)        ;;IS CHARACTER A '^R'?
1311  005414  001011                          BNE     3$              ;;BRANCH IF NO
1312  005416  105013                          CLRB    (R3)            ;;CLEAR THE CHARACTER
1313  005420  104401  001313                  TYPE    ,$CRLF          ;;TYPE A 'CR' & 'LF'
1314  005424  104401  005514                  TYPE    ,$TTYIN         ;;TYPE THE INPUT STRING
1315  005430  000717                          BR      2$              ;;GO PICKUP ANOTHER CHACTER
1316  005432  104401  001312          4$:     TYPE    ,$QUES          ;;TYPE A '?'
1317  005436  000712                          BR      1$              ;;CLEAR THE BUFFER AND LOOP
1318  005440  111337  005512          3$:     MOVB    (R3),9$         ;;ECHO THE CHARACTER
1319  005444  104401  005512                  TYPE    ,9$
1320  005450  122723  000015                  CMPB    #15,(R3)+       ;;CHECK FOR RETURN
1321  005454  001305                          BNE     2$              ;;LOOP IF NOT RETURN
1322  005456  105063  177777                  CLRB    -1(R3)          ;;CLEAR RETURN (THE 15)
1323  005462  104401  001314                  TYPE    ,$LF            ;;TYPE A LINE FEED
1324  005466  005726                          TST     (SP)+           ;;CLEAN RUBOUT KEY FROM THE STACK
1325  005470  012603                          MOV     (SP)+,R3        ;;RESTORE R3
1326  005472  011646                          MOV     (SP),-(SP)      ;;ADJUST THE STACK AND PUT ADDRESS OF THE
1327  005474  016666  000004  000002          MOV     4(SP),2(SP)     ;;      FIRST ASCII CHARACTER ON IT
1328  005502  012766  005514  000004          MOV     #$TTYIN,4(SP)
1329  005510  000002                          RTI                     ;;RETURN
1330  005512     000                  9$:     .BYTE   0               ;;STORAGE FOR ASCII CHAR. TO TYPE
1331  005513     000                          .BYTE   0               ;;TERMINATOR
1332  005514  000007          $TTYIN: .BLKB   7               ;;RESERVE 7 BYTES FOR TTY INPUT
1333  005523     136  006525  000012  $CNTLU: .ASCIZ  /^U/<15><12>    ;;CONTROL 'U'
1334  005530  043536  005015     000  $CNTLG: .ASCIZ  /^G/<15><12>    ;;CONTROL 'G'
1335  005535     015  051412  051127  $MSWR:  .ASCIZ  <15><12>/SWR = /
1336  005542  036440  000040
1337  005546  020040  042516  020127  $MNEW:  .ASCIZ  /  NEW = /
1338  005554  020075     000
1339          005560                  .EVEN
1340                                  .SBTTL  READ AN OCTAL NUMBER FROM THE TTY
1341
1342                                  ;;**************************************************************************
1343                                  ;*THIS ROUTINE WILL READ AN OCTAL (ASCII) NUMBER FROM THE TTY AND
1344                                  ;*CHANGE IT TO BINARY.
1345                                  ;*THE INPUT CHARACTERS WILL BE CHECKED TO INSURED THEY ARE LEGAL
```

```
1346                                    ;*OCTAL DIGITS. IF AN ILLEGAL CHARACTER IS READ A ''?'' WILL BE TYPED
1347                                    ;*FOLLOWED BY A CARRIAGE RETURN-LINE FEED. THE COMPLETE NUMBER MUST
1348                                    ;*THEN BE RETYPED. THE INPUT IS TERMINATED BY TYPING A CARRIAGE RETURN.
1349                                    ;*CALL:
1350                                    ;*      RDOCT                   ;;READ AN OCTAL NUMBER
1351                                    ;*      RETURN HERE             ;;LOW ORDER BITS ARE ON TOP OF THE STACK
1352                                    ;*                              ;;HIGH ORDER BITS ARE IN $HIOCT
1353
1354  005560  011646                    $RDOCT: MOV     (SP),-(SP)      ;;PROVIDE SPACE FOR THE
1355  005562  016666  000004  000002            MOV     4(SP),2(SP)     ;;INPUT NUMBER
1356  005570  010046                            MOV     R0,-(SP)        ;;PUSH R0 ON STACK
1357  005572  010146                            MOV     R1,-(SP)        ;;PUSH R1 ON STACK
1358  005574  010246                            MOV     R2,-(SP)        ;;PUSH R2 ON STACK
1359  005576  104403                    1$:     RDLIN                   ;;READ AN ASCIZ LINE
1360  005600  012600                            MOV     (SP)+,R0        ;;GET ADDRESS OF 1ST CHARACTER
1361  005602  010037  005706                    MOV     R0,5$           ;;AND SAVE IT
1362  005606  005001                            CLR     R1              ;;CLEAR DATA WORD
1363  005610  005002                            CLR     R2
1364  005612  112046                    2$:     MOVB    (R0)+,-(SP)     ;;PICKUP THIS CHARACTER
1365  005614  001420                            BEQ     3$              ;;IF ZERO GET OUT
1366  005616  122716  000060                    CMPB    #'0,(SP)        ;;MAKE SURE THIS CHARACTER
1367  005622  003026                            BGT     4$              ;;IS AN OCTAL DIGIT
1368  005624  122716  000067                    CMPB    #'7,(SP)
1369  005630  002423                            BLT     4$
1370  005632  006301                            ASL     R1              ;;*2
1371  005634  006102                            ROL     R2
1372  005636  006301                            ASL     R1              ;;*4
1373  005640  006102                            ROL     R2
1374  005642  006301                            ASL     R1              ;;*8
1375  005644  006102                            ROL     R2
1376  005646  042716  177770                    BIC     #^C7,(SP)       ;;STRIP THE ASCII JUNK
1377  005652  062601                            ADD     (SP)+,R1        ;;ADD IN THIS DIGIT
1378  005654  000756                            BR      2$              ;;LOOP
1379  005656  005726                    3$:     TST     (SP)+           ;;CLEAN TERMINATOR FROM STACK
1380  005660  010166  000012                    MOV     R1,12(SP)       ;;SAVE THE RESULT
1381  005664  010237  005716                    MOV     R2,$HIOCT
1382  005670  012602                            MOV     (SP)+,R2        ;;POP STACK INTO R2
1383  005672  012601                            MOV     (SP)+,R1        ;;POP STACK INTO R1
1384  005674  012600                            MOV     (SP)+,R0        ;;POP STACK INTO R0
1385  005676  000002                            RTI                     ;;RETURN
1386  005700  005726                    4$:     TST     (SP)+           ;;CLEAN PARTIAL FROM STACK
1387  005702  105010                            CLRB    (R0)            ;;SET A TERMINATOR
1388  005704  104401                            TYPE                    ;;TYPE UP THRU THE BAD CHAR.
1389  005706  000000                    5$:     .WORD   0
1390  005710  104401  001312                    TYPE    ,$QUES          ;;''?'' 'CR'' & 'LF''
1391  005714  000730                            BR      1$              ;;TRY AGAIN
1392  005716  000000                    $HIOCT: .WORD   0               ;;HIGH ORDER BITS GO HERE
1393                                    ;
1394                                    ;    INPUT OCTAL NUMBER ROUTINE
1395                                    ;-----------------------------------
1396                                    ;
1397  005720  010546                    $INPUT: MOV     R5,-(SP)                ; SAVE REGISTER R5.
1398  005722  016605  000002                    MOV     2(SP),R5                ; GET FIRST PARAMETER ADDRESS.
1399  005726  012537  005764                    MOV     (R5)+,WHAT              ; GET MESSAGE ADDRESS.
1400  005732  012537  006044                    MOV     (R5)+,LOLIM             ; GET LOW LIMIT FOR THE  #
1401  005736  012537  006046                    MOV     (R5)+,HILIM             ; GET HIGH LIMIT FOR THE #.
```

READ AN OCTAL NUMBER FROM THE TTY

```
1402  005742  012537  006050                MOV     (R5)+,WHERE             ; GET ADDRESS OF INBUFFER
1403  005746  112537  006052                MOVB    (R5)+,LOBITS            ; GET LOWMASK BITS.
1404  005752  112537  006053                MOVB    (R5)+,ADRCNT            ; GET # OF #'S TO BE GENERATED.
1405  005756  010566  000002                MOV     R5,2(SP)                ; SAVE THE RETURN ADDRESS.
1406  005762  104401                INLP1:  TYPE                            ; TYPE THE MESSAGE.
1407  005764  000000                WHAT:   .WORD   0
1408  005766  104404                        RDOCT                           ; READ OCTAL # FROM KEYBOARD.
1409  005770  021637  006046                CMP     (SP),HILIM              ; IS IT IN HIGH LIMIT?
1410  005774  003003                        BGT     2$                      ; BRANCH IF NO.
1411  005776  021637  006044                CMP     (SP),LOLIM              ; IS IT MORE THAN LOW LIMIT.
1412  006002  002005                        BGE     3$                      ; BRANCH IF YES.
1413  006004  104401  001312        2$:     TYPE    ,$QUES                  ; TYPE  '' ? ''
1414  006010  104401  001313                TYPE    ,$CRLF                  ; TYPE <CR>,<LF>
1415  006014  000762                        BR      INLP1                   ;
1416  006016  013705  006050        3$:     MOV     WHERE,R5                ; GET BUFFER ADDRESS.
1417  006022  011625                4$:     MOV     (SP),(R5)+              ; SAVE THE # IN RIGHT PLACE.
1418  006024  062716  000002                ADD     #2,(SP)                 ; NEXT SEQUENTIAL NUMBER.
1419  006030  105337  006053                DECB    ADRCNT                  ; COUNT BY 1.
1420  006034  001372                        BNE     4$                      ; BRANCH IF NOT DONE.
1421  006036  005726                        TST     (SP)+                   ; POP THE STACK POINTER.
1422  006040  012605                        MOV     (SP)+,R5                ; POP THE REG.S
1423  006042  000002                        RTI
1424  006044  000000                LOLIM:  .WORD   0
1425  006046  000000                HILIM:  .WORD   0
1426  006050  000000                WHERE:  .WORD   0
1427  006052     000                 LOBITS: .BYTE   0
1428  006053     000                 ADRCNT: .BYTE   0
1429
1430                                        ;  ADVANCE TO NEXT TEST HANDLER
1431                                        ;-------------------------------
1432                                        ;
1433  006054  013716  001442        .ADVANCE:       MOV     NEXT,(SP)               ; CRUNCH STACK WITH ADDRESSOF SC
1434  006060  005037  001444                CLR     LOCK                    ; RESET TIGHT LOOP ADDRESS
1435  006064  000002                        RTI                             ; CHECK TO SEE IF OLD TEST GETS REPEATED
1436
1437                                        ;SAVE PC OF TEST THAT FAILED AND R0-R5
1438                                        ;-------------------------------------
1439
1440  006066  016637  000004  001460 .SAV05: MOV     4(SP),SAVPC     ;SAVE R7 (PC)
1441
1442                                        ;SAVE R0-R5
1443
1444  006074  010537  001274        SV05:   MOV     R5,$REG5        ;SAVE R5
1445  006100  010437  001272                MOV     R4,$REG4        ;SAVE R4
1446  006104  010337  001270                MOV     R3,$REG3        ;SAVE R3
1447  006110  010237  001266                MOV     R2,$REG2        ;SAVE R2
1448  006114  010137  001264                MOV     R1,$REG1        ;SAVE R1
1449  006120  010037  001262                MOV     R0,$REG0        ;SAVE R0
1450  006124  000002                        RTI                     ;LEAVE.
1451
1452                                        ;RESTORE R0-R5
1453
1454  006126  013700  001262        .RES05: MOV     $REG0,R0        ;RESTORE R0
1455  006132  013701  001264                MOV     $REG1,R1        ;RESTORE R1
1456  006136  013702  001266                MOV     $REG2,R2        ;RESTORE R2
1457  006142  013703  001270                MOV     $REG3,R3        ;RESTORE R3
```

```
1458  006146  013704  001272                          MOV     $REG4,R4        ;RESTORE R4
1459  006152  013705  001274                          MOV     $REG5,R5        ;RESTORE R5
1460  006156  000002                                   RTI                     ;LEAVE
1461
1462                                            ;      ;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER
1463                                            ;      ;-----------------------------------------------------
1464                                            ;
1465  006160  104401  001313                    .CONVR: TYPE    ,$CRLF
1466  006164  010046                            .CNVRT: MOV     R0,-(SP)
1467  006166  010146                                    MOV     R1,-(SP)
1468  006170  010346                                    MOV     R3,-(SP)
1469  006172  010446                                    MOV     R4,-(SP)
1470  006174  010546                                    MOV     R5,-(SP)
1471  006176  017601  000012                           MOV     @12(SP),R1
1472  006202  062766  000002  000012                   ADD     #2,12(SP)
1473  006210  012137  006402                           MOV     (R1)+,WRDCNT
1474  006214  112137  006404                    1$:    MOVB    (R1)+,CHRCNT
1475  006220  112137  006405                           MOVB    (R1)+,SPACNT
1476  006224  013137  006406                           MOV     @(R1)+,BINWRD
1477  006230  122737  000003  006404                   CMPB    #3,CHRCNT
1478  006236  001003                                   BNE     2$
1479  006240  042737  177400  006406                   BIC     #177400,BINWRD
1480  006246  013704  006406                    2$:    MOV     BINWRD,R4
1481  006252  113705  006404                           MOVB    CHRCNT,R5
1482  006256  012700  011122                           MOV     #TEMP,R0
1483  006262  010403                             3$:    MOV     R4,R3
1484  006264  042703  177770                           BIC     #177770,R3
1485  006270  062703  000060                           ADD     #060,R3
1486  006274  110320                                   MOVB    R3,(R0)+
1487  006276  000241                                   CLC
1488  006300  006004                                   ROR     R4
1489  006302  000241                                   CLC
1490  006304  006004                                   ROR     R4
1491  006306  000241                                   CLC
1492  006310  006004                                   ROR     R4
1493  006312  005305                                   DEC     R5
1494  006314  001362                                   BNE     3$
1495  006316  012703  011164                           MOV     #MDATA,R3
1496  006322  114023                             4$:    MOVB    -(R0),(R3)+
1497  006324  105337  006404                           DECB    CHRCNT
1498  006330  001374                                   BNE     4$
1499  006332  105737  006405                           TSTB    SPACNT
1500  006336  001405                                   BEQ     6$
1501  006340  112723  000040                    5$:    MOVB    #040,(R3)+
1502  006344  105337  006405                           DECB    SPACNT
1503  006350  001373                                   BNE     5$
1504  006352  105013                             6$:    CLRB    (R3)
1505  006354  104401  011164                           TYPE    ,MDATA
1506  006360  005337  006402                           DEC     WRDCNT
1507  006364  001313                                   BNE     1$
1508  006366  012605                                   MOV     (SP)+,R5
1509  006370  012604                                   MOV     (SP)+,R4
1510  006372  012603                                   MOV     (SP)+,R3
1511  006374  012601                                   MOV     (SP)+,R1
1512  006376  012600                                   MOV     (SP)+,R0
1513  006400  000002                                   RTI
```

```
1514  006402  000000                  WRDCNT: 0
1515  006404  000000                  CHRCNT: 0
1516          006405                  SPACNT=CHRCNT+1
1517  006406  000000                  BINWRD: 0
1518
1519
1520                                          ;TRAP DISPATCH SERVICE
1521                                          ;ARGUMENT OF TRAP IS EXTRACTED
1522                                          ;AND USED AS OFFSET TO OBTAIN POINTER
1523                                          ;TO SELECTED SUBROUTINE
1524
1525                                  .SBTTL  TRAP DECODER
1526
1527                                  ;;**********************************************************************
1528                                  ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE ''TRAP'' INSTRUCTION
1529                                  ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
1530                                  ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
1531                                  ;*GO TO THAT ROUTINE.
1532
1533  006410  010046                  $TRAP:  MOV     R0,-(SP)        ;;SAVE R0
1534  006412  016600  000002                  MOV     2(SP),R0        ;;GET TRAP ADDRESS
1535  006416  005740                          TST     -(R0)           ;;BACKUP BY 2
1536  006420  111000                          MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
1537  006422  006300                          ASL     R0              ;;POSITION FOR INDEXING
1538  006424  016000  006444                  MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
1539  006430  000200                          RTS     R0              ;;GO TO ROUTINE
1540
1541
1542                                  ;;THIS IS USE TO HANDLE THE ''GETPRI'' MACRO
1543
1544  006432  011646                  $TRAP2: MOV     (SP),-(SP)      ;;MOVE THE PC DOWN
1545  006434  016666  000004  000002          MOV     4(SP),2(SP)     ;;MOVE THE PSW DOWN
1546  006442  000002                          RTI                     ;;RESTORE THE PSW
1547
1548                                  .SBTTL  TRAP TABLE
1549
1550                                  ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
1551                                  ;*BY THE ''TRAP'' INSTRUCTION.
1552
1553                                  ;       ROUTINE
1554                                  ;       -------
1555  006444  006432                  $TRPAD: .WORD   $TRAP2
1556  006446  004410                          $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
1557
1558
1559  006450  005140                          $RDCHR  ;;CALL=RDCHR    TRAP+2(104402)  TTY TYPEIN CHARACTER ROUTINE
1560  006452  005260                          $RDLIN  ;;CALL=RDLIN    TRAP+3(104403)  TTY TYPEIN STRING ROUTINE
1561  006454  005560                          $RDOCT  ;;CALL=RDOCT    TRAP+4(104404)  READ AN OCTAL NUMBER FROM TTY
1562  006456  004360                          .SCOP1  ;;CALL=SCOP1    TRAP+5(104405)  CALL TO LOOP ON CURRENT DATA HAN
1563  006460  006066                          .SAV05  ;;CALL=SAV05    TRAP+6(104406)  CALL TO REGISTER SAVE ROUTINE
1564  006462  006126                          .RES05  ;;CALL=RES05    TRAP+7(104407)  CALL TO REGISTER RESTORE ROUTINE
1565  006464  007356                          .MSTCLR ;;CALL=MSTCLR   TRAP+10(104410) CALL TO ISSUE A MASTER CLEAR
1566  006466  007326                          .DELAY  ;;CALL=DELAY    TRAP+11(104411) CALL TO DELAY
1567  006470  007374                          .ROMCLK ;;CALL=ROMCLK   TRAP+12(104412) CALL TO CLOCK ROM ONCE
1568  006472  007442                          .DATACLK        ;;CALL=DATACLK  TRAP+13(104413) CALL TO CLOCK DATA
1569  006474  007506                          .TIMER  ;;CALL=TIMER    TRAP+14(104414) CALL TO DELAY A CLOCK TICK
```

```
1570  006476  005720                          $INPUT  ;;CALL=INPUT    TRAP+15(104415) CALL TO OCTAL # INPUT ROUTINE
1571  006500  006160                          .CONVRT ;;CALL=CONVRT   TRAP+16(104416) CALL TO    .....
1572  006502  006164                          .CNVRT  ;;CALL=CNVRT    TRAP+17(104417) CALL TO    ......
1573  006504  006054                          .ADVANCE        ;;CALL=ADVANCE  TRAP+20(104420) CALL TO ADVANCE TO NEXT
1574                                  ;
1575                                  ;-----------------------------------------------------------------
1576                                  ;:*****************************************************************
1577                                          ;ERROR HANDLER
1578                                          ;-------------
1579
1580  006506  004737  011226          $ERROR: JSR     PC,CKSWR        ;CHECK FOR SOFT SWR
1581  006512  032777  010000  172520          BIT     #SW12,@SWR      ;BELL ON ERROR?
1582  006520  001406                          BEQ     XBX             ;BR IF NO BELL
1583  006522  105777  172522                  TSTB    @$TPS           ;TTY READY.
1584  006526  100003                          BPL     XBX             ;DON'T WAIT IF TTY NOT READY.
1585  006530  112777  000207  172514          MOVB    #207,@$TPB      ;PUSH A BELL AT THE TTY.
1586  006536  032777  020000  172474  XBX:    BIT     #SW13,@SWR      ;DELETE ERROR PRINT OUT?
1587  006544  001107                          BNE     HALTS           ;BR IF NO PRINT OUT WANTED.
1588  006546  021637  001216                  CMP     (SP),$ERRPC     ;WAS THIS ERROR FOUND LAST TIME?
1589  006552  001404                          BEQ     1$              ;BR IF YES
1590  006554  011637  001216                  MOV     (SP),$ERRPC     ;RECORD BEING HERE
1591  006560  105037  001203                  CLRB    $ERFLG          ;PREPARE HEADER
1592  006564  104406                  1$:     SAV05                   ;SAVE ALL PROC REGISTERS
1593  006566  011605                          MOV     (SP),R5         ;GET THE PC OF ERROR
1594  006570  162705  000002                  SUB     #2,R5           ;GET ADDRESS OF TRAP CALL
1595  006574  011504                          MOV     (R5),R4         ;GET ERROR INSTRUCTION
1596  006576  110437  001214                  MOVB    R4,$ITEMB       ; COPY ERROR # FOR APT HANDLING
1597  006602  006304                          ASL     R4              ;MULT BY TWO
1598  006604  061504                          ADD     (R5),R4         ;DOUBLE IT
1599  006606  006304                          ASL     R4              ;MULT AGAIN
1600  006610  042704  177001                  BIC     #177001,R4      ;CLEAR JUNK
1601  006614  062704  001512                  ADD     #$ERRTB,R4      ;GET POINTER
1602  006620  012437  006734                  MOV     (R4)+,ERRMSG    ;GET ERROR MESSAGE
1603  006624  012437  006746                  MOV     (R4)+,DATAHD    ;GET DATA HEADRER
1604  006630  011437  006760                  MOV     (R4),DATABP     ;GET DATA TABLE
1605  006634  105737  001203                  TSTB    $ERFLG          ;TYPE HEADREER
1606  006640  001403                          BEQ     TYPMSG          ;BR IF YES
1607  006642  005737  006760                  TST     DATABP          ;DOES DATA TABLE EXIST?
1608  006646  001040                          BNE     TYPDAT          ;BR IF YES.
1609  006650  104401  001313  TYPMSG: TYPE    ,$CRLF
1610  006654  104401  001313          TYPE    ,$CRLF
1611  006660  005737  001444          TST     LOCK
1612  006664  001402                  BEQ     1$
1613  006666  104401  010011          TYPE    ,MASTEK
1614  006672  104401  007777  1$:     TYPE    ,MTSTN
1615  006676  104417  007114          CNVRT   ,XTSTN          ;SHOW IT
1616  006702  104401  010066          TYPE    ,MERRPC         ;TYPE PC.
1617  006706  104417  007106          CNVRT   ,ERTAB0         ;SHOW IT
1618  006712  104401  001313          TYPE    ,$CRLF          ;GIVE A CR/LF
1619  006716  112737  177777  001203  MOVB    #-1,$ERFLG      ;NO MORE HEADER UNLESS NO DATA TABLE.
1620  006724  005737  006734          TST     ERRMSG          ;IS THERE AN ERROR MESSAGE?
1621  006730  001402                  BEQ     WRKO.FM         ;BR IF NO.
1622  006732  104401                  TYPE                    ;TYPE
1623  006734  000000          ERRMSG: 0                       ;     ERROR MESSAGE
1624  006736                  WRKO.FM:                        ;
1625  006736  005737  006746          TST     DATAHD          ;DATA HEADER?
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```
1626  006742  001402                        BEQ     TYPDAT          ;BR IF NO
1627  006744  104401                        TYPE                    ;TYPE
1628  006746  000000                DATAHD: 0                       ;     DATA HEADER
1629  006750  005737  006760        TYPDAT: TST     DATABP          ;DATA TABLE?
1630  006754  001402                        BEQ     RESREG          ;BR IF NO.
1631  006756  104416                        CONVRT                  ;SHOW
1632  006760  000000                DATABP: 0                       ;     DATA TABLE
1633  006762  104407                RESREG: RES05                   ;RESTORE PROC REGISTERS
1634  006764  122737  000001  001336 HALTS:  CMPB    #APTENV,$ENV    ; IS APT RUNNING ?
1635  006772  001007                        BNE     3$              ; SKIP APT CALL IF NOT.
1636  006774  113737  001214  007006        MOVB    $ITEMB,6$       ; COPY ERROR #.
1637  007002  004737  004710                JSR     PC,$ATY4        ; CALL APT SERVICES.
1638  007006  000000                6$:     .WORD   0               ; ERROR # GOES HERE.
1639  007010  000777                9$:     BR      9$              ; LOCK HERE.
1640  007012  022737  004070  000042 3$:     CMP     #$ENDAD,@#42    ;IF ACT-11 AUTOMATIC MODE, HALT!!
1641  007020  001403                        BEQ     1$
1642  007022  005777  172212                TST     @SWR            ;HALT ON ERROR?
1643  007026  100005                        BPL     EXITER          ;BR IF NO HALT ON ERROR
1644  007030  010046                1$:     PUSHR0                  ;SAVE R0
1645  007032  016600  000002                MOV     2(SP),R0        ;SHOW ERROR PC IN DATA LIGHTS
1646  007036  000000                        HALT                    ;HALT
1647  007040  012600                        POPR0                   ;GET R0
1648  007042  005237  001212        EXITER: INC     $ERTTL          ;UPDATE ERROR COUNT
1649  007046  032777  000400  172164        BIT     #SW08,@SWR      ;GOTO TOP OF TEST?
1650  007054  001007                        BNE     1$              ;BR IF YES
1651  007056  032777  002000  172154        BIT     #SW10,@SWR      ;GOTO NEXT TEST?
1652  007064  001407                        BEQ     2$              ;BR IF NO
1653  007066  013737  001442  001206        MOV     NEXT,$LPADR     ;SET FOR NEXT TEST
1654  007074  012706  001200        1$:     MOV     #STACK,SP       ;RESET SP
1655  007100  000177  172102                JMP     @$LPADR         ;GOTO SPECIFIED TEST
1656  007104  000002                2$:     RTI                     ;$LPADR
1657  007106  000001                ERTABO: 1
1658  007110     006     002                .BYTE   6,2
1659  007112  001460                        SAVPC
1660  007114  000001                XTSTN:  1
1661  007116     003     002                .BYTE   3,2
1662  007120  001202                        $TSTNM
1663                                        ;ENTER HERE ON POWER FAILURE
1664                                        ;--------------------------
1665
1666                                .SBTTL  POWER DOWN AND UP ROUTINES
1667
1668                                ;;**************************************************************************
1669                                ;POWER DOWN ROUTINE
1670  007122  012737  007312  000024 $PWRDN: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST UP
1671  007130  012737  000340  000026        MOV     #340,@#PWRVEC+2 ;;PRIO:7
1672  007136  010046                        MOV     R0,-(SP)        ;;PUSH R0 ON STACK
1673  007140  010146                        MOV     R1,-(SP)        ;;PUSH R1 ON STACK
1674  007142  010246                        MOV     R2,-(SP)        ;;PUSH R2 ON STACK
1675  007144  010346                        MOV     R3,-(SP)        ;;PUSH R3 ON STACK
1676  007146  010446                        MOV     R4,-(SP)        ;;PUSH R4 ON STACK
1677  007150  010546                        MOV     R5,-(SP)        ;;PUSH R5 ON STACK
1678  007152  017746  172062                MOV     @SWR,-(SP)      ;;PUSH @SWR ON STACK
1679  007156  010637  007316                MOV     SP,$SAVR6       ;;SAVE SP
1680  007162  012737  007174  000024        MOV     #$PWRUP,@#PWRVEC ;;SET UP VECTOR
1681  007170  000000                        HALT
```

```
1682  007172  000776                          BR      .-2             ;;HANG UP
1683
1684
1685                                  ;;*****************************************************************
1686  007174  012737  007312  000024  ;POWER UP ROUTINE
1687  007202  013706  007316  $PWRUP: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST DOWN
1688  007206  005037  007316          MOV     $SAVR6,SP       ;;GET SP
1689  007212  005237  007316          CLR     $SAVR6          ;;WAIT LOOP FOR THE TTY
1690  007216  001375          1$:     INC     $SAVR6          ;;WAIT FOR THE INC
1691  007220  104401  007556          BNE     1$              ;;OF  WORD
1692  007224  104417  007320          TYPE    ,MPFAIL         ;
1693  007230  105037  001203          CNVRT   ,PFTAB          ;
1694  007234  005037  001216          CLRB    $ERFLG          ;CLEAR ERROR FLAG.
1695  007240  013701  002066          CLR     $ERRPC          ; CLEAR LAST ERROR PC
1696  007244  005011                  MOV     KMCSR,R1        ; RESTORE DEVICE ADDRESS.
1697  007246  104410                  CLR     (R1)            ; CLEAR THE CSR.
1698  007250  012677  171764          MSTCLR                  ;
1699  007254  012605                  MOV     (SP)+,@SWR      ;;POP STACK INTO @SWR
1700  007256  012604                  MOV     (SP)+,R5        ;;POP STACK INTO R5
1701  007260  012603                  MOV     (SP)+,R4        ;;POP STACK INTO R4
1702  007262  012602                  MOV     (SP)+,R3        ;;POP STACK INTO R3
1703  007264  012601                  MOV     (SP)+,R2        ;;POP STACK INTO R2
1704  007266  012600                  MOV     (SP)+,R1        ;;POP STACK INTO R1
1705  007270  012737  007122  000024  MOV     (SP)+,R0        ;;POP STACK INTO R0
1706  007276  012737  000340  000026  MOV     #$PWRDN,@#PWRVEC ;;SET UP THE POWER DOWN VECTOR
1707  007304  104401                  MOV     #340,@#PWRVEC+2 ;;PRIO:7
1708  007306  007556          $PWRMG: TYPE                    ;;REPORT THE POWER FAILURE
1709  007310  000002                  .WORD   MPFAIL          ;;POWER FAIL MESSAGE POINTER
1710  007312  000000          $ILLUP: RTI
1711  007314  000776                  HALT                    ;;THE POWER UP SEQUENCE WAS STARTED
1712  007316  000000                  BR      .-2             ;; BEFORE THE POWER DOWN WAS COMPLETE
1713                          $SAVR6: 0                       ;;PUT THE SP HERE
1714  007320  000001
1715  007322     003     002  PFTAB:  1
1716  007324  001202          .BYTE   3,2
1717                                  $TSTNM
1718  007326                  .DELAY:
1719  007326  012777  000020  172540          MOV     #20,@KMP04
1720  007334  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
1721  007336  121111                          121111                  ;POKE CLOCK DELAY BIT
1722  007340                          1$:
1723  007340  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
1724  007342  121224                          121224                  ;PORT4_IBUS*11
1725  007344  032777  000020  172522          BIT     #BIT4,@KMP04    ;IS CLOCK BIT SET?
1726  007352  001772                          BEQ     1$              ;BR IF NO
1727  007354  000002                          RTI
1728
1729  007356                  .MSTCLR:
1730  007356  152777  000100  172504          BISB    #BIT6,@KMCSRH   ;SET MASTER CLEAR
1731  007364  142777  000300  172476          BICB    #BIT6!BIT7,@KMCSRH  ;CLEAR MASTER CLEAR AND RUN
1732  007372  000002                          RTI                     ;RETURN
1733
1734  007374                  .ROMCLK:
1735  007374  152777  000002  172466          BISB    #BIT1,@KMCSRH   ;SET ROMI
1736  007402  013677  172470                  MOV     @(SP)+,@KMP06   ;LOAD INSTRUCTION IN SEL6
1737  007406  062746  000002                  ADD     #2,-(SP)        ;ADJUST STACK
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1738  007412  032777  000100  171620          BIT     #SW06,@SWR      ;HALT IF SW06 -1
1739  007420  001401                          BEQ     1$              ;BR IF SW06 =0
1740  007422  000000                          HALT                    ;HALT BEFORE CLOCKING INSTRUCTION
1741  007424  152777  000003  172436  1$:     BISB    #BIT1!BIT0,@KMCSRH ;CLOCK INSTRUCTION
1742  007432  142777  000007  172430          BICB    #BIT2!BIT1!BIT0,@KMCSRH  ;CLEAR ROMO, ROMI, STEP
1743  007440  000002                          RTI
1744
1745  007442                          .DATACLK:
1746  007442  013637  011122                  MOV     @(SP)+,TEMP     ;PUT TICK COUNT IN TEMP
1747  007446  062746  000002                  ADD     #2,-(SP)        ;ADJUST STACK
1748  007452  152777  000020  172410  1$:     BISB    #BIT4,@KMCSRH   ;SET STEP LU
1749  007460  027777  172402  172400          CMP     @KMCSR,@KMCSR   ;WASTE TIME
1750  007466  142777  000020  172374          BICB    #BIT4,@KMCSRH   ;CLEAR STEP LU
1751  007474  005337  011122                  DEC     TEMP            ;DEC TICK COUNT
1752  007500  001364                          BNE     1$              ;BR IF NOT DONE
1753  007502  000002                          RTI                     ;RETURN
1754  007504  000001                  3$:     .BLKW 1
1755
1756  007506                          .TIMER:
1757  007506  013637  011122                  MOV     @(SP)+,TEMP     ;MOVE COUNT TO TEMP
1758  007512  062746  000002                  ADD     #2,-(SP)        ;ADJUST STACK
1759  007516                          1$:
1760  007516  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC 5304
1761  007520  021364                          021364                  ;PORT4 IBUS* REG11
1762  007522  032777  000002  172344          BIT     #2,@KMP04       ;IS PGM CLOCK BIT CLEAR?
1763  007530  001772                          BEQ     1$              ;BR IF YES
1764  007532                          2$:
1765  007532  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC 5304
1766  007534  021364                          021364                  ;PORT4 IBUS* REG11
1767  007536  032777  000002  172330          BIT     #2,@KMP04       ;IS PGM CLOCK BIT SET?
1768  007544  001372                          BNE     2$              ;BR IF YES
1769  007546  005337  011122                  DEC     TEMP            ;DEC COUNT
1770  007552  001361                          BNE     1$              ;BR IF NOT DONE
1771  007554  000002                          RTI                     ;RETURN
1772
1773  007556  050200  051127  043040  MPFAIL: .ASCIZ   <200>/PWR FAILED. RESTART AT TEST /
 (2)  007614  042600  042116  050040  MEPASS: .ASCIZ   <200>/END PASS CZKCG  /
 (2)  007636  051200     000  MR:     .ASCIZ   <200>/R/
 (2)  007641     200  047516  042040  MERR2:  .ASCIZ   <200>/NO DEVICES PRESENT./
 (2)  007666  044600  051516  043125  MERR3:  .ASCIZ   <200>/INSUFFICIENT DATA!/
 (2)  007712  046200  041517  020113  MLOCK:  .ASCIZ   <200>/LOCK ON SELECTED TEST/
 (2)  007741     103  051123  020072  MCSRX:  .ASCIZ    /CSR: /
 (2)  007747     126  041505  020072  MVECX:  .ASCIZ   /VEC: /
 (2)  007755     120  051501  042523  MPASSX: .ASCIZ   /PASSES: /
 (2)  007766  051105  047522  051522  MERRX:  .ASCIZ   /ERRORS: /
 (2)  007777     124  051505  020124  MTSTN:  .ASCIZ   /TEST NO: /
 (2)  010011     052     000  MASTEK: .ASCIZ   /*/
 (2)  010013     200  042523  020124  MNEW:   .ASCIZ   <200>/SET SWITCH REG TO KMC11'S DESIRED ACTIVE./
 (2)  010066  041520  020072     000  MERRPC: .ASCIZ   /PC: /
 (2)  010073     200  020040  020040  XHEAD:  .ASCII   <200>/            MAP OF KMC11 STATUS/
 (2)  010132  020200  020040  020040          .ASCII   <200>/            ------------------/
 (2)  010171     200  020040  041520          .ASCII   <200>/  PC      CSR     STAT1    STAT2    STAT3/
 (2)  010243     200  026455  026455          .ASCIZ   <200>/------   ------   ------   ------   ------/
 (2)  010317     200  047510  020127  NUM:    .ASCIZ   <200>/HOW MANY KMC11'S TO BE TESTED?/
 (2)  010357     200  051503  020122  CSR:    .ASCIZ   <200>/CSR ADDRESS?/
 (2)  010375     200  042526  052103  VEC:    .ASCIZ   <200>/VECTOR ADDRESS?/
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   (2)  010416  041200  020122  051120          PRIO:   .ASCIZ  <200>/BR PRIORITY LEVEL? (4,5,6,7)?/
   (2)  010455     200  044127  041511          MODU:   .ASCIZ  <200>/WHICH LINE UNIT? IF NONE TYPE 'N', IF M8201 TYPE 'T', IF M
   (2)  010567     200  053523  052111          LINE:   .ASCIZ  <200>/SWITCH PAC#1 (DDCMP LINE #)?/
   (2)  010625     200  053523  052111          BM:     .ASCIZ  <200>/SWITCH PAC#2 (BM873 BOOT ADD)?/
   (2)  010665     200  051511  052040          CONN:   .ASCIZ  <200>/IS THE LOOP BACK CONNECTOR ON?/
   (2)  010725     200  047516  042040          NOACT:  .ASCIZ  <200>/NO DEVICES ARE SELECTED/
   (2)  010756  100200  046513  030503          CONERR: .ASCIZ  <200><200>/KMC11 AT NONSTANDARD ADDRESS  PC: /
   (2)  011023     200  054105  042520          CNERR:  .ASCIZ  <200>/EXPECTED  FOUND/
   (2)  011044  024040  046513  024503          KMCM:   .ASCIZ  / (KMC) /
   (2)  011054  046040  040517  044504          MLDER:  .ASCIZ  / LOADING ERROR /
   (2)                                          .EVEN
   (2)  011074  000005                          XSTATQ: 5
1774    011076     006       003                        .BYTE   6,3
1775    011100  001276                                  $TMP0
1776    011102     006       003                        .BYTE   6,3
1777    011104  001300                                  $TMP1
1778    011106     006       003                        .BYTE   6,3
1779    011110  001302                                  $TMP2
1780    011112     006       003                        .BYTE   6,3
1781    011114  001304                                  $TMP3
1782    011116     006       002                        .BYTE   6,2
1783    011120  001306                                  $TMP4
1784                                         .EVEN
1785
1786                                                    ;BUFFERS FOR INPUT-OUTPUT
1787
1788    011122  000000                       TEMP:   0
1789            011164                       .=.+40
1790    011164  000000                       MDATA:  0
1791            011226                       .=.+40
1792
1793
1794                                                    ;ROUTINE USED TO CHANGE SOFTWARE SWITCH
1795                                                    ;REGISTER USING THE CONSOLE TERMINAL
1796                                                    ;-----------------------------------
1797
1798    011226  022737  000176  001240  CKSWR:  CMP     #SWREG,SWR      ;IS THE SOFT SWR BEING USED?
1799    011234  001075                   BNE     CKSWR5          ;BR IF NO
1800    011236  132737  000001  001336   BITB    #1,$ENV         ; IS IT RUNNING UNDER APT?
1801    011244  001071                   BNE     CKSWR5          ; EXIT IF YES.
1802    011246  022777  000007  167772   CMP     #7,@$TKB        ;WAS CTRL G TYPED? (7 BIT ASCII)
1803    011254  001404                   BEQ     1$              ;BR IF YES
1804    011256  022777  000207  167762   CMP     #207,@$TKB      ;WAS CTRL G TYPED? (8 BIT ASCII)
1805    011264  001061                   BNE     CKSWR5          ;BR IF NO
1806    011266  010246           1$:     MOV     R2,-(SP)        ;STORE R2
1807    011270  010346                   MOV     R3,-(SP)        ;STORE R3
1808    011272  010446                   MOV     R4,-(SP)        ;STORE R4
1809    011274  012737  177777  011432   MOV     #-1,SWFLG       ;SET SOFT TYPE OUT FLAG
1810    011302  005002           CKSWR1: CLR     R2              ;CLEAR NEW SWR CONTENTS
1811    011304  012704  177777           MOV     #-1,R4          ;SET FLAG TO ALL ONES
1812    011310  104401  005535           TYPE    ,$MSWR          ;TYPE 'SWR= '
1813    011314  104417           CKSWR2: CNVRT                   ;TYPE OUT PRESENT CONTENTS
1814    011316  011466                   SOFTSW                  ;OF SOFT SWITCH REGISTER
1815    011320  104401  005546   CKSWR3: TYPE    ,$MNEW          ;TYPE 'NEW? '
1816    011324  004737  011434   CKSWR4: JSR     PC,INCHAR       ;GET RESPONSE
1817    011330  022703  000015           CMP     #15,R3          ;WAS IT A CR?
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1818  011334  001424                          BEQ     5$              ;BR IF YES
1819  011336  022703  000012                  CMP     #12,R3          ;WAS IT A LF?
1820  011342  001416                          BEQ     4$              ;BR IF YES
1821  011344  022703  000025                  CMP     #25,R3          ;WAS IT CTRL U?
1822  011350  001754                          BEQ     CKSWR1          ;BR IF YES(START OVER)
1823  011352  022703  000007                  CMP     #7,R3           ;IF CNTL G GET NEXT CHAR
1824  011356  001762                          BEQ     CKSWR4
1825  011360  005004                          CLR     R4              ;IT MUST BE A DIGIT SO CLR FLAG
1826  011362  042703  177770                  BIC     #177770,R3      ;ONLY 0-7 ARE LEGAL SO MASK OFF BITS
1827  011366  006302                          ASL     R2              ;SHIFT R2 3 TIMES
1828  011370  006302                          ASL     R2
1829  011372  006302                          ASL     R2
1830  011374  050302                          BIS     R3,R2           ;ADD LAST DIGIT
1831  011376  000752                          BR      CKSWR4          ;GET NEXT CHARACTER
1832  011400  012766  002402  000006  4$:     MOV     #.START,6(SP)   ;LF WAS TYPED SO GO TO START
1833  011406  005704            5$:     TST     R4              ;IS FLAG CLEAR?
1834  011410  001002                          BNE     6$              ;IF NOT DON'T CHANGE SOFT SWR
1835  011412  010277  167622                  MOV     R2,@SWR         ;IF YES THEN WRITE NEW CONTENTS TO SOFT SWR
1836  011416  005037  011432          6$:     CLR     SWFLG           ;CLEAR TYPEOUT FLAG
1837  011422  012604                          MOV     (SP)+,R4        ;RESTORE R4
1838  011424  012603                          MOV     (SP)+,R3        ;RESTORE R3
1839  011426  012602                          MOV     (SP)+,R2        ;RESTORE R2
1840  011430  000207            CKSWR5: RTS     PC              ;RETURN
1841
1842  011432  000000            SWFLG:  0
1843
1844  011434  105777  167604    INCHAR: TSTB    @$TKS
1845  011440  100375                          BPL     .-4
1846  011442  017703  167600                  MOV     @$TKB,R3
1847  011446  105777  167576                  TSTB    @$TPS
1848  011452  100375                          BPL     .-4
1849  011454  010377  167572                  MOV     R3,@$TPB
1850  011460  042703  000200                  BIC     #BIT7,R3
1851  011464  000207                          RTS     PC
1852
1853  011466  000001            SOFTSW: 1
1854  011470  000006  000002                  .BYTE   6,2
1855  011472  000176                          SWREG
```

```
1856
1857
1858                                        ;
1859                                        ;ROUTINE USED TO ''CYCLE'' THROUGH UP TO 16 KMC11'S
1860                                        ;THIS ROUTINE SETS UP THE CONTROL ADDRESS FOR THE DIAGNOSTIC
1861                                        ;AND RUNS THE SPECIFIED KMC11'S.   THIS ROUTINE *MUST*
1862                                        ;BE RUN FIRST BEFORE ENTERING THE DIAGNOSTIC FOR THE
1863                                        ;SETUP NECESSARY.
1864                                        ;
1865  011474  005737  001470          CYCLE: TST     KMACTV          ;ARE ANY KMC11'S TO BE TESTED?
1866  011500  001004                         BNE     1$              ;BR IF OK.
1867  011502  104401  010725                 TYPE    ,NOACT          ;NO KMC11'S SELECTED!!
1868  011506  000000                         HALT                    ;STOP THE SHOW.
1869  011510  000776                         BR      .-2             ;DISQUALIFY CONT. SW.
1870  011512  000241                  1$:    CLC                     ;CLEAR PROC. CARRY BIT.
1871  011514  006137  001500                 ROL     RUN             ;UPDATE POINTER
1872  011520  005537  001500                 ADC     RUN             ;CATCH CARRY FROM RUN
1873  011524  062737  000004  001504         ADD     #4,MILK         ;UPDATE POINTER
1874  011532  062737  000010  001502         ADD     #10,CREAM       ;UPDATE ADDRESS POINTER.
1875  011540  022737  002300  001502         CMP     #KM.MAP+200,CREAM
1876  011546  001006                         BNE     2$              ;KEEP GOING; NOT ALL TESTED FOR.
1877  011550  012737  002100  001502         MOV     #KM.MAP,CREAM   ;RESET ADDRESS POINTER.
1878  011556  012737  002302  001504         MOV     #CNT.MAP,MILK   ;RESET PASS COUNT POINTER
1879  011564  033737  001500  001470  2$:    BIT     RUN,KMACTV      ;IS THIS ONE ACTIVE?
1880  011572  001747                         BEQ     1$              ;BR IF NO
1881  011574  013700  001502                 MOV     CREAM,R0        ;GET ADDRESS POINTER
1882  011600  013702  001504                 MOV     MILK,R2         ;GET PASS COUNT POINTER
1883  011604  012037  002066                 MOV     (R0)+,KMCSR     ;LOAD SYSTEM CTRL. REG
1884  011610  011037  002056                 MOV     (R0),KMRVEC     ;LOAD VECTOR
1885  011614  042737  177000  002056         BIC     #177000,KMRVEC  ;CLEAR UNWANTED BITS
1886  011622  012037  002050                 MOV     (R0)+,STAT1     ;LOAD STAT1
1887  011626  012037  002052                 MOV     (R0)+,STAT2     ;LOAD STAT2
1888  011632  012037  002054                 MOV     (R0)+,STAT3     ;LOAD STAT3
1889  011636  012237  001324                 MOV     (R2)+,$PASS     ;LOAD PASS COUNT
1890  011642  012237  001212                 MOV     (R2)+,$ERTTL    ;LOAD ERROR COUNT
1891  011646  012700  000002                 MOV     #2,R0           ;SAVE CORE THIS WAY!
1892  011652  013737  002066  002070         MOV     KMCSR,KMCSRH
1893  011660  005237  002070                 INC     KMCSRH
1894  011664  013737  002070  002072         MOV     KMCSRH,KMCTL
1895  011672  005237  002072                 INC     KMCTL
1896  011676  013737  002072  002074         MOV     KMCTL,KMP04
1897  011704  060037  002074                 ADD     R0,KMP04
1898  011710  013737  002074  002076         MOV     KMP04,KMP06
1899  011716  060037  002076                 ADD     R0,KMP06
1900
1901  011722  013737  002056  002060         MOV     KMRVEC,KMRLVL   ;PTY LVL
1902  011730  060037  002060                 ADD     R0,KMRLVL       ;
1903  011734  013737  002060  002062         MOV     KMRLVL,KMTVEC   ;TX VEC
1904  011742  060037  002062                 ADD     R0,KMTVEC       ;
1905  011746  013737  002062  002064         MOV     KMTVEC,KMTLVL   ;TX LVL
1906  011754  060037  002064                 ADD     R0,KMTLVL
1907
1908  011760  032737  000002  001446         BIT     #SW01,STRTSW    ;IS TEST NO. SELECTED
1909  011766  001447                         BEQ     7$              ;BR IF NO
1910  011770                           4$:
1911  011770  005737  000042                 TST     @#42            ;RUNNING IN AUTO MODE?
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1912  011774  001044                          BNE     7$              ;BR IF YES
1913  011776  104401  001313                  TYPE    ,$CRLF
1914  012002  104415                          INPUT
1915  012004  007777                          MTSTN
1916  012006  000001                          1
1917  012010  001000                          1000
1918  012012  001202                          $TSTNM
1919  012014     000                  .BYTE   0
1920  012015     001                  .BYTE   1
1921  012016  012700  013762                  MOV     #TST1,R0
1922  012022  022710                  5$:     CMP     (PC)+,(R0)      ;CMP FIRST WORD TO 12737
1923  012024  012737                          MOV     (PC)+,@(PC)+
1924  012026  001020                          BNE     6$              ;BR IF NOT SAME
1925  012030  023760  001202  000002          CMP     $TSTNM,2(R0)    ;DOES $TSTNM MATCH?
1926  012036  001014                          BNE     6$              ;BR IF NO
1927  012040  022760  001202  000004          CMP     #$TSTNM,4(R0)   ;IS LAST WORD OK?
1928  012046  001010                          BNE     6$              ;BR IF NO
1929  012050  010037  001206                  MOV     R0,$LPADR       ;IT IS A LEGAL TEST SO DO IT
1930  012054  104401  007636                  TYPE    ,MR
1931  012060  042737  000002  001446          BIC     #SW01,STRTSW
1932  012066  000412                          BR      8$
1933  012070  005720                  6$:     TST     (R0)+           ;POP R0
1934  012072  020027  016400                  CMP     R0,#TLAST+10    ;AT END YET?
1935  012076  001351                          BNE     5$              ;BR IF NO
1936  012100  104401  001312                  TYPE    ,$QUES          ;YES ILLEGAL TEST NO.
1937  012104  000731                          BR      4$              ;TRY AGAIN
1938
1939  012106  012737  013762  001206  7$:     MOV     #TST1,$LPADR    ;PREPARE $LPADR ADDRESS
1940  012114  013701  002066          8$:     MOV     KMCSR,R1        ;R1 = BASE KMC11 ADDRESS
1941  012120  000177  167062                  JMP     @$LPADR         ;GO START TESTING.
1942
1943
1944                                          ;ROUTINE USED TO ''AUTO SIZE'' THE KMC11
1945                                          ;CSR AND VECTOR.
1946                                          ;NOTE:  THE CSR MAY BE ANY WHERE IN THE FLOATING
1947                                          ;       ADDRESS RANGE (160000:164000)
1948                                          ;       AND THE VECTOR MAY BE ANY WHERE IN THE
1949                                          ;       FLOATING VECTOR RANGE (300:770)
1950                                          ;
1951
1952  012124                          AUTO.SIZE:
1953  012124  000005                          RESET                   ;INSURE A BUS INIT.
1954  012126  012702  002100          CSRMAP: MOV     #KM.MAP,R2      ;LOAD MAP POINTER.
1955  012132  005022                  1$:     CLR     (R2)+           ;ZERO ENTIRE MAP
1956  012134  022702  002300                  CMP     #KM.END,R2      ;ALL DONE?
1957  012140  001374                          BNE     1$              ;BR IF NO
1958  012142  005037  001472                  CLR     KMNUM           ;SET OCTAL NUMBER OF KMC11'S TO 0
1959  012146  012702  002100                  MOV     #KM.MAP,R2      ;R2 POINTS TO KMC MAP
1960  012152  005037  001470                  CLR     KMACTV          ;CLEAR ACTIVE
1961  012156  032737  000001  001446          BIT     #SW00,STRTSW    ;QUESTIONS?
1962  012164  001002                          BNE     .+6             ;BR IF YES
1963  012166  000137  012554                  JMP     7$              ;IF NO SKIP QUESTIONS
1964  012172  012737  000001  001306          MOV     #1,$TMP4        ;START WITH 1
1965  012200  104415                          INPUT
1966  012202  010317                          NUM
1967  012204  000001                          1
```

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 1968  012206  000020                                    16.
 1969  012210  001302                                    $TMP2
 1970  012212     000                                    .BYTE   0
 1971  012213     001                                    .BYTE   1
 1972  012214  013737  001302  001472                    MOV     $TMP2,KMNUM     ;KMNUM - HOW MANY
 1973  012222  104401  001313              12$:          TYPE    ,$CRLF
 1974  012226  104416                                    CONVRT                  ;TYPE WHICH KMC IS BEING DONE
 1975  012230  013214                                    WHICH                   ;$TMP4 IS WHICH KMC
 1976  012232  005237  001306                            INC     $TMP4
 1977  012236  104415                                    INPUT
 1978  012240  010357                                    CSR
 1979  012242  160000                                    160000
 1980  012244  164000                                    164000
 1981  012246  001304                                    $TMP3
 1982  012250     000                                    .BYTE   0
 1983  012251     001                                    .BYTE   1
 1984  012252  013722  001304                            MOV     $TMP3,(R2)+     ;STORE CSR IN MAP
 1985  012256  104415                                    INPUT
 1986  012260  010375                                    VEC
 1987  012262  000000                                    0
 1988  012264  000776                                    776
 1989  012266  001304                                    $TMP3
 1990  012270     000                                    .BYTE   0
 1991  012271     001                                    .BYTE   1
 1992  012272  013712  001304                            MOV     $TMP3,(R2)      ;STORE VECTOR IN MAP
 1993  012276  104401              10$:          TYPE
 1994  012300  010416                                    PRIO                    ;ASK WHAT BR LEVEL
 1995  012302  004737  013506                            JSR     PC,INTTY        ;GET RESPONSE
 1996  012306  022703  000024                            CMP     #24,R3          ;
 1997  012312  101014                                    BHI     50$             ;BR IF LESS THAN 4
 1998  012314  022703  000027                            CMP     #27,R3          ;
 1999  012320  103411                                    BLO     50$             ;BR IF GREATER THAN 7
 2000  012322  012704  000011                            MOV     #11,R4          ;R4 = NUMBER OF SHIFTS
 2001  012326  006303                                    ASL     R3              ;SHIFT R3 LEFT
 2002  012330  005304                                    DEC     R4              ;DEC SHIFT COUNT
 2003  012332  001375                                    BNE     .-4             ;BR IF NOT DONE
 2004  012334  042703  170777                            BIC     #170777,R3      ;BIC UNWANTED BITS
 2005  012340  050312                                    BIS     R3,(R2)         ;PUT BR LEVEL IN STATUS MAP
 2006  012342  000403                                    BR      8$              ;CONTINUE
 2007  012344  104401              50$:          TYPE
 2008  012346  001312                                    $QUES                   ;RESPONSE IS OUT OF LIMITS
 2009  012350  000752                                    BR      10$             ;TRY AGAIN
 2010  012352                      8$:
 2011  012352                      9$:
 2012  012352  104401              16$:          TYPE
 2013  012354  010455                                    MODU                    ;ASK WHICH LINE UNIT
 2014  012356  004737  013506                            JSR     PC,INTTY        ;GET REPLY
 2015  012362  022703  000021                            CMP     #21,R3          ;'1'
 2016  012366  001422                                    BEQ     30$
 2017  012370  022703  000022                            CMP     #22,R3          ;'2'
 2018  012374  001412                                    BEQ     31$
 2019  012376  022703  000116                            CMP     #116,R3         ;'N'
 2020  012402  001403                                    BEQ     32$
 2021  012404  104401                                    TYPE
 2022  012406  001312                                    $QUES                   ;IF NOT A 1,2 OR N TYPE '?'
 2023  012410  000760                                    BR      16$             ;TRY AGIAN
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2024  012412  052722  010000          32$:    BIS     #BIT12,(R2)+    ;SET BIT 12 IN STAT2 IF NO LU
2025  012416  022222                          CMP     (R2)+,(R2)+     ;POP OVER STAT2 AND STAT3
2026  012420  000450                          BR      33$
2027  012422  052712  020000          31$:    BIS     #BIT13,(R2)     ;SET BIT 13 IN STAT2 IF M8202
2028  012426  052762  000002  000004          BIS     #BIT1,4(R2)     ;SET BIT1 IN STAT3 FOR HIGH SPEED MICRO-CODE.
2029  012434  104401                  30$:    TYPE
2030  012436  010665                          CONN                    ;ASK IF LOOP-BACK IS ON
2031  012440  004737  013506                  JSR     PC,INTTY        ;GET REPLY
2032  012444  022703  000131                  CMP     #131,R3         ;Y
2033  012450  001406                          BEQ     17$
2034  012452  022703  000116                  CMP     #116,R3         ;N
2035  012456  001406                          BEQ     18$
2036  012460  104401                          TYPE
2037  012462  001312                          $QUES                   ;IF NOT Y OR N TYPE ''?''
2038  012464  000763                          BR      30$             ;TRY AGAIN
2039  012466  052722  040000          17$:    BIS     #BIT14,(R2)+    ;TURNAROUND IS CONNECTED
2040  012472  000402                          BR      19$
2041  012474  042722  040000          18$:    BIC     #BIT14,(R2)+    ;NO TURNAROUND
2042  012500                          19$:
2043  012500  104415                          INPUT
2044  012502  010567                          LINE
2045  012504  000000                          0
2046  012506  000377                          377
2047  012510  001304                          $TMP3
2048  012512     000                          .BYTE   0
2049  012513     001                          .BYTE   1
2050  012514  113722  001304                  MOVB    $TMP3,(R2)+     ;STORE SWITCH PAC IN MAP
2051  012520  104415                          INPUT
2052  012522  010625                          BM
2053  012524  000000                          0
2054  012526  000377                          377
2055  012530  001304                          $TMP3
2056  012532     000                          .BYTE   0
2057  012533     001                          .BYTE   1
2058  012534  113722  001304                  MOVB    $TMP3,(R2)+     ;STORE SWITCH PAC IN MAP
2059  012540  005722                          TST     (R2)+           ;POP OVER STAT3
2060  012542  005337  001302          33$:    DEC     $TMP2           ;DEC KMC COUNT
2061  012546  001225                          BNE     12$             ;BR IF MORE TO DO
2062  012550  000137  013114                  JMP     13$             ;CONTINUE
2063  012554  012701  160000          7$:     MOV     #160000,R1      ;SET FOR FIRST ADDRESS TO BE TESTED
2064  012560  012737  013206  000004          MOV     #6$,@#4         ;SET FOR NON-EXISTANT DEVICE TIME OUT
2065  012566  005011                  2$:     CLR     (R1)            ;CLEAR SEL0
2066  012570  005711                          TST     (R1)            ;IF KMC11 KMCSR S/B 0
2067  012572  001140                          BNE     3$              ;IF NO DEV ; TRAP TO 4. IF NO BIT 8 THEN NO KMC1
2068  012574  005061  000006                  CLR     6(R1)           ;CLEAR SEL6
2069  012600  005761  000006                  TST     6(R1)           ;IF KMC11 THEN KMRIC S/B =0!
2070  012604  001133                          BNE     3$              ;BR IF NOT KMC11
2071  012606  012711  002000                  MOV     #BIT10,(R1)     ;SET ROMO
2072  012612  005061  000004                  CLR     4(R1)           ;CLEAR SEL4
2073  012616  012761  125252  000006          MOV     #125252,6(R1)   ;WRITE THIS TO SEL6
2074  012624  052711  020000                  BIS     #BIT13,(R1)     ;WRITE IT!
2075  012630  022761  125252  000004          CMP     #125252,4(R1)   ;WAS IT WRITTEN?
2076  012636  001116                          BNE     3$              ;IF NO IT IS NOT CRAM
2077                                  ;AT THIS POINT IT IS ASSUMED THAT R1 HOLDS A KMC11 CSR ADDRESS.
2078  012640                          21$:
2079  012640  010122                  22$:    MOV     R1,(R2)+        ;STORE CSR IN CORE TABLE.
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2080  012642  012711  001000                15$:  MOV   #BIT9,(R1)        ;CLEAR LINE UNIT LOOP
2081  012646  005061  000004                      CLR   4(R1)              ;CLEAR PORT4
2082  012652  012761  122113  000006              MOV   #122113,6(R1)      ;LOAD INSTRUCTION (CLR DTR)
2083  012660  052711  000400                      BIS   #BIT8,(R1)         ;CLOCK INSTRUCTION
2084  012664  012761  021264  000006              MOV   #021264,6(R1)      ;LOAD INSTRUCTION
2085  012672  052711  000400                      BIS   #BIT8,(R1)         ;CLOCK INSTRUCTION
2086  012676  122761  000377  000004              CMPB  #377,4(R1)         ;IS IT ALL ONES?
2087  012704  001003                              BNE   .+10               ;BR IF NO
2088  012706  052712  010000                      BIS   #BIT12,(R2)        ;IF YES, NO LINE UNIT, SET STATUS BIT
2089  012712  000441                              BR    20$
2090  012714  032761  000002  000004              BIT   #BIT1,4(R1)        ;IS SWITCH A ONE?
2091  012722  001406                              BEQ   .+16               ;BR IF M8201
2092  012724  052712  060000                      BIS   #BIT13!BIT14,(R2) ;M8202 ASSUME CONNECTOR
2093  012730  052762  000002  000004              BIS   #BIT1,4(R2)        ;SET BIT1 IN STAT3 FOR HIGH SPEED MICRO-CODE...
2094  012736  000427                              BR    20$                ;CONNECTOR ON)
2095  012740  032761  000010  000004              BIT   #BIT3,4(R1)        ;IS MRDY SET
2096  012746  001023                              BNE   20$                ;BR IF M8201 NO CONNECTOR (ON LINE)
2097  012750  012761  000100  000004              MOV   #BIT6,4(R1)        ;LOAD PORT4
2098  012756  012761  122113  000006              MOV   #122113,6(R1)      ;LOAD INSTRUCTION
2099  012764  052711  000400                      BIS   #BIT8,(R1)         ;CLOCK INSTRUCTION(SET DTR)
2100  012770  012761  021264  000006              MOV   #021264,6(R1)      ;LOAD INSTRUCTION
2101  012776  052711  000400                      BIS   #BIT8,(R1)         ;CLOCK INSTRUCTION(READ MODEM REG)
2102  013002  032761  000010  000004              BIT   #BIT3,4(R1)        ;IS MRDY SET NOW?
2103  013010  001402                              BEQ   20$                ;BR IF NO CONNECTOR
2104  013012  052712  040000                      BIS   #BIT14,(R2)        ;SET STATUS BIT FOR CONNECTOR
2105  013016  005722                      20$:    TST   (R2)+              ;POP POINTER
2106  013020  012761  021324  000006              MOV   #021324,6(R1)      ;PUT INSTRUCTION IN PORT6
2107  013026  012711  001400                      MOV   #BIT9!BIT8,(R1)    ;PORT4_LU 15
2108  013032  156122  000004                      BISB  4(R1),(R2)+        ;STORE DDCMP LINE # IN TABLE
2109  013036  012761  021344  000006              MOV   #021344,6(R1)      ;PORT6_INSTRUCTION
2110  013044  012711  001400                      MOV   #BIT8!BIT9,(R1)    ;CLOCK INSTR.
2111  013050  156122  000004                      BISB  4(R1),(R2)+        ;STORE BM873 ADD IN TABLE
2112  013054  005722                              TST   (R2)+              ;POP OVER STAT3
2113  013056  005011                              CLR   (R1)               ;CLEAR ROMI
2114  013060  005237  001472                      INC   KMNUM              ;UPDATE DEVICE COUNTER
2115  013064  022737  000020  001472              CMP   #20,KMNUM          ;ARE MAX. NO. OF DEV FOUND?
2116  013072  001410                              BEQ   13$                ;YES DON'T LOOK FOR ANY MORE.
2117  013074  005011                      3$:     CLR   (R1)               ;CLEAR BIT 10
2118  013076  005061  000006                      CLR   6(R1)              ;CLEAR SEL 6
2119  013102  062701  000010              14$:    ADD   #10,R1             ;UPDATE CSR POINTER ADDRESS
2120  013106  022701  164000                      CMP   #164000,R1
2121  013112  001225                              BNE   2$                 ;BR IF MORE ADDRESS TO CHECK.
2122  013114  005037  001470              13$:    CLR   KMACTV
2123  013120  005737  001472                      TST   KMNUM              ;WERE ANY KMC11'S FOUND AT ALL?
2124  013124  001423                              BEQ   5$                 ;ERROR AUTO SIZER FOUND NO KMC11'S IN THIS SYS.
2125  013126  013701  001472                      MOV   KMNUM,R1
2126  013132  010137  001476                      MOV   R1,SAVNUM          ;SAVE NUMBER OF DEVICES
2127  013136  000241                      4$:     CLC
2128  013140  006137  001470                      ROL   KMACTV             ;GENERATE ACTIVE REGISTER OF DEVICES.
2129  013144  005237  001470                      INC   KMACTV             ;SET THE BIT
2130  013150  005301                              DEC   R1
2131  013152  001371                              BNE   4$                 ;BR IF MORE TO GENERATE
2132  013154  012737  000006  000004              MOV   #6,@#4             ;RESTORE TRAP VECTOR
2133  013162  013737  001470  001474              MOV   KMACTV,SAVACT      ;SAVE ACTIVE REGISTER
2134  013170  000137  013222                      JMP   VECMAP             ;GO FIND THE VECTOR NOW.
2135  013174  104401  007641              5$:     TYPE  ,MERR2             ;NOTIFY OPR THAT NO KMC11'S FOUND.
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2136  013200  005000                        CLR     R0              ;MAKE DATA LIGHTS ZERO
2137  013202  000000                        HALT                    ;STOP THE SHOW
2138  013204  000776                        BR      .-2             ;DISABLE CONT. SW.
2139  013206  012716  013102          6$:    MOV     #14$,(SP)       ;ENTERED BY NON-EXISTANT TIME-OUT.
2140  013212  000002                        RTI                     ;RETURN TO MAINSTREAM
2141
2142  013214  000001                  WHICH: 1
2143  013216     002     002                .BYTE   2,2
2144  013220  001306                        $TMP4
2145
2146  013222  032737  000001  001446  VECMAP: BIT     #SW00,STRTSW
2147  013230  001114                        BNE     5$
2148  013232  012737  000340  000022        MOV     #340,@#22       ;SET IOT TRAP PRIO TO 7
2149  013240  012737  013414  000020        MOV     #4$,@#20        ;SET IOT TRAP VECTOR
2150  013246  012702  002100                MOV     #KM.MAP,R2      ;SET SOFTWARE POINTER
2151  013252  012700  000300                MOV     #300,R0         ;FLOATING VECTORS START HERE.
2152  013256  012701  000302                MOV     #302,R1         ;PC OF IOT INSTR.
2153  013262  010120                  1$:    MOV     R1,(R0)+        ;START FILLING VECTOR AREA
2154  013264  012721  000004                MOV     #4,(R1)+        ;WITH .+2; IOT
2155  013270  022021                        CMP     (R0)+,(R1)+     ;ADD 2 TO R0 +R1
2156  013272  020127  001000                CMP     R1,#1000
2157  013276  101771                        BLOS    1$              ;BR IF MORE TO FILL
2158  013300  013737  001470  001276        MOV     KMACTV,$TMP0    ;STORE TEMPORALLY
2159  013306  006037  001276          2$:   ROR     $TMP0           ;BRING OUT A BIT
2160  013312  103063                        BCC     5$              ;BR IF ALL DONE
2161  013314  012704  000012                MOV     #12,R4          ;R4 IS INDEX REGISTER
2162  013320  016437  013472  177776        MOV     BRLVL(R4),PS    ;SET PS TO 7
2163  013326  011201                        MOV     (R2),R1
2164  013330  012761  000200  000004        MOV     #200,4(R1)
2165  013336  012711  001000                MOV     #BIT9,(R1)      ;SET ROMI
2166  013342  012761  121111  000006        MOV     #121111,6(R1)   ;PUT INSTRUCTION IN PORT6
2167  013350  012711  001400                MOV     #BIT9!BIT8,(R1) ;FORCE AN INTERRUPT
2168  013354  105200                  7$:   INCB    R0              ;STALL
2169  013356  001376                        BNE     .-2             ;FOR TIME TO INTERUPT
2170  013360  162704  000002                SUB     #2,R4           ;GET NEXT LOWEST PS LEVEL
2171  013364  001404                        BEQ     6$              ;BR IF R4 = 0
2172  013366  016437  013472  177776        MOV     BRLVL(R4),PS    ;MOVE NEXT LOWER LEVEL IN PS
2173  013374  000767                        BR      7$              ;BR TO DELAY
2174  013376  052762  005300  000002  6$:   BIS     #5300,2(R2)     ;NO INTERUPT ASSUME 300 AT LEVEL 5 AND FIX KMC11
2175  013404  005011                  3$:   CLR     (R1)            ;CLEAR ROMI
2176  013406  062702  000010                ADD     #10,R2          ;POP SOFTWARE POINTER
2177  013412  000735                        BR      2$              ;KEEP GOING
2178  013414  051662  000002          4$:   BIS     (SP),2(R2)      ;GET VECTOR ADDRESS
2179  013420  042762  000007  000002        BIC     #7,2(R2)        ;CLEAR JUNK
2180  013426  016405  013474                MOV     BRLVL+2(R4),R5  ;GET BR LEVEL OF KMC11
2181  013432  006305                        ASL     R5              ;SHIFT LEVEL 4 PLACES
2182  013434  006305                        ASL     R5              ;TO THE LEFT FOR THE
2183  013436  006305                        ASL     R5              ;STATUS TABLE
2184  013440  006305                        ASL     R5
2185  013442  042705  170777                BIC     #170777,R5      ;CLEAR UNWANTED BITS
2186  013446  050562  000002                BIS     R5,2(R2)        ;PUT BR LEVEL IN STATUS TABLE
2187  013452  022626                        CMP     (SP)+,(SP)+     ;POP IOT JUNK OFF STACK
2188  013454  012716  013404                MOV     #3$,(SP)        ;SET FOR RETURN
2189  013460  000002                        RTI
2190  013462  012737  004134  000020  5$:   MOV     #$SCOPE,@#20    ; RESTORE SCOPE VECTOR
2191  013470  000207                        RTS     PC              ;ALL DONE WITH ''AUTO SIZING''
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2192
2193  013472  000000                          BRLVL:  PR0     ;LEVEL 0
2194  013474  000000                                  PR0     ;LEVEL 0
2195  013476  000200                                  PR4     ;LEVEL 4
2196  013500  000240                                  PR5     ;LEVEL 5
2197  013502  000300                                  PR6     ;LEVEL 6
2198  013504  000340                                  PR7     ;LEVEL 7
2199
2200
2201  013506  105777  165532                  INTTY:  TSTB    @$TKS           ;WAIT FOR DONE
2202  013512  100375                                  BPL     .-4
2203  013514  017703  165526                          MOV     @$TKB,R3        ;PUT CHAR IN R3
2204  013520  105777  165524                          TSTB    @$TPS           ;WAIT UNTIL PRINTER IS READY
2205  013524  100375                                  BPL     .-4
2206  013526  010377  165520                          MOV     R3,@$TPB        ;ECHO CHAR
2207  013532  042703  000240                          BIC     #BIT7!BIT5,R3   ;MASK OFF LOWER CASE
2208  013536  000207                                  RTS     PC              ;RETURN
2209
2210  013540                                  APT.SIZE:
2211  013540  000005                                  RESET
2212  013542  010046                                  MOV     R0,-(SP)        ;;PUSH R0 ON STACK
2213  013544  010146                                  MOV     R1,-(SP)        ;;PUSH R1 ON STACK
2214  013546  010246                                  MOV     R2,-(SP)        ;;PUSH R2 ON STACK
2215  013550  010346                                  MOV     R3,-(SP)        ;;PUSH R3 ON STACK
2216  013552  005037  013754                          CLR     VECTR           ; CLEAR THE LOCAL VARIABLE
2217  013556  005037  013760                          CLR     PRIRTY          ; CLEAN UP LOCAL VARIABLE
2218  013562  013700  001376                          MOV     $CDW1,R0        ; GET THE DEVICE COUNT
2219  013566  010037  001476                          MOV     R0,SAVNUM       ; SAVE THE NO. OF DEVICES
2220  013572  012701  001346                          MOV     #$MAMS1,R1      ; GET EXTRA INFO, BITS POINTER
2221  013576  013737  001372  013756                  MOV     $BASE,BASE      ; GET BASE CSR ADDRESS
2222  013604  113737  001366  013754                  MOVB    $VECT1,VECTR    ; GET THE VECTOR
2223  013612  113737  001367  013760                  MOVB    $VECT1+1,PRIRTY ; GET THE PRIORITY
2224  013620  013737  001374  001470                  MOV     $DEVM,KMACTV    ; SAVE THE KMC'S SELECTED ACTIVE
2225  013626  013737  001470  001474                  MOV     KMACTV,SAVACT   ; SAVE THE ACTIVE REGISTER
2226  013634  012702  001402                          MOV     #$DDW0,R2       ; GET ADDRESS OF FIRST DEVICE DESCRIPTOR WORD
2227  013640  012703  002100                          MOV     #KM.MAP,R3      ; GET POINTER TO DEVICE MAP
2228  013644  005023                          3$:     CLR     (R3)+           ; CLEAR DEVICE MAP
2229  013646  022703  002300                          CMP     #KM.END,R3      ; IS WHOLE DEV.MAP CLEARED?
2230  013652  003374                                  BGT     3$              ; NO, THEN GO ON.
2231  013654  012703  002100                          MOV     #KM.MAP,R3      ; RESTORE DEV.MAP POINTER.
2232  013660  013723  013756                  1$:     MOV     BASE,(R3)+      ; LOAD CSR ADDRESS
2233  013664  112163  000001                          MOVB    (R1)+,1(R3)     ; GET EXTRA INFO. BITS
2234  013670  006213                                  ASR     (R3)            ; SET IT IN RIGHT POSITION.
2235  013672  006213                                  ASR     (R3)            ; SET IT IN RIGHT POSITION.
2236  013674  053713  013760                          BIS     PRIRTY,(R3)     ; GET PRIORITY IN STAT1
2237  013700  006313                                  ASL     (R3)            ; SET THEM IN RIGHT POSITION
2238  013702  006313                                  ASL     (R3)            ;  ''   ''   ''   ''   ''
2239  013704  006313                                  ASL     (R3)            ;  ''   ''   ''   ''   ''
2240  013706  006313                                  ASL     (R3)            ;  ''   ''   ''   ''   ''
2241  013710  053723  013754                          BIS     VECTR,(R3)+     ; GET THE VECTOR IN STAT1.
2242  013714  012223                                  MOV     (R2)+,(R3)+     ; GET THE STAT2 FROM DDWXX
2243  013716  005723                                  TST     (R3)+           ; SKIP OVER STAT3
2244  013720  005300                                  DEC     R0              ; COUNT BY 1
2245  013722  001407                                  BEQ     2$              ; ALL DONE?
2246  013724  062737  000010  013756                  ADD     #10,BASE        ; INCREMENT BASE CSR ADDRESS BY 10
2247  013732  062737  000010  013754                  ADD     #10,VECTR       ; INCREMENT VECTOR ADDRESS BY 10
```

```
2248  013740  000747                    BR      1$              ; SET THE NEXT MAP ENTRY
2249  013742                      2$:
2250  013742  012603                    MOV     (SP)+,R3        ;;POP STACK INTO R3
2251  013744  012602                    MOV     (SP)+,R2        ;;POP STACK INTO R2
2252  013746  012601                    MOV     (SP)+,R1        ;;POP STACK INTO R1
2253  013750  012600                    MOV     (SP)+,R0        ;;POP STACK INTO R0
2254  013752  000207                    RTS     PC              ; RETURN
2255  013754  000000              VECTR: .WORD   0
2256  013756  000000              BASE:  .WORD   0
2257  013760  000000              PRIRTY: .WORD  0
```

```
2258
2259
2260                                    ;***************************** TEST 1 *****************************
2261                                    ;*FREE RUNNING FLAG MODE DATA TEST
2262                                    ;*TRANSMIT A MESSAGE AND VERIFY THE RECEIVED DATA
2263                                    ;*LINE UNIT LOOP IS SET FOR THIS TEST.
2264                                    ;*ALL FOLLOWING TESTS ARE FREE RUNNING AND ARE PERFORMED
2265                                    ;*ONLY ON KMC'S WITH LINE UNITS. IF YOU WISH TO PERFORM
2266                                    ;*THESE FREE RUNNING TESTS ON A KMC (NORMALLY THE FREE RUNNING TESTS
2267                                    ;*WILL RUN BY LOADING AND STARTING DZKCG
2268                                    ;* WITH SWITCH 7 = 1
2269                                    ;;*************************************************************************
2270
2271                                    ;  TEST 1
2272                                    ;-------------
2273                                ;;*************************************************************************
2274  013762  000004                TST1:   SCOPE
2275  013764  012737  000001  001202        MOV     #1,$TSTNM               ; LOAD THE NO. OF THIS TEST
2276  013772  012737  015006  001442        MOV     #TST2,NEXT              ; POINT TO THE START OF NEXT TEST.
2277                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
2278                                ;       $SKIPT  14$
2279  014000  004737  022474                JSR     PC,LDRVRF       ;FIRST TEST LOAD & VERIFY.
2280  014004  013700  021360                MOV     RCOUNT,R0       ;CLEAR RECEIVER BUFFER
2281  014010  062700  000002                ADD     #2,R0           ;CLEAR 2 MORE LOCATIONS
2282  014014  012702  021362                MOV     #RBUF,R2        ;CLEAR OUT RECEIVE BUFFER
2283  014020  105022                10$:    CLRB    (R2)+           ;CLEAR BUFFER
2284  014022  005300                        DEC     R0              ;DONE YET!
2285  014024  001375                        BNE     10$             ;NO
2286  014026  005037  021306                CLR     TFLAG           ;SET TFLAG TO 0
2287  014032  005037  021310                CLR     RFLAG           ;SET RFLAG TO 0
2288  014036  012711  040000                MOV     #BIT14,(R1)     ;MASTER CLEAR
2289                                ;       BIT     #BIT15,STAT1    ;CRAM?
2290                                ;       BEQ     .+6             ;BR IF NO
2291  014042  012711  100000                MOV     #BIT15,(R1)     ;IF CRAM SET RUN
2292  014046  105227  000000                INCB    #0              ;DELAY
2293  014052  001375                        BNE     .-4             ;DELAY
2294  014054  005037  011122                CLR     TEMP            ;GET SET TO DELAY
2295  014060  005711                1$:     TST     (R1)            ;RUN SET?
2296  014062  100405                        BMI     .+14            ;BR IF YES
2297  014064  005237  011122                INC     TEMP            ;INC DELAY
2298  014070  001373                        BNE     1$              ;BR IF NOT DONE
2299  014072  104014                        ERROR   14              ;ERROR RUN NOT SET
2300  014074  000771                        BR      1$              ;TRY AGAIN
2301  014076  052711  004043                BIS     #4043,(R1)      ;BASEMC I, LU LOOP
2302  014102  005037  011122                CLR     TEMP            ;GET SET TO DELAY
2303  014106  105711                2$:     TSTB    (R1)            ;RDI SET?
2304  014110  100404                        BMI     .+12            ;BR IF YES
2305  014112  005237  011122                INC     TEMP            ;INC DELAY
2306  014116  001373                        BNE     2$              ;BR IF NOT DONE
2307  014120  104014                        ERROR   14              ;ERROR,RDI NOT SET
2308  014122  012761  021430  000004        MOV     #BASEMC,4(R1)   ;SET UP BASEMC ADDRESS
2309  014130  005061  000006                CLR     6(R1)           ;CLEAR COUNT
2310  014134  142711  000040                BICB    #40,(R1)        ;CLEAR RQI
2311  014140  005037  011122                CLR     TEMP            ;GET SET TO DELAY
2312  014144  105711                3$:     TSTB    (R1)            ;IS RDI GONE?
2313  014146  100020                        BPL     8$              ;BR IF YES
```

```
2314  014150  005237  011122                        INC     TEMP            ;INC DELAY
2315  014154  001373                                BNE     3$              ;BR IF NOT DONE
2316  014156  105761  000002                        TSTB    2(R1)           ;IS THERE A CNTL O ERROR
2317  014162  100011                                BPL     18$             ;BR IF NO
2318  014164  016137  000004  001302                MOV     4(R1),$TMP2     ;SAVE SEL4 FOR TYPEOUT
2319  014172  016137  000006  001304                MOV     6(R1),$TMP3     ;SAVE SEL6 FOR TYPEOUT
2320  014200  104016                                ERROR   16              ;CNTL O ERROR
2321  014202  000137  015006                        JMP     14$             ;FATAL ERROR STOP
2322  014206  104014                        18$:    ERROR   14              ;ERROR RDI STILL SET
2323  014210                                8$:
2324  014210  152711  000041                        BISB    #41,(R1)        ;ASK FOR CNTL I
2325  014214  105711                        64$:    TSTB    (R1)            ;WAIT FOR RDI
2326  014216  100376                                BPL     64$             ;BR IF NOT SETY
2327  014220  005061  000006                        CLR     6(R1)           ;SET FULL DUPLEX
2328  014224  142711  000040                        BICB    #40,(R1)        ;CLEAR RQI
2329  014230  105711                        65$:    TSTB    (R1)            ;RDI UP?
2330  014232  100776                                BMI     65$             ;BR IF YES
2331  014234  152711  000044                        BISB    #44,(R1)        ;REC BA/CC
2332  014240  005037  011122                        CLR     TEMP            ;GET SET TO DELAY
2333  014244  105711                        4$:     TSTB    (R1)            ;IS RDI SET?
2334  014246  100404                                BMI     .+12            ;BR IF YES
2335  014250  005237  011122                        INC     TEMP            ;INC DELAY
2336  014254  001373                                BNE     4$              ;BR IF DELAY NOT DONE
2337  014256  104014                                ERROR   14              ;ERROR RDI NOT SET
2338  014260  012761  021362  000004                MOV     #RBUF,4(R1)     ;LOAD REC BA
2339  014266  013761  021360  000006                MOV     RCOUNT,6(R1)    ;LOAD REC COUNT
2340  014274  142711  000040                        BICB    #40,(R1)        ;CLEAR RQI
2341  014300  005037  011122                        CLR     TEMP            ;GET SET TO DELAY
2342  014304  105711                        5$:     TSTB    (R1)            ;RDI GONE?
2343  014306  100004                                BPL     .+12            ;BR IF YES
2344  014310  005237  011122                        INC     TEMP            ;INC DELAY
2345  014314  001373                                BNE     5$              ;BR IF NO DONE
2346  014316  104014                                ERROR   14              ;ERROR RDI STILL SET
2347  014320  152711  000040                        BISB    #40,(R1)        ;XMIT BA/CC
2348  014324  005037  011122                        CLR     TEMP            ;GET SET TO DELAY
2349  014330  105711                        6$:     TSTB    (R1)            ;RDI SET?
2350  014332  100404                                BMI     .+12            ;BR IF YES
2351  014334  005237  011122                        INC     TEMP            ;INC DELAY
2352  014340  001373                                BNE     6$              ;BR IF NOT DONE
2353  014342  104014                                ERROR   14              ;ERROR RDI NOT SET
2354  014344  012761  021314  000004                MOV     #TBUF,4(R1)     ;LOAD XMIT BUFFER
2355  014352  013761  021312  000006                MOV     TCOUNT,6(R1)    ;LOAD COUNT
2356  014360  142711  000040                        BICB    #40,(R1)        ;CLEAR RQI
2357  014364  005037  011122                        CLR     TEMP            ;GET SET TO DELAY
2358  014370  105711                        7$:     TSTB    (R1)            ;RDI GONE?
2359  014372  100004                                BPL     .+12            ;BR IF YES
2360  014374  005237  011122                        INC     TEMP            ;INC DELAY
2361  014400  001373                                BNE     7$              ;BR IF NOT DONE DELAY
2362  014402  104014                                ERROR   14              ;ERROR RDI STILL SET
2363  014404  005037  011122                16$:    CLR     TEMP            ;GET SET TO DELAY
2364  014410  012737  000022  001276                MOV     #22,$TMP0       ;GET SET FOR LONG DELAY
2365  014416  105761  000002                11$:    TSTB    2(R1)           ;RDO SET?
2366  014422  100407                                BMI     17$             ;BR IF YES
2367  014424  005237  011122                        INC     TEMP            ;INC DELAY
2368  014430  001372                                BNE     11$             ;BR IF DELAY NOT DONE
2369  014432  005337  001276                        DEC     $TMP0           ;DEC DELAY COUNT
```

```
2370  014436  001367                          BNE     11$             ;BR IF NOT DONE DELAY
2371  014440  104014                          ERROR   14              ;ERROR RDO NOT SET
2372  014442  016137  000002  001300  17$:    MOV     2(R1),$TMP1     ;SAVE SEL2
2373  014450  001001                          BNE     .+4             ;BR IF OK
2374  014452  104014                          ERROR   14              ;ERROR!!! SEL2 - 0..!..
2375  014454  032761  000004  000002          BIT     #BIT2,2(R1)     ;REC OR XMIT?
2376  014462  001032                          BNE     13$             ;BR IF REC
2377  014464  005737  021306          12$:    TST     TFLAG           ;FIRST TIME HERE?
2378  014470  001401                          BEQ     .+4             ;BR IF YES
2379  014472  104014                          ERROR   14              ;ERROR MULTIPLE XMIT DONES
2380  014474  012737  177777  021306          MOV     #-1,TFLAG       ;SET TFLAG TO -1
2381  014502  132761  000001  000002          BITB    #BIT0,2(R1)     ;IS IT CONTROL 0
2382  014510  001401                          BEQ     .+4             ;BR IF NO
2383  014512  104014                          ERROR   14              ;XMIT ERROR
2384  014514  022761  021314  000004          CMP     #TBUF,4(R1)     ;XMIT BA CORRECT?
2385  014522  001401                          BEQ     .+4             ;BR IF YES
2386  014524  104014                          ERROR   14              ;XMIT BA ERROR
2387  014526  023761  021312  000006          CMP     TCOUNT,6(R1)    ;COUNT OK?
2388  014534  001401                          BEQ     .+4             ;BR IF YES
2389  014536  104014                          ERROR   14              ;XMIT COUNT ERROR
2390  014540  142761  000207  000002          BICB    #207,2(R1)      ;CLEAR RDO AND BITS 0-2
2391  014546  000453                          BR      15$             ;CONTINUE
2392  014550  005737  021310          13$:    TST     RFLAG           ;FIRST TIME HERE?
2393  014554  001401                          BEQ     .+4             ;BR IF YES
2394  014556  104014                          ERROR   14              ;ERROR MULTIPLE REC DONES
2395  014560  012737  177777  021310          MOV     #-1,RFLAG       ;SET RFLAG TO -1
2396  014566  132761  000001  000002          BITB    #BIT0,2(R1)     ;IS IT CNTL 0
2397  014574  001401                          BEQ     .+4             ;BR IF NO
2398  014576  104014                          ERROR   14              ;RECEIVE ERROR
2399  014600  022761  021362  000004          CMP     #RBUF,4(R1)     ;REC BA CORRECT?
2400  014606  001401                          BEQ     .+4             ;BR IF YES
2401  014610  104014                          ERROR   14              ;REC BA ERROR
2402  014612  023761  021360  000006          CMP     RCOUNT,6(R1)    ;COUNT OK?
2403  014620  001401                          BEQ     .+4             ;BR IF YES
2404  014622  104014                          ERROR   14              ;REC COUNT ERROR
2405  014624  013700  021360                  MOV     RCOUNT,R0       ;GET SET TO CHECK DATA
2406  014630  012702  021314                  MOV     #TBUF,R2        ;R2 POINTS TO GOOD DATA
2407  014634  012703  021362                  MOV     #RBUF,R3        ;R3 POINTS TO RECEIVE DATA
2408  014640  010337  001302          9$:     MOV     R3,$TMP2        ;SAVE ADDRESS FOR TYPEOUT
2409  014644  112205                          MOVB    (R2)+,R5        ;R5 = XMIT DATA
2410  014646  112304                          MOVB    (R3)+,R4        ;R4 = RECFIVE DATA
2411  014650  120504                          CMPB    R5,R4           ;CHECK DATA
2412  014652  001401                          BEQ     .+4             ;BR IF OK
2413  014654  104013                          ERROR   13              ;DATA ERROR
2414  014656  005300                          DEC     R0              ;DEC COUNT
2415  014660  001367                          BNE     9$              ;BR IF NOT DONE
2416  014662  005713                          TST     (R3)            ;THIS SHOULD BE 0, ELSE
2417  014664  001401                          BEQ     .+4             ;IT RECEIVED TO MUCH!!
2418  014666  104014                          ERROR   14              ;ERROR
2419  014670  142761  000207  000002          BICB    #207,2(R1)      ;CLEAR RDO AND BITS 0-2
2420  014676  005737  021310          15$:    TST     RFLAG           ;REC DONE?
2421  014702  001640                          BEQ     16$             ;BR IF NO
2422  014704  005737  021306                  TST     TFLAG           ;XMIT DONE?
2423  014710  001635                          BEQ     16$             ;BR IF NO
2424  014712  004737  022442                  JSR     PC,SHUTDOWN     ;SHUTDOWN KMC
2425  014716  012700  014744                  MOV     #25$,R0         ;POINTER TO EXPECTED SOFT COUNTS
```

```
2426  014722  012701  021433          21$:    MOV     #BASEMC+3,R1    ;POINTER TO ACTUAL COUNTS
2427  014726  012702  000010                  MOV     #10,R2          ;COUNT
2428  014732  122021                  22$:    CMPB    (R0)+,(R1)+     ;COMPARE SOFT ERROR COUNTS
2429  014734  001007                          BNE     23$             ;IF ERROR BR 23$
2430  014736  005302                          DEC     R2              ;DEC COUNT
2431  014740  001374                          BNE     22$             ;CONTINUE CHECKING IF NOT DONE
2432  014742  000421                          BR      24$             ;ALL COUNTS OK, GET OUT
2433  014744     000     000     000  25$:    .BYTE   0,0,0,0,0,0,0,0 ;EXPECTED ERROR COUNTS
2434  014747     000     000     000
2435  014752     000     000
2436  014754  113737  021433  001300  23$:    MOVB    BASEMC+3,$TMP1
2437  014762  113737  021435  001302          MOVB    BASEMC+5,$TMP2
2438  014770  113737  021437  001304          MOVB    BASEMC+7,$TMP3
2439  014776  113737  021441  001306          MOVB    BASEMC+11,$TMP4
2440  015004  104017                          ERROR   17
2441  015006                          24$:
2442  015006                          14$:    ;SCOPE                  ;SCOPE THIS TEST
2443
2444
2445                                          ;*************************** TEST 2 ***************************
2446                                          ;*OVERUN TEST
2447                                          ;*IN FREE RUNNING MODE SEND MESSAGE WITH NO RECEIVE
2448                                          ;*BUFFER AVAILABLE, VERIFY THAT AN OVERRUN ERROR OCCURS
2449                                          ;*************************************************************************
2450
2451                                          ;  TEST 2
2452                                          ;-------------
2453                                  ;;*************************************************************************
2454  015006  000004                  TST2:   SCOPE
2455  015010  012737  000002  001202          MOV     #2,$TSTNM               ; LOAD THE NO. OF THIS TEST
2456  015016  012737  015200  001442          MOV     #TST3,NEXT              ; POINT TO THE START OF NEXT TEST.
2457                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
2458                                  ;       $SKIPT  10$
2459  015024  004737  022030                  JSR     PC,BASELD               ;LOAD KMC BASEMC ADDRESS
2460  015030  004537  022410                  JSR     R5,XFRELD       ;LOAD XMIT BA/CC
2461  015034  021314                          TBUF                    ;BA
2462  015036  000044                          44                      ;CC
2463  015040  012700  000010                  MOV     #10,R0          ;R0 = RETRANSMISSION COUNT
2464  015044  012703  000015                  MOV     #15,R3          ;DELAY COUNT
2465  015050  005037  011122                  CLR     TEMP            ;CLEAR DELAY COUNTER
2466  015054  105761  000002          1$:     TSTB    2(R1)           ;IS RDY 0 SET?
2467  015060  100407                          BMI     .+20            ;BR IF SET
2468  015062  005237  011122                  INC     TEMP            ;INC DELAY COUNTER
2469  015066  001372                          BNE     1$              ;BR IF NOT DONE DELAY
2470  015070  005303                          DEC     R3              ;DEC DELAY COUNT
2471  015072  001370                          BNE     1$              ;BR IF DELAY NOT DONE
2472  015074  104014                          ERROR   14              ;ERROR, RDY 0 NOT SET
2473  015076  000431                          BR      10$             ;GET OUT
2474  015100  132761  000001  000002          BITB    #BIT0,2(R1)     ;IS IT CNTL 0?
2475  015106  001002                          BNE     11$             ;BR IF YES
2476  015110  104014                          ERROR   14              ;ERROR, NOT CNTL 0
2477  015112  000423                          BR      10$             ;CONTINUE
2478  015114  012705  000004          11$:    MOV     #BIT2,R5        ;PUT 'EXPECTED'' IN R5
2479  015120  016104  000006                  MOV     6(R1),R4        ;PUT 'FOUND'' IN R4
2480  015124  020504                          CMP     R5,R4           ;IS ORUN SET?
2481  015126  001404                          BEQ     12$             ;BR IF YES
```

```
2482  015130  022704  000001                        CMP     #1,R4           ;DATA CK ERROR?
2483  015134  001413                                BEQ     13$             ;BR IF YES
2484  015136  104015                                ERROR   15              ;ERROR, ORUN NOT SET
2485  015140  042761  000207  000002          12$:  BIC     #207,2(R1)      ;CLEAR RDO
2486  015146  005037  011122                        CLR     TEMP            ;RESET DELAY
2487  015152  005300                                DEC     R0              ;DEC RETRANS COUNT
2488  015154  001337                                BNE     1$              ;COUNTINUE
2489  015156  004737  022442                        JSR     PC,SHUTDOWN     ;SHUTDOWN KMC
2490  015162  104420                          10$:  ADVANCE                 ;SCOPE THIS TEST
2491  015164  042761  000207  000002          13$:  BIC     #207,2(R1)      ;IGNOR THIS ERROR
2492  015172  005037  011122                        CLR     TEMP            ;RESET DELAY
2493  015176  000726                                BR      1$              ;CONTINUE
2494
2495
2496                                                ;***************************** TEST 3 *****************************
2497                                                ;*LOST DATA TEST
2498                                                ;*IN FREE RUNNING MODE SEND A MESSAGE LONGER THAN THE RECEIVE
2499                                                ;*BUFFER, VERIFY THAT A LOST DATA ERROR OCCURS.
2500                                                ;;*************************************************************************
2501
2502                                                ;  TEST 3
2503                                                ;-------------
2504                                          ;;*************************************************************************
2505  015200  000004                          TST3:  SCOPE
2506  015202  012737  000003  001202                 MOV     #3,$TSTNM               ; LOAD THE NO. OF THIS TEST
2507  015210  012737  015336  001442                 MOV     #TST4,NEXT              ; POINT TO THE START OF NEXT TEST.
2508                                                ;R1 CONTAINS BASE KMC11 ADDRESS
2509  015216  104410                                MSTCLR                  ;MASTER CLEAR KMC11
2510                                            ;   $SKIPT   10$
2511  015220  004737  022030                        JSR     PC,BASELD               ;LOAD KMC BASEMC ADDRESS
2512  015224  004537  022356                        JSR     R5,RFRELD       ;LOAD RECEIVE BA/CC
2513  015230  021362                                RBUF                    ;BA
2514  015232  000020                                20                      ;CC
2515  015234  004537  022410                        JSR     R5,XFRELD       ;LOAD XMIT BA/CC
2516  015240  021314                                TBUF                    ;BA
2517  015242  000044                                44                      ;CC
2518  015244  012703  000015                        MOV     #15,R3          ;DELAY COUNT
2519  015250  005037  011122                        CLR     TEMP            ;CLEAR DELAY COUNTER
2520  015254  105761  000002                  1$:   TSTB    2(R1)           ;IS RDY 0 SET?
2521  015260  100407                                BMI     .+20            ;BR IF SET
2522  015262  005237  011122                        INC     TEMP            ;INC DELAY COUNTER
2523  015266  001372                                BNE     1$              ;BR IF NOT DONE DELAY
2524  015270  005303                                DEC     R3              ;DEC DELAY COUNT
2525  015272  001370                                BNE     1$              ;BR IF DELAY NOT DONE
2526  015274  104014                                ERROR   14              ;ERROR, RDY 0 NOT SET
2527  015276  000417                                BR      10$             ;GET OUT
2528  015300  132761  000001  000002                BITB    #BIT0,2(R1)     ;IS IT CNTL 0?
2529  015306  001002                                BNE     11$             ;BR IF YES
2530  015310  104014                                ERROR   14              ;ERROR NOT CNTL 0
2531  015312  000411                                BR      10$             ;CONTINUE
2532  015314  012705  000020                  11$:  MOV     #BIT4,R5        ;PUT 'EXPECTED' IN R5
2533  015320  016104  000006                        MOV     6(R1),R4        ;PUT 'FOUND' IN R4
2534  015324  020504                                CMP     R5,R4           ;IS LOST DATA SET?
2535  015326  001401                                BEQ     12$             ;BR IF YES
2536  015330  104015                                ERROR   15              ;ERROR, LOST DATA NOT SET
2537  015332  004737  022442                  12$:  JSR     PC,SHUTDOWN     ;SHUTDOWN KMC
```

```
2538  015336                                    10$:    ;SCOPE                  ;SCOPE THIS TEST
2539
2540
2541                                                    ;*************************** TEST 4 ****************************
2542                                                    ;*TRANSMIT NON-EXISTENT MEMORY TEST
2543                                                    ;*IN FREE RUNNING MODE, LOAD A TRANSMIT BA THAT WILL TIME OUT
2544                                                    ;*VERIFY THAT A NON-EXISTENT MEMORY ERROR OCCURS
2545                                                    ;;***************************************************************
2546
2547                                                    ;  TEST 4
2548                                                    ;-------------
2549                                                ;;***************************************************************
2550  015336  000004                            TST4:   SCOPE
2551  015340  012737  000004  001202                    MOV     #4,$TSTNM               ; LOAD THE NO. OF THIS TEST
2552  015346  012737  015464  001442                    MOV     #TST5,NEXT              ; POINT TO THE START OF NEXT TEST.
2553                                                                                ;R1 CONTAINS BASE KMC11 ADDRESS
2554  015354  104410                                    MSTCLR                      ;MASTER CLEAR KMC11
2555                                            ;       $SKIPT  10$
2556  015356  004737  022030                            JSR     PC,BASELD               ;LOAD KMC BASEMC ADDRESS
2557  015362  004537  022410                            JSR     R5,XFRELD           ;LOAD XMIT BA/CC
2558  015366  177320                                    177320                      ;BA
2559  015370  140044                                    140044                      ;CC
2560  015372  012703  000015                            MOV     #15,R3              ;DELAY COUNT
2561  015376  005037  011122                            CLR     TEMP                ;CLEAR DELAY COUNTER
2562  015402  105761  000002                    1$:     TSTB    2(R1)               ;IS RDY 0 SET?
2563  015406  100407                                    BMI     .+20                ;BR IF SET
2564  015410  005237  011122                            INC     TEMP                ;INC DELAY COUNTER
2565  015414  001372                                    BNE     1$                  ;BR IF NOT DONE DELAY
2566  015416  005303                                    DEC     R3                  ;DEC DELAY COUNT
2567  015420  001370                                    BNE     1$                  ;BR IF DELAY NOT DONE
2568  015422  104014                                    ERROR   14                  ;ERROR, RDY 0 NOT SET
2569  015424  000417                                    BR      10$                 ;GET OUT
2570  015426  132761  000001  000002                    BITB    #BIT0,2(R1)         ;IS IT CNTL 0?
2571  015434  001002                                    BNE     11$                 ;BR IF YES
2572  015436  104014                                    ERROR   14                  ;ERROR, NOT CNTL 0
2573  015440  000411                                    BR      10$                 ;CONTINUE
2574  015442  012705  000400                    11$:    MOV     #BIT8,R5            ;PUT 'EXPECTED'' IN R5
2575  015446  016104  000006                            MOV     6(R1),R4            ;PUT 'FOUND'' IN R4
2576  015452  020504                                    CMP     R5,R4               ;IS NON-EX-MEM SET?
2577  015454  001401                                    BEQ     .+4                 ;BR IF YES
2578  015456  104015                                    ERROR   15                  ;ERROR NON-EX-MEM NOT SET
2579  015460  004737  022442                            JSR     PC,SHUTDOWN         ;SHUTDOWN KMC
2580  015464                                    10$:    ;SCOPE                      ;SCOPE THIS TEST
2581
2582
2583                                                    ;*************************** TEST 5 ****************************
2584                                                    ;*RECEIVE NON-EXISTENT MEMORY TEST
2585                                                    ;*IN FREE RUNNING MODE, LOAD A RECEIVE BA THAT WILL TIME OUT
2586                                                    ;*VERIFY THAT A NON-EXISTENT MEMORY ERROR OCCURS
2587                                                    ;;***************************************************************
2588
2589                                                    ;  TEST 5
2590                                                    ;-------------
2591                                                ;;***************************************************************
2592  015464  000004                            TST5:   SCOPE
2593  015466  012737  000005  001202                    MOV     #5,$TSTNM               ; LOAD THE NO. OF THIS TEST
```

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2594  015474  012737  015622  001442                  MOV     #TST6,NEXT              ; POINT TO THE START OF NEXT TEST.
2595                                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
2596  015502  104410                                   MSTCLR                          ;MASTER CLEAR KMC11
2597                                            ;      $SKIPT  10$
2598  015504  004737  022030                           JSR     PC,BASELD               ;LOAD KMC BASEMC ADDRESS
2599  015510  004537  022356                           JSR     R5,RFRELD               ;LOAD RECEIVE BA/CC
2600  015514  177320                                   177320                          ;BA
2601  015516  140044                                   140044                          ;CC
2602  015520  004537  022410                           JSR     R5,XFRELD               ;LOAD XMIT BA/CC
2603  015524  021314                                   TBUF                            ;BA
2604  015526  000044                                   44                              ;CC
2605  015530  012703  000015                           MOV     #15,R3                  ;DELAY COUNT
2606  015534  005037  011122                           CLR     TEMP                    ;CLEAR DELAY COUNTER
2607  015540  105761  000002                    1$:    TSTB    2(R1)                   ;IS RDY 0 SET?
2608  015544  100407                                   BMI     .+20                    ;BR IF SET
2609  015546  005237  011122                           INC     TEMP                    ;INC DELAY COUNTER
2610  015552  001372                                   BNE     1$                      ;BR IF NOT DONE DELAY
2611  015554  005303                                   DEC     R3                      ;DEC DELAY COUNT
2612  015556  001370                                   BNE     1$                      ;BR IF DELAY NOT DONE
2613  015560  104014                                   ERROR   14                      ;ERROR, RDY 0 NOT SET
2614  015562  000417                                   BR      10$                     ;GET OUT
2615  015564  132761  000001  000002                   BITB    #BIT0,2(R1)             ;IS IT CNTL 0?
2616  015572  001002                                   BNE     11$                     ;BR IF YES
2617  015574  104014                                   ERROR   14                      ;ERROR, NOT CNTL 0
2618  015576  000411                                   BR      10$                     ;CONTINUE
2619  015600  012705  000400                    11$:   MOV     #BIT8,R5                ;PUT 'EXPECTED'' IN R5
2620  015604  016104  000006                           MOV     6(R1),R4                ;PUT 'FOUND'' IN R4
2621  015610  020504                                   CMP     R5,R4                   ;IS NON-EX-MEM SET?
2622  015612  001401                                   BEQ     .+4                     ;BR IF YES
2623  015614  104015                                   ERROR   15                      ;ERROR NON-EX-MEM NOT SET
2624  015616  004737  022442                           JSR     PC,SHUTDOWN             ;SHUTDOWN KMC
2625  015622                                    10$:   ;SCOPE                          ;SCOPE THIS TEST
2626
2627
2628                                                   ;*************************** TEST 6 ****************************
2629                                                   ;*PROCESSOR ERROR TEST
2630                                                   ;*IN FREE RUNNING MODE, DO A BASEMC TRANSFER REQUEST AFTER A
2631                                                   ;*BASEMC HAS BEEN SET UP, VERIFY THAT A PROCESSOR ERROR OCCURS.
2632                                                   ;;*************************************************************
2633
2634                                                   ;  TEST 6
2635                                                   ;-------------
2636                                                   ;;*************************************************************
2637  015622  000004                            TST6:  SCOPE
2638  015624  012737  000006  001202                   MOV     #6,$TSTNM               ; LOAD THE NO. OF THIS TEST
2639  015632  012737  015740  001442                   MOV     #TST7,NEXT              ; POINT TO THE START OF NEXT TEST.
2640                                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
2641  015640  104410                                   MSTCLR                          ;MASTER CLEAR KMC11
2642                                            ;      $SKIPT  10$
2643  015642  004737  022030                           JSR     PC,BASELD               ;LOAD BASEMC ADDRESS
2644  015646  152711  000043                    12$:   BISB    #43,(R1)                ;2ND BASEMC REQUEST
2645  015652  105711                                   TSTB    (R1)                    ;RDI SET?
2646  015654  100376                                   BPL     .-2                     ;BR IF NO
2647  015656  142711  000040                           BICB    #40,(R1)                ;CLEAR RQI
2648  015662  005037  011122                           CLR     TEMP                    ;GET SET TO DELAY
2649  015666  105761  000002                    13$:   TSTB    2(R1)                   ;RDO SET?
```

```
2650  015672  100405                          BMI     14$             ;BR IF YES
2651  015674  005237  011122                  INC     TEMP            ;INC DELAY
2652  015700  001372                          BNE     13$             ;BR IF NOT DONE DELAY
2653  015702  104014                          ERROR   14              ;ERROR, RDO NOT SET
2654  015704  000770                          BR      13$             ;TRY AGAIN
2655  015706  132761  000001  000002  14$:    BITB    #BIT0,2(R1)     ;IS IS CNTL O?
2656  015714  001002                          BNE     11$             ;BR IF YES
2657  015716  104014                          ERROR   14              ;ERROR NOT CNTL O
2658  015720  000407                          BR      10$             ;CONTINUE
2659  015722  012705  001000          11$:    MOV     #BIT9,R5        ;PUT 'EXPECTED' IN R5
2660  015726  016104  000006                  MOV     6(R1),R4        ;PUT 'FOUND' IN R4
2661  015732  020504                          CMP     R5,R4           ;IS PROC ERROR SET?
2662  015734  001401                          BEQ     .+4             ;BR IF YES
2663  015736  104015                          ERROR   15              ;ERROR, PROC ERROR NOT SET
2664  015740                          10$:    ;SCOPE                  ;SCOPE THIS TEST
2665
2666
2667                                          ;***************************** TEST 7 *****************************
2668                                          ;*PROCESSOR ERROR TEST
2669                                          ;*IN FREE RUNNING MODE DO A RQI WITH AN ILLEGAL 10 CODE
2670                                          ;*VERIFY THAT A PROCESSOR ERROR OCCURS
2671                                          ;;*************************************************************************
2672
2673                                          ;  TEST 7
2674                                          ;-------------
2675                                  ;;******************************************************************
2676  015740  000004                  TST7:   SCOPE
2677  015742  012737  000007  001202          MOV     #7,$TSTNM               ; LOAD THE NO. OF THIS TEST
2678  015750  012737  016056  001442          MOV     #TST10,NEXT             ; POINT TO THE START OF NEXT TEST.
2679                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
2680  015756  104410                          MSTCLR                  ;MASTER CLEAR KMC11
2681                                  ;       $SKIPT  10$
2682  015760  004737  022030                  JSR     PC,BASELD               ;LOAD KMC BASEMC ADDRESS
2683  015764  152711  000046                  BISB    #46,(R1)        ;RQI AND ILLEGAL CODE
2684  015770  105711                          TSTB    (R1)            ;WAIT FOR RDI
2685  015772  100376                          BPL     .-2             ;BR IF NO RDI
2686  015774  142711  000040                  BICB    #40,(R1)        ;CLEAR RQI
2687  016000  005037  011122                  CLR     TEMP            ;CLEAR COUNTER
2688  016004  105761  000002          1$:     TSTB    2(R1)           ;RDY O SET?
2689  016010  100405                          BMI     .+14            ;BR IF YES
2690  016012  005237  011122                  INC     TEMP            ;BUMP COUNTER DELAY
2691  016016  001372                          BNE     1$              ;BR IF NOT DONE
2692  016020  104014                          ERROR   14              ;ERROR NO RDY O
2693  016022  000770                          BR      1$              ;TRY AGAIN
2694  016024  132761  000001  000002          BITB    #BIT0,2(R1)     ;IS IT CNTL O
2695  016032  001002                          BNE     11$             ;BR IF YES
2696  016034  104014                          ERROR   14              ;ERROR, NOT CNTL O
2697  016036  000407                          BR      10$             ;CONTINUE
2698  016040  012705  001000          11$:    MOV     #BIT9,R5        ;PUT 'EXPECTED' IN R5
2699  016044  016104  000006                  MOV     6(R1),R4        ;PUT 'FOUND' IN R4
2700  016050  020504                          CMP     R5,R4           ;IS PROC ERROR SET?
2701  016052  001401                          BEQ     .+4             ;BR IF YES
2702  016054  104015                          ERROR   15              ;ERROR PROC ERROR NOT SET
2703  016056                          10$:    ;SCOPE                  ;SCOPE THIS TEST
2704
2705
```

```
                                        ;*************************** TEST 10 ****************************
                                        ;*HALF DUPLEX TEST
                                        ;*IN FREE RUNNING MODE, SET HALF DUPLEX AND L U LOOP
                                        ;*SEND A MESSAGE AND VERIFY THAT THERE ARE NO DONES
                                        ;:****************************************************************

                                        ;  TEST 10
                                        ;-------------
                                    ;;*****************************************************************
016056  000004                      TST10:  SCOPE
016060  012737  000010  001202              MOV     #10,$TSTNM              ; LOAD THE NO. OF THIS TEST
016066  012737  016156  001442              MOV     #TST11,NEXT             ; POINT TO THE START OF NEXT TEST.
                                                                    ;R1 CONTAINS BASE KMC11 ADDRESS
016074  104410                              MSTCLR                  ;MASTER CLEAR KMC11
                                    ;       $SKIPT  10$
016076  004737  022136                      JSR     PC,BASELH       ;LOAD BASEMC AND HALF DUPLEX
016102  004537  022356                      JSR     R5,RFRELD       ;LOAD RECEIVE BUFFER
016106  021362                              RBUF                    ;BA
016110  000044                              44                      ;CC
016112  004537  022410                      JSR     R5,XFRELD       ;LOAD TRANSMIT BUFFER
016116  021314                              TBUF                    ;BA
016120  000044                              44                      ;CC
016122  012703  000003                      MOV     #3,R3           ;LOAD DELAY COUNT
016126  005037  011122                      CLR     TEMP            ;CLEAR DELAY
016132  105761  000002              4$:     TSTB    2(R1)           ;IS DONE SET?
016136  100406                              BMI     5$              ;BR IF YES (ERROR)
016140  005237  011122                      INC     TEMP            ;INC DELAY
016144  001372                              BNE     4$              ;BR IF DELAY NOT DONE
016146  005303                              DEC     R3              ;DEC DELAY COUNT
016150  001370                              BNE     4$              ;BR IF DELAY NOT DONE
016152  000401                              BR      10$
016154  104014                      5$:     ERROR   14              ;ERROR DONE WITH HALF-DUPLEX
016156                              10$:


                                        ;*************************** TEST 11 ****************************
                                        ;*RESUME TEST
                                        ;*THIS TEST SENDS AND RECEIVES A BUFFER AND SHUTS DOWN THE
                                        ;*KMC. THEN A MASTER CLEAR IS ISSUED AND A BASEMC WITH RESUME
                                        ;*BIT SET IS GIVEN, ANOTHER BUFFER IS SENT AND RECEIVED.
                                        ;*DATA IS CHECKED.
                                        ;:****************************************************************

                                        ;  TEST 11
                                        ;-------------
                                    ;;*****************************************************************
016156  000004                      TST11:  SCOPE
016160  012737  000011  001202              MOV     #11,$TSTNM              ; LOAD THE NO. OF THIS TEST
016166  012737  016370  001442              MOV     #TST12,NEXT             ; POINT TO THE START OF NEXT TEST.
                                                                    ;R1 CONTAINS BASE KMC11 ADDRESS
016174  104410                              MSTCLR                  ;MASTER CLEAR KMC11
                                    ;$SKIPT 10$
016176  005037  020050                      CLR     RESUME          ;CLR RESUME FLAG
016202  005737  020050              1$:     TST     RESUME          ;FIRST OR SECOND PASS?
016206  001003                              BNE     2$              ;BR IF SECOND
016210  004737  022030                      JSR     PC,BASELD       ;BASEMC
```

```
2762  016214  000402                          BR      3$              ;CONTINUE
2763  016216  004737  022246          2$:     JSR     PC,RESUM        ;BASEMC WITH RESUME BIT
2764  016222  004537  022356          3$:     JSR     R5,RFRELD       ;RECEIVE BUFFER
2765  016226  021362                          RBUF                    ;BA
2766  016230  000044                          44                      ;CC
2767  016232  004537  022410                  JSR     R5,XFRELD       ;XMIT BUFFER
2768  016236  021314                          TBUF                    ;BA
2769  016240  000044                          44                      ;CC
2770  016242  012703  000030                  MOV     #30,R3          ;DELAY COUNT
2771  016246  012700  000002                  MOV     #2,R0           ;NEED TWO DONES
2772  016252  005037  011122                  CLR     TEMP            ;CLEAR DELAY COUNTER
2773  016256  105761  000002          4$:     TSTB    2(R1)           ;IS RDY 0 SET?
2774  016262  100407                          BMI     .+20            ;BR IF SET
2775  016264  005237  011122                  INC     TEMP            ;INC DELAY COUNTER
2776  016270  001372                          BNE     4$              ;BR IF NOT DONE DELAY
2777  016272  005303                          DEC     R3              ;DEC DELAY COUNT
2778  016274  001370                          BNE     4$              ;BR IF DELAY NOT DONE
2779  016276  104014                          ERROR   14              ;ERROR, RDY 0 NOT SET
2780  016300  000433                          BR      10$             ;GET OUT
2781  016302  042761  000207  000002          BIC     #207,2(R1)      ;CLEAR DONE
2782  016310  005300                          DEC     R0              ;TWO DONES YET?
2783  016312  001361                          BNE     4$              ;BR IF NOT
2784  016314  012702  021314                  MOV     #TBUF,R2        ;ADDRESS OF GOOD DATA
2785  016320  012703  021362                  MOV     #RBUF,R3        ;ADDRESS OF RECEIVED DATA
2786  016324  012700  000044                  MOV     #44,R0          ;COUNT
2787  016330  112205                  6$:     MOVB    (R2)+,R5        ;LOAD GOOD DATA
2788  016332  112304                          MOVB    (R3)+,R4        ;LOAD FOUND DATA
2789  016334  120504                          CMPB    R5,R4           ;COMPARE DATA
2790  016336  001401                          BEQ     7$              ;BR IF OK
2791  016340  104012                          ERROR   12              ;DATA ERROR
2792  016342  005300                  7$:     DEC     R0              ;DONE YET?
2793  016344  001371                          BNE     6$              ;BR IF NOT
2794  016346  004737  022442                  JSR     PC,SHUTDOWN     ;SHUTDOWN KMC
2795  016352  005737  020050                  TST     RESUME          ;
2796  016356  001004                          BNE     8$              ;BR IF ALL DONE
2797  016360  012737  177777  020050          MOV     #-1,RESUME      ;SET FLAG FOR SECOND PASS
2798  016366  000705                          BR      1$              ;CONTINUE
2799  016370                          8$:
2800  016370                          10$:    ;SCOPE                  ;SCOPE THIS TEST
2801
2802
2803                                          ;***************************** TEST 12 ****************************
2804                                          ;*FREE RUNNING DATA TEST (INTERRUPT DRIVEN EXERCISER)
2805                                          ;*THIS TEST REPEATEDLY QUEUES UP 7 RECEIVE BUFFERS AND
2806                                          ;*7 TRANSMIT BUFFERS AND CHECKS DATA WHEN ALL 7 BUFFERS
2807                                          ;*ARE RECEIVED. TRANSMIT COUNTS RANGE FROM 2 TO 104.
2808                                          ;*DATA IS A BINARY COUNT PATTERN. THE RESUME FUNCTION
2809                                          ;*IS CHECKED IN THIS TEST. THIS TEST USES THE TURNAROUND CONNECTOR
2810                                          ;*IF IT IS PRESENT, OTHERWISE LINE UNIT LOOP IS SET.
2811                                          ;;*************************************************************
2812
2813                                          ;  TEST 12
2814                                          ;-------------
2815                                  ;;*************************************************************
2816  016370  000004                  TST12:  SCOPE
2817  016372  012737  000012  001202          MOV     #12,$TSTNM              ; LOAD THE NO. OF THIS TEST
```

```
2818  C16400  012737  003662  001442                    MOV     #$EOP,NEXT              ; POINT TO THE START OF NEXT TEST.
2819                                                                                    ;R1 CONTAINS BASE KMC11 ADDRESS
2820  016406  104410                                    MSTCLR                          ;MASTER CLEAR KMC11
2821                                              ;     $SKIPT  ENDEX1
2822  016410  012737  000340  177776                    MOV     #340,PS                 ;LOCK OUT INTERRUPTS
2823  016416  013700  002050                          MOV     STAT1,R0                ;GET BR LEVEL
2824  016422  006200                                    ASR     R0                      ;SHIFT RIGHT 4 TIMES
2825  016424  006200                                    ASR     R0
2826  016426  006200                                    ASR     R0
2827  016430  006200                                    ASR     R0
2828  016432  042700  177437                          BIC     #177437,R0              ;PUT BR LEVEL IN R0
2829  016436  012777  017132  163412                    MOV     #IISR,@KMRVEC           ;LOAD INPUT VECTOR
2830  016444  010077  163410                          MOV     R0,@KMRLVL              ;LOAD LEVEL
2831  016450  012777  017422  163404                    MOV     #OISR,@KMTVEC           ;LOAD OUTPUT VECTOR
2832  016456  010077  163402                          MOV     R0,@KMTLVL              ;LOAD LEVEL
2833
2834                                                    ;INITIALIZE ALL BUFFER LISTS AND COUNT LISTS
2835
2836  016462  012737  000104  021306                    MOV     #104,TFLAG              ;TFLAG CONTAINS COUNT
2837  016470  012700  020054                          MOV     #XMITBA+2,R0            ;R0 POINTS TO BA LIST
2838  016474  012703  020346                          MOV     #RBUFF,R3               ;R3 CONTAINS BUFFER ADDRESS
2839  016500  010320                              1$:  MOV     R3,(R0)+                ;LOAD BA LIST WITH REC BA
2840  016502  062703  000104                          ADD     #104,R3                 ;UPDATE BUFFER ADDRESS
2841  016506  022700  020072                          CMP     #XMITBA+20,R0           ;END OF REC BUFFERS?
2842  016512  001372                                    BNE     1$                      ;NO LOAD NEXT ONE
2843  016514  012720  020110                    2$:   MOV     #TBUFF,(R0)+            ;LOAD BA LIST WITH XMIT BA
2844  016520  022700  020110                          CMP     #XMITBA+36,R0           ;END OF XMIT BUFFERS?
2845  016524  001373                                    BNE     2$                      ;NO LOAD NEXT BUFFER
2846  016526  012700  020222                          MOV     #RCNTAB+2,R0            ;R0 POINTS TO COUNT LIST
2847  016532  013720  021306                    3$:   MOV     TFLAG,(R0)+             ;LOAD COUNT OF 104
2848  016536  022700  020240                          CMP     #RCNTAB+20,R0           ;END OF REC COUNT LIST?
2849  016542  001373                                    BNE     3$                      ;BR IF NO
2850  016544  012737  000005  021304                    MOV     #5,FLAG ;LOOP COUNT
2851  016552  012711  040000                          MOV     #BIT14,(R1)             ;SET MASTER CLEAR
2852                                              ;     BIT     #BIT15,STAT1            ;IOP?
2853                                              ;     BEQ     .+6                     ;BR IF NO
2854  016556  012711  100000                          MOV     #BIT15,(R1)             ;SET RUN ON IOP
2855  016562  012700  177777                          MOV     #-1,R0                  ;R0 IS INPUT DONE COUNTER
2856  016566  005037  020050                    CLRTAB: CLR     RESUME                  ;CLEAR RESUME FLAG
2857  016572  012705  020256                          MOV     #RDNTAB,R5              ;GET READY TO CLEAR ALL RECEIVE
2858  016576  005025                              2$:   CLR     (R5)+                   ;BUFFERS
2859  016600  022705  021302                          CMP     #RBUFFE,R5              ;END OF BUFFER?
2860  016604  001374                                    BNE     2$                      ;BR IF NO
2861  016606  012704  020240                          MOV     #XCNTAB,R4              ;R4 POINTS TO XMIT COUNT LIST
2862  016612  013724  021306                    4$:   MOV     TFLAG,(R4)+             ;LOAD XMIT CHAR COUNT
2863  016616  022704  020256                          CMP     #XCNTAB+16,R4           ;DONE?
2864  016622  001373                                    BNE     4$                      ;BR IF NO
2865  016624  005002                              5$:   CLR     R2                      ;R2 IS OUTPUT DONE COUNTER
2866  016626  005004                                    CLR     R4                      ;R4 IS USED AS INDEX IN OISR
2867  016630  005711                                    TST     (R1)                    ;IS RUN SET?
2868  016632  100376                                    BPL     .-2                     ;WAIT FOR RUN
2869  016634  152761  000100  000002                    BISB    #BIT6,2(R1)             ;SET IEO
2870  016642  032737  040000  002050                    BIT     #BIT14,STAT1            ;LOOP BACK CONNECTOR?
2871  016650  001002                                    BNE     .+6                     ;BR IF YES
2872  016652  052711  004000                          BIS     #BIT11,(R1)             ;SET LINE UNIT LOOP
2873  016656  022737  000005  021304                    CMP     #5,FLAG                 ;FIRST TIME?
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2874  016664  001003                        BNE     1$              ;BR IF NOT
2875  016666  052711  000143                BIS     #143,(R1)       ;SET IEI,RQI,BASEMC I
2876  016672  000402                        BR      3$              ;CONTINUE
2877  016674  052711  000144          1$:   BIS     #144,(R1)       ;SET IEI, RQI, RFC BA/CC
2878  016700  005037  011122          3$:   CLR     TEMP            ;SET UP FOR DELAY COUNT
2879  016704  012737  000022  001300        MOV     #22,$TMP1       ;GET SET FOR DELAY
2880  016712  005037  177776                CLR     PS              ;ALLOW INTERRUPTS
2881  016716  022700  000020          SCAN: CMP     #20,R0          ;INPUT DONE?
2882  016722  001402                        BEQ     SCAN2           ;BR IF YES
2883  016724  000137  017102                JMP     SCAN1           ;BR IF NO
2884  016730  022702  000034          SCAN2:CMP     #34,R2          ;XMIT DONE FOR ALL MESSAGES?
2885  016734  001402                        BEQ     8$              ;BR IF YES
2886  016736  000137  017102                JMP     SCAN1           ;BR IF NO
2887  016742  022704  000034          8$:   CMP     #34,R4          ;REC DONE FOR ALL MESSAGES?
2888  016746  001402                        BEQ     9$              ;BR IF YES
2889  016750  000137  017102                JMP     SCAN1           ;BR IF NO
2890  016754                          9$:
2891  016754  012700  020256                MOV     #RDNTAB,R0      ;GET FIRST REC BUFFER
2892  016760  012002                  5$:   MOV     (R0)+,R2        ;R2 POINTS TO BUFFER
2893  016762  005005                        CLR     R5              ;R5=EXPECTED
2894  016764  005003                        CLR     R3              ;R3 = COUNT
2895  016766  010237  001302          6$:   MOV     R2,$TMP2        ;SAVE ADDRESS FOR TYPEOUT
2896  016772  112204                        MOVB    (R2)+,R4        ;GET RECEIVE DATA
2897  016774  120504                        CMPB    R5,R4           ;IS IT CORRECT?
2898  016776  001401                        BEQ     .+4             ;BR IF YES
2899  017000  104013                        ERROR   13              ;DATA ERROR
2900  017002  005205                        INC     R5              ;NEXT CHARACTER
2901  017004  005203                        INC     R3              ;INC COUNT
2902  017006  021003                        CMP     (R0),R3         ;DONE YET?
2903  017010  001366                        BNE     6$              ;BR IF NO
2904  017012  062700  000002                ADD     #2,R0           ;GET NEXT REC BUFFER
2905  017016  022700  020312                CMP     #RDNTAB+34,R0   ;DONE YET?
2906  017022  001356                        BNE     5$              ;BR IF NO
2907  017024  012700  000001                MOV     #1,R0           ;SET R0 TO 1
2908  017030  032737  000001  021304  4$:   BIT     #BIT0,FLAG      ;CHANGE CHAR COUNT FOR NEXT LOOP
2909  017036  001003                        BNE     1$              ;BR TO SUB 40
2910  017040  005337  021306                DEC     TFLAG           ;DEC BY ONE
2911  017044  000403                        BR      2$              ;CONTINUE
2912  017046  162737  000040  021306  1$:   SUB     #40,TFLAG       ;SUBTRACT 40 FROM XMIT COUNT
2913  017054  005337  021304  2$:   DEC     FLAG            ;DEC LOOP COUNT
2914  017060  001242                        BNE     CLRTAB          ;GO DO IT AGAIN
2915  017062  152711  000146          ENDEX:BISB    #146,(R1)       ;SHUT DOWN KMC
2916  017066  005737  021304          1$:   TST     FLAG            ;HAS INTERRUPT OCCURED?
2917  017072  001775                        BEQ     1$              ;BR IF NO
2918  017074  000400                        BR      ENDEX1          ;ALL OK GET OUT
2919  017076  000004                ENDEX1: SCOPE                   ;SCOPE THIS TEST
2920  017100  104420                ENDEX2: ADVANCE
2921  017102  005337  011122          SCAN1:DEC     TEMP            ;DECREMENT DELAY COUNTER
2922  017106  001402                        BEQ     1$              ;BR IF ZERO
2923  017110  000137  016716                JMP     SCAN            ;BR IF NOT DONE DELAY
2924  017114  005337  001300          '$:   DEC     $TMP'           ;DEC DELAY COUNT
2925  017120  001402                        BEQ     2$              ;BR IF DONE DELAY
2926  017122  000137  016716                JMP     SCAN            ;BR IF NOT DONE
2927  017126  104001                  2$:   ERROR   1               ;ERROR HUNG
2928  017130  000762                        BR      ENDEX1          ;GET OUT
2929
```

```
2930                                                    ;INPUT INTERRUPT SERVICE ROUTINE
2931
2932  017132  022700  000017              IISR:   CMP     #17,R0          ;PROC. ERROR DONE?
2933  017136  001421                      BEQ     12$             ;BR IF YES
2934  017140  005737  020050              TST     RESUME          ;IS THIS A RESUME INTERRUPT
2935  017144  001432                      BEQ     8$              ;BR IF NO
2936  017146  032711  000002              BIT     #BIT1,(R1)      ;CNTL OR BASEMC?
2937  017152  001407                      BEQ     13$             ;BR IF CNTL I
2938  017154  012761  021430  000004      MOV     #BASEMC,4(R1)   ;LOAD BASEMC ADDRESS
2939  017162  012761  010000  000006      MOV     #BIT12,6(R1)    ;WITH RESUME BIT SET
2940  017170  000404                      BR      12$             ;CONTINUE
2941  017172  005061  000006      13$:    CLR     6(R1)           ;SELECT FULL DUPLEX
2942  017176  005037  020050              CLR     RESUME          ;CLEAR RESUME FLAG
2943  017202  142711  000040      12$:    BICB    #40,(R1)        ;CLEAR RQI
2944  017206  105711                      TSTB    (R1)            ;IS RDI GONE?
2945  017210  100776                      BMI     .-2             ;BR IF NO
2946  017212  005737  020050              TST     RESUME          ;BASEMC OR CNTL I?
2947  017216  001403                      BEQ     14$             ;BR IF IT WAS CNTL I
2948  017220  152711  000041              BISB    #41,(R1)        ;ASK FOR CNTL I
2949  017224  000002                      RTI                     ;RETURN
2950  017226  105011              14$:    CLRB    (R1)            ;CLEAR BSEL 0
2951  017230  000002                      RTI                     ;RETURN
2952  017232  005700              8$:     TST     R0              ;FIRST TIME HERE?
2953  017234  100006                      BPL     7$              ;LOAD BASEMC IF MINUS
2954  017236  012761  021430  000004      MOV     #BASEMC,4(R1)   ;SET UP BASEMC ADDRESS
2955  017244  005061  000006              CLR     6(R1)           ;CLEAR COUNT
2956  017250  000434                      BR      3$              ;CONTINUE
2957  017252  001003              7$:     BNE     1$              ;CNTL I FULL DUPLEX IF 0
2958  017254  005061  000006              CLR     6(R1)           ;SELECT FULL DUPLEX
2959  017260  000430                      BR      3$              ;CONTINUE
2960  017262  032700  000010      1$:     BIT     #BIT3,R0        ;XMIT?
2961  017266  001013                      BNE     2$              ;BR IF YES
2962  017270  000241                      CLC                     ;CLEAR CARRY
2963  017272  006100                      ROL     R0              ;MAKE R0 EVEN
2964  017274  016061  020052  000004      MOV     RECBA(R0),4(R1) ;LOAD REC BUFFER
2965  017302  016061  020220  000006      MOV     RCNTAB(R0),6(R1);LOAD COUNT
2966  017310  000241                      CLC                     ;CLEAR CARRY
2967  017312  006000                      ROR     R0              ;GET R0 BACK
2968  017314  000412                      BR      3$              ;CONTINUE
2969  017316  000241              2$:     CLC                     ;CLEAR CARRY
2970  017320  006100                      ROL     R0              ;MAKE IT EVEN
2971  017322  016061  020052  000004      MOV     XMITBA(R0),4(R1);LOAD XMIT BUFFER
2972  017330  016061  020220  000006      MOV     RCNTAB(R0),6(R1);LOAD COUNT
2973  017336  000241                      CLC                     ;CLEAR CARRY
2974  017340  006000                      ROR     R0              ;PUT IT BACK
2975  017342  142711  000040      3$:     BICB    #40,(R1)        ;CLEAR RQI
2976  017346  105711                      TSTB    (R1)            ;WAIT FOR
2977  017350  100776                      BMI     .-2             ;RDI TO GO AWAY
2978  017352  005200                      INC     R0              ;INC COUNT
2979  017354  001003                      BNE     6$              ;IF 0 ASK FOR CNTL I
2980  017356  152711  000041              BISB    #41,(R1)        ;ASK FOR CNTL I
2981  017362  000002                      RTI                     ;RETURN
2982  017364  022700  000017      6$:     CMP     #17,R0          ;DONE YET?
2983  017370  001411                      BEQ     4$              ;BR IF YES
2984  017372  032700  000010              BIT     #BIT3,R0        ;XMIT?
2985  017376  001003                      BNE     5$              ;BR IF YES
```

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2986  017400  152711  000044                        BISB    #44,(R1)        ;ASK FOR REC BA/CC
2987  017404  000002                                RTI                     ;RETURN
2988  017406  152711  000040                5$:    BISB    #40,(R1)        ;ASK FOR XMIT BA/CC
2989  017412  000002                                RTI                     ;RETURN
2990  017414  152711  000046                4$:    BISB    #46,(R1)        ;FORCE PROC. ERROR
2991  017420  000002                                RTI                     ;RETURN
2992
2993                                                ;OUTPUT INTERRUPT SERVICE ROUTINE
2994
2995  017422  032761  000001  000002        OISR:   BIT     #BIT0,2(R1)     ;IS THIS AN ERROR?
2996  017430  001463                                BEQ     1$              ;BR IF NO
2997  017432  005737  021304                        TST     FLAG            ;IS THIS SHUT DOWN INTERRUPT?
2998  017436  001006                                BNE     9$              ;BR IF NO
2999  017440  005237  021304                        INC     FLAG            ;YES MAKE FLAG NON-ZERO
3000  017444  022761  001000  000006              CMP     #BIT9,6(R1)     ;SHUT DOWN BIT SET?
3001  017452  001525                                BEQ     10$             ;YES ALL IS OK
3002  017454  022700  000017                9$:    CMP     #17,R0          ;RESUME INTERRUPT?
3003  017460  001035                                BNE     11$             ;BR IF NO
3004  017462  022761  001000  000006              CMP     #BIT9,6(R1)     ;PROC. ERROR BIT SET?
3005  017470  001031                                BNE     11$             ;BR IF NO
3006  017472  005200                                INC     R0              ;BUMP COUNTER (TO 20)
3007  017474  012711  040000                        MOV     #BIT14,(R1)     ;MASTER CLEAR DEVICE
3008                                          ;     BIT     #BIT15,STAT1    ;KMC OR KMC?
3009                                          ;     BEQ     .+14            ;BR IF KMC
3010  017500  012711  100000                        MOV     #BIT15,(R1)     ;SET RUN ON KMC
3011  017504  105227  000000                        INCB    #0              ;DELAY ON KMC
3012  017510  001375                                BNE     .-4
3013  017512  012737  177777  020050                MOV     #-1,RESUME      ;SET RESUME FLAG
3014  017520  005711                                TST     (R1)            ;RUN SET?
3015  017522  100376                                BPL     .-2             ;BR IF NO
3016  017524  012761  000100  000002                MOV     #BIT6,2(R1)     ;SET IEO
3017  017532  032737  040000  002050                BIT     #BIT14,STAT1    ;LOOP BACK CONNECTOR?
3018  017540  001002                                BNE     .+6             ;BR IF YES
3019  017542  052711  004000                        BIS     #BIT11,(R1)     ;SET LINE UNIT LOOP
3020  017546  052711  000143                        BIS     #143,(R1)       ;ASK FOR PORT (BASEMC REQUEST)
3021  017552  000002                                RTI                     ;RETURN
3022  017554  016137  000004  001302        11$:    MOV     4(R1),$TMP2     ;SAVE FOR ERROR TYPEOUT
3023  017562  016137  000006  001304                MOV     6(R1),$TMP3     ;SAVE FOR ERROR TYPEOUT
3024  017570  104016                                ERROR   16              ;CNTL O ERROR
3025  017572  022626                                CMP     (SP)+,(SP)+     ;ADJUST STACK
3026  017574  000137  017076                        JMP     ENDEX1          ;GET OUT
3027  017600  032761  000004  000002        1$:     BIT     #BIT2,2(R1)     ;RECEIVE?
3028  017606  001053                                BNE     2$              ;BR IF YES
3029  017610  022761  020110  000004              CMP     #TBUFF,4(R1)    ;IS XMIT BA CORRECT?
3030  017616  001412                                BEQ     4$              ;BR IF OK
3031  017620  022761  020111  000004              CMP     #TBUFF+1,4(R1)  ;IS XMIT BA CORRECT?
3032  017626  001406                                BEQ     4$              ;BR IF YES
3033  017630  012705  020110                        MOV     #TBUFF,R5       ;R5 = EXPECTED
3034  017634  016137  000004  001302                MOV     4(R1),$TMP2     ;SAVE FOUND FOR TYPEOUT
3035  017642  104002                                ERROR   2               ;XMIT BA ERROR
3036  017644  005005                        4$:     CLR     R5              ;R5 IS INDEX REG
3037  017646  026561  020240  000006        5$:     CMP     XCNTAB(R5),6(R1);IS CHAR COUNT OK?
3038  017654  001406                                BEQ     6$              ;BR IF YES
3039  017656  062705  000002                        ADD     #2,R5           ;INC INDEX
3040  017662  022705  000016                        CMP     #16,R5          ;DONE LIST YET?
3041  017666  001367                                BNE     5$              ;BR IF NO
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3042  017670  104003                          ERROR   3               ;XMIT COUNT ERROR
3043  017672  016162  000004  020312    6$:   MOV     4(R1),XDNTAB(R2);STORE XMIT DONE BA
3044  017700  062702  000002                  ADD     #2,R2           ;INC INDEX
3045  017704  016162  000006  020312          MOV     6(R1),XDNTAB(R2);STORE XMIT DONE CC
3046  017712  062702  000002                  ADD     #2,R2           ;INC INDEX
3047  017716  142761  000207  000002          BICB    #207,2(R1)      ;CLEAR RDO
3048  017724  000002                          RTI                     ;RETURN
3049  017726  105011                    10$:  CLRB    (R1)            ;CLEAR SEL0
3050  017730  105061  000002                  CLRB    2(R1)           ;CLEAR SEL2
3051  017734  000002                          RTI                     ;RETURN
3052  017736  012705  000002              2$:  MOV     #2,R5           ;SET UP R5 AS INDEX
3053  017742  026561  020052  000004          CMP     RECBA(R5),4(R1) ;COMPARE WITH LIST OF CORRECT BA'S
3054  017750  001406                          BEQ     3$              ;BR IF OK?
3055  017752  062705  000002                  ADD     #2,R5           ;INCREMENT R5
3056  017756  022705  000020                  CMP     #20,R5          ;END OF LIST?
3057  017762  001367                          BNE     2$+4            ;BR IF NO
3058  017764  104004                          ERROR   4               ;REC BA ERROR
3059  017766  005005                    3$:   CLR     R5              ;R5 IS INDEX
3060  017770  026561  020240  000006    7$:   CMP     XCNTAB(R5),6(R1);CHECK FOR CORRECT REC COUNT
3061  017776  001406                          BEQ     8$              ;BR IF YES
3062  020000  062705  000002                  ADD     #2,R5           ;INCREMENT R5
3063  020004  022705  000016                  CMP     #16,R5          ;END OF LIST?
3064  020010  001367                          BNE     7$              ;BR IF NOT
3065  020012  104005                          ERROR   5               ;REC COUNT ERROR
3066  020014  016164  000004  020256    8$:   MOV     4(R1),RDNTAB(R4)  ;STORE REC BA
3067  020022  062704  000002                  ADD     #2,R4           ;INC INDEX
3068  020026  016164  000006  020256          MOV     6(R1),RDNTAB(R4);STORE REC DONE CC
3069  020034  062704  000002                  ADD     #2,R4           ;INC INDEX
3070  020040  142761  000207  000002          BICB    #207,2(R1)      ;CLEAR RDO
3071  020046  000002                          RTI                     ;RETURN
3072
3073
3074                                          ;BUFFERS
3075
3076  020050  000000                    RESUME: 0
3077  020052                            RECBA:
3078  020052  000017                    XMITBA: .BLKW   17      ;REC & XMIT BA LIST
3079
3080  020110                            TBUFF:                  ;TRANSMIT DATA
3081  020110      000     001     002   .BYTE   0,1,2,3,4,5,6,7
3082  020113      003     004     005
3083  020116      006     007
3084  020120      010     011     012   .BYTE   10,11,12,13,14,15,16,17
3085  020123      013     014     015
3086  020126      016     017
3087  020130      020     021     022   .BYTE   20,21,22,23,24,25,26,27
3088  020133      023     024     025
3089  020136      026     027
3090  020140      030     031     032   .BYTE   30,31,32,33,34,35,36,37
3091  020143      033     034     035
3092  020146      036     037
3093  020150      040     041     042   .BYTE   40,41,42,43,44,45,46,47
3094  020153      043     044     045
3095  020156      046     047
3096  020160      050     051     052   .BYTE   50,51,52,53,54,55,56,57
3097  020163      053     054     055
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3098  020166  056     057
3099  020170  060     061     062          .BYTE   60,61,62,63,64,65,66,67
3100  020173  063     064     065
3101  020176  066     067
3102  020200  070     071     072          .BYTE   70,71,72,73,74,75,76,77
3103  020203  073     074     075
3104  020206  076     077
3105  020210  100     101     102          .BYTE   100,101,102,103,104,105,106,107
3106  020213  103     104     105
3107  020216  106     107
3108
3109  020220  000010                       RCNTAB: .BLKW   10              ,RECEIVE COUNT TABLE
3110  020240  000007                       XCNTAB: .BLKW   7               ;TRANSMIT COUNT TABLE
3111
3112  020256  000016                       RDNTAB: .BLKW   16              ;RECEIVE DONE TABLE (BA/CC)
3113  020312  000016                       XDNTAB: .BLKW   16              ;XMIT DONE TABLE (BA/CC)
3114
3115  020346                               RBUFF:                          ;RECEIVER BUFFERS
3116  020346  000104                       RBUFF1:  .BLKB 104
3117  020452  000104                       RBUFF2:  .BLKB 104
3118  020556  000104                       RBUFF3:  .BLKB 104
3119  020662  000104                       RBUFF4:  .BLKB 104
3120  020766  000104                       RBUFF5:  .BLKB 104
3121  021072  000104                       RBUFF6:  .BLKB 104
3122  021176  000104                       RBUFF7:  .BLKB 104
3123  021302  000000                       RBUFFE: 0                       ;END OF RECEIVER BUFFERS
3124
3125
3126
3127                                                 ;BUFFER AREA
3128                                                 ;-----------
3129
3130  021304  000000                       FLAG:   0
3131  021306  000000                       TFLAG:  0
3132  021310  000000                       RFLAG:  0
3133  021312  000044                       TCOUNT: 44
3134  021314  041101  042103  043105       TBUF:   .ASCII/ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789/
3135  021322  044107  045111  046113
3136  021330  047115  050117  051121
3137  021336  052123  053125  054127
3138  021344  055131  030460  031462
3139  021352  032464  033466  034470
3140                                         .EVEN
3141  021360  000044                       RCOUNT: 44
3142  021362  021430                       RBUF:   .-.+46
3143                                         .EVEN
3144  021430  022030                       BASEMC: .=.+256.
3145
3146
3147                                         ;SUBROUTINES
3148                                         ;-----------
3149
3150
3151  022030                               BASELD:
3152                                                 ;THIS SUBROUTINE LOADS THE KMC WITH A BASEMC ADDRESS
3153                                                 ;AND PUTS KMC INTO FULL-DUPLEX MODF
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3154
3155  022030  012711  040000                    MOV     #BIT14,(R1)     ;MASTER CLEAR
3156                                        ;     BIT     #BIT15,STAT1    ;CRAM?
3157                                        ;     BEQ     .+6             ;BR IF NO
3158  022034  012711  100000                    MOV     #BIT15,(R1)     ;IF CRAM SET RUN
3159  022040  105227  000000                    INCB    #0              ;DELAY
3160  022044  001375                          1$: BNE     .-4             ;BR IF NOT DONE DELAY
3161  022046  005711                          1$: TST     (R1)            ;IS RUN SET?
3162  022050  100376                              BPL     1$              ;BR IF NO
3163  022052  052711  004000                    BIS     #BIT11,(R1)     ;SET LU LOOP
3164  022056  152711  000043                    BISB    #43,(R1)        ;BASEMC REQUEST
3165  022062  105711                          2$: TSTB    (R1)            ;RDY I SET?
3166  022064  100376                              BPL     2$              ;BR IF NO
3167  022066  012761  021430  000004            MOV     #BASEMC,4(R1)   ;LOAD BASEMC ADDRESS
3168  022074  005061  000006                    CLR     6(R1)           ;CLEAR CC
3169  022100  142711  000040                    BICB    #40,(R1)        ;CLEAR RQI
3170  022104  105711                          3$: TSTB    (R1)            ;RDY I CLEAR?
3171  022106  100776                              BMI     3$              ;BR IF NO
3172  022110  152711  000041                    BISB    #41,(R1)        ;ASK FOR CNTL I
3173  022114  105711                         64$: TSTB    (R1)            ;WAIT FOR RDI
3174  022116  100376                              BPL     64$             ;BR IF NOT SETY
3175  022120  005061  000006                    CLR     6(R1)           ;SET FULL DUPLEX
3176  022124  142711  000040                    BICB    #40,(R1)        ;CLEAR RQI
3177  022130  105711                         65$: TSTB    (R1)            ;RDI UP?
3178  022132  100776                              BMI     65$             ;BR IF YES
3179  022134  000207                          RTS     PC              ;RETURN
3180
3181  022136                                BASELH:
3182                                        ;THIS SUBROUTINE LOADS THE KMC WITH A BASEMC ADDRESS
3183                                        ;AND PUTS KMC INTO HALF-DUPLEX MODE
3184
3185  022136  012711  040000                    MOV     #BIT14,(R1)     ;MASTER CLEAR
3186                                        ;     BIT     #BIT15,STAT1    ;CRAM?
3187                                        ;     BEQ     .+6             ;BR IF NO
3188  022142  012711  100000                    MOV     #BIT15,(R1)     ;IF CRAM SET RUN
3189  022146  105227  000000                    INCB    #0              ;DELAY
3190  022152  001375                          1$: BNE     .-4             ;BR IF NOT DONE DELAY
3191  022154  005711                          1$: TST     (R1)            ;IS RUN SET?
3192  022156  100376                              BPL     1$              ;BR IF NO
3193  022160  052711  004000                    BIS     #BIT11,(R1)     ;SET LU LOOP
3194  022164  152711  000043                    BISB    #43,(R1)        ;BASEMC REQUEST
3195  022170  105711                          2$: TSTB    (R1)            ;RDY I SET?
3196  022172  100376                              BPL     2$              ;BR IF NO
3197  022174  012761  021430  000004            MOV     #BASEMC,4(R1)   ;LOAD BASEMC ADDRESS
3198  022202  005061  000006                    CLR     6(R1)           ;CLEAR CC
3199  022206  142711  000040                    BICB    #40,(R1)        ;CLEAR RQI
3200  022212  105711                          3$: TSTB    (R1)            ;RDY I CLEAR?
3201  022214  100776                              BMI     3$              ;BR IF NO
3202  022216  152711  000041                    BISB    #41,(R1)        ;ASK FOR CNTL I
3203  022222  105711                         64$: TSTB    (R1)            ;WAIT FOR RDI
3204  022224  100376                              BPL     64$             ;BR IF NOT SETY
3205  022226  012761  002000  000006            MOV     #BIT10,6(R1)    ;SET HALF DUPLEX
3206  022234  142711  000040                    BICB    #40,(R1)        ;CLEAR RQI
3207  022240  105711                         65$: TSTB    (R1)            ;RDI UP?
3208  022242  100776                              BMI     65$             ;BR IF YES
3209  022244  000207                          RTS     PC              ;RETU
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3210
3211  022246                                    RESUM:
3212                                                    ;THIS SUBROUTINE LOADS THE KMC WITH A BASEMC ADDRESS
3213                                                    ;WITH RESUME BIT SET AND PUTS KMC INTO FULL-DUPLEX MODE
3214
3215  022246  012711  040000                            MOV     #BIT14,(R1)     ;MASTER CLEAR
3216                                            ;       BIT     #BIT15,STAT1    ;CRAM?
3217                                            ;       BEQ     .+6             ;BR IF NO
3218  022252  012711  100000                            MOV     #BIT15,(R1)     ;IF CRAM SET RUN
3219  022256  105227  000000                            INCB    #0              ;DELAY
3220  022262  001375                                    BNE     .-4             ;BR IF NOT DONE DELAY
3221  022264  005711                            1$:     TST     (R1)            ;IS RUN SET?
3222  022266  100376                                    BPL     1$              ;BR IF NO
3223  022270  052711  004000                            BIS     #BIT11,(R1)     ;SET LU LOOP
3224  022274  152711  000043                            BISB    #43,(R1)        ;BASEMC REQUEST
3225  022300  105711                            2$:     TSTB    (R1)            ;RDY I SET?
3226  022302  100376                                    BPL     2$              ;BR IF NO
3227  022304  012761  021430  000004                    MOV     #BASEMC,4(R1)   ;LOAD BASEMC ADDRESS
3228  022312  012761  010000  000006                    MOV     #BIT12,6(R1)    ;SET RESUME BIT
3229  022320  142711  000040                            BICB    #40,(R1)        ;CLEAR RQI
3230  022324  105711                            3$:     TSTB    (R1)            ;RDY I CLEAR?
3231  022326  100776                                    BMI     3$              ;BR IF NO
3232  022330  152711  000041                            BISB    #41,(R1)        ;ASK FOR CNTL I
3233  022334  105711                            64$:    TSTB    (R1)            ;WAIT FOR RDI
3234  022336  100376                                    BPL     64$             ;BR IF NOT SETY
3235  022340  005061  000006                            CLR     6(R1)           ;SET FULL DUPLEX
3236  022344  142711  000040                            BICB    #40,(R1)        ;CLEAR RQI
3237  022350  105711                            65$:    TSTB    (R1)            ;RDI UP?
3238  022352  100776                                    BMI     65$             ;BR IF YES
3239  022354  000207                                    RTS     PC              ;RETURN
3240
3241  022356                                    RFRELD:
3242                                                    ;THIS SUBROUTINE LOADS THE KMC WITH A RECEIVE BA/CC
3243
3244  022356  152711  000044                            BISB    #44,(R1)        ;REC BA/CC REQUEST
3245  022362  105711                            1$:     TSTB    (R1)            ;RDY I SET?
3246  022364  100376                                    BPL     1$              ;BR IF NO
3247  022366  012561  000004                            MOV     (R5)+,4(R1)     ;LOAD REC BA
3248  022372  012561  000006                            MOV     (R5)+,6(R1)     ;LOAD REC CC
3249  022376  142711  000040                            BICB    #40,(R1)        ;CLEAR RQI
3250  022402  105711                            2$:     TSTB    (R1)            ;IS RDY I CLEAR
3251  022404  100776                                    BMI     2$              ;BR IF NO
3252  022406  000205                                    RTS     R5              ;RETURN
3253
3254  022410                                    XFRELD:
3255                                                    ;THIS SUBROUTINE LOADS THE KMC WITH A TRANSMIT BA/CC
3256
3257  022410  152711  000040                            BISB    #40,(R1)        ;XMIT BA/CC REQUEST
3258  022414  105711                            1$:     TSTB    (R1)            ;RDY I SET?
3259  022416  100376                                    BPL     1$              ;BR IF NO
3260  022420  012561  000004                            MOV     (R5)+,4(R1)     ;LOAD XMIT BA
3261  022424  012561  000006                            MOV     (R5)+,6(R1)     ;LOAD XMIT CC
3262  022430  142711  000040                            BICB    #40,(R1)        ;CLEAR RQI
3263  022434  105711                            2$:     TSTB    (R1)            ;IS RDY I CLEAR
3264  022436  100776                                    BMI     2$              ;BR IF NO
3265  022440  000205                                    RTS     R5              ;RETURN
```

```
3266
3267
3268  022442                                  SHUTDOWN:
3269                                                  ;THIS SUBROUTINE FORCES THE KMC TO UPDATE THE BASEMC TABLE
3270
3271  022442  042761  000207  000002                BIC     #207,2(R1)      ;CLEAR ANY OUTPUT DONES
3272  022450  152711  000046                        BISB    #46,(R1)        ;ASK FOR ILLEGAL REQUEST
3273  022454  105711                          1$:   TSTB    (R1)            ;RDI SET?
3274  022456  100376                                BPL     1$              ;BR IF NO
3275  022460  142711  000040                        BICB    #40,(R1)        ;CLEAR RQI
3276  022464  105761  000002                  2$:   TSTB    2(R1)           ;OUTPUT DONE SET?
3277  022470  100375                                BPL     2$              ;BR IF NOT
3278  022472  000207                                RTS     PC              ;RETURN
3279  022474  012711  040000                LDRVRF: MOV     #BIT14,(R1)     ;MASTER CLEAR KMC-11.
3280  022500  042711  140000                        BIC     #BIT15!BIT14,(R1)       ;AND SHUT IT DOWN.
3281  022504  005000                                CLR     R0              ;CLEAR UPC POINTER.
3282  022506  004737  022614                        JSR     PC,SETMAP       ;SET MICRO-CODE POINTER IN R2.
3283  022512  005011                          3$:   CLR     (R1)            ;START WITH THE CLEAN WORLD.
3284  022514  010061  000004                        MOV     R0,4(R1)        ;LOAD CRAM ADDRESS.
3285  022520  012261  000006                        MOV     (R2)+,6(R1)     ;LOAD INSTRUCTION WORD.
3286  022524  012711  002000                        MOV     #BIT10,(R1)     ;SET ROM 0.
3287  022530  012711  022000                        MOV     #BIT13!BIT10,(R1)       ;WRITE IT...
3288  022534  005200                                INC     R0              ;UPDATE UPC POINTER.
3289  022536  022700  002000                        CMP     #2000,R0        ;OVER FLOW?
3290  022542  003363                                BGT     3$              ;BR IF NO.
3291  022544  004737  022614                VERFY:  JSR     PC,SETMAP       ;SET MICRO-CODE POINTER IN R2.
3292  022550  005000                                CLR     R0              ;SET UPC POINTER.
3293  022552  005011                          6$:   CLR     (R1)            ;START WITH THE CLEAN WORLD.
3294  022554  010061  000004                        MOV     R0,4(R1)        ;LOAD CRAM ADDRESS.
3295  022560  012711  002000                        MOV     #BIT10,(R1)     ;SET ROM 0.
3296  022564  026122  000006                        CMP     6(R1),(R2)+     ;CHECK IF RIGHT?
3297  022570  001402                                BEQ     9$              ;BR IF GOOD.
3298  022572  104401  011054                        TYPE    ,MLDER          ;LOADING ERROR.
3299  022576  005200                          9$:   INC     R0              ;BUMP UPC POINTER.
3300  022600  022700  002000                        CMP     #2000,R0        ;IS IT DONE?
3301  022604  003362                                BGT     6$              ;BR IF NO.
3302  022606  012711  040000                        MOV     #BIT14,(R1)     ;MASTER CLEAR KMC-11.
3303  022612  000207                                RTS     PC              ;RETURN.
3304
3305  022614  012702  023650                SETMAP: MOV     #LOMAP,R2       ;LOAD ADDRESS OF LOW SPEED.
3306  022620  032737  000002  002054                BIT     #BIT1,STAT3     ;IS IT HIGH SPEED?
3307  022626  001402                                BEQ     3$              ;BR IF NO.
3308  022630  012702  027654                        MOV     #HIMAP,R2       ;LOAD HIGH SPEED ADDRESS.
3309  022634  000207                          3$:   RTS     PC              ;RETURN TO CALLER.
3310
3311  023650                                  LOMAP:                  ;LOW SPEED (REMOTE) MICRO-CODE.
3312
```

```
3313            027654                  . 27654
3314
3315  027654                            HIMAP:                  ;HIGH SPEED (LOCAL) MICRO-CODE.
3316
```

```
3317
033654  052200  040522  051516          EM2:    .ASCIZ  <200>/TRANSMIT BA ERROR/
033677     200  051124  047101          EM3:    .ASCIZ  <200>/TRANSMIT COUNT ERROR/
033725     200  042522  042503          EM4:    .ASCIZ  <200>/RECEIVE BA ERROR/
033747     200  042522  042503          EM5:    .ASCIZ  <200>/RECEIVE COUNT ERROR/
033774  051200  041505  044505          EM11:   .ASCIZ  <200>/RECEIVE DATA ERROR/
034020  043200  042522  020105          EM12:   .ASCIZ  <200>/FREE RUNNING ERROR/
034044  041600  047117  051124          EM13:   .ASCIZ  <200>/CONTROL OUT ERROR/
034067     200  047111  042524          EM14:   .ASCIZ  <200>/INTERNAL DDCMP ERROR COUNTS NON ZERO/

034135     200  054105  042520          DH1:    .ASCIZ  <200>/EXPECTED  FOUND  ADDRESS/
034167     200  054105  042520          DH2:    .ASCIZ  <200>/EXPECTED  FOUND/
034210  020200  042523  032114          DH3:    .ASCIZ  <200>/ SEL4      SEL6/
034231     200  040502  042523          DH4:    .ASCIZ  <200>/BASEMC+3 THRU BASEMC+12 /
034263     200  046513  030503          DH5:    .ASCIZ  <200>/KMC11 IS HUNG/
                                        .EVEN

034302  000003                          DT1:    3
034304     006      004                         .BYTE   6,4
034306  001266                                  $REG2
034310     006      004                         .BYTE   6,4
034312  001272                                  $REG4
034314     004      002                         .BYTE   4,2
034316  001262                                  $REG0
034320  000003                          DT2:    3
034322     006      004                         .BYTE   6,4
034324  001274                                  $REG5
034326     006      004                         .BYTE   6,4
034330  001272                                  $REG4
034332     004      002                         .BYTE   4,2
034334  001266                                  $REG2
034336  000003                          DT3:    3
034340     006      004                         .BYTE   6,4
034342  001274                                  $REG5
034344     006      004                         .BYTE   6,4
034346  001272                                  $REG4
034350     004      002                         .BYTE   4,2
034352  001302                                  $TMP2
034354  000002                          DT4:    2
034356     003      007                         .BYTE   3,7
034360  001274                                  $REG5
034362     003      002                         .BYTE   3,2
034364  001272                                  $REG4
034366  000002                          DT5:    2
034370     006      004                         .BYTE   6,4
034372  001274                                  $REG5
034374     006      002                         .BYTE   6,2
034376  001272                                  $REG4
034400  000003                          DT6:    3
034402     003      010                         .BYTE   3,10
034404  001274                                  $REG5
034406     003      004                         .BYTE   3,4
034410  001272                                  $REG4
034412     004      002                         .BYTE   4,2
034414  021304                                  FLAG
034416  000003                          DT7:    3
```

```
034420     003     010                    .BYTE   3,10
034422  001274                            $REG5
034424     003     004                    .BYTE   3,4
034426  001272                            $REG4
034430     004     002                    .BYTE   4,2
034432  001266                            $REG2
034434  000003                 DT10:      3
034436     003     007                    .BYTE   3,7
034440  001274                            $REG5
034442     003     004                    .BYTE   3,4
034444  001272                            $REG4
034446     006     002                    .BYTE   6,2
034450  001302                            $TMP2
034452  000002                 DT11:      2
034454     006     004                    .BYTE   6,4
034456  001302                            $TMP2
034460     006     002                    .BYTE   6,2
034462  001304                            $TMP3
034464  000010                 DT12:      10
034466     003     002                    .BYTE   3,2
034470  001300                            $TMP1
034472     003     002                    .BYTE   3,2
034474  021434                            BASEMC+4
034476     003     002                    .BYTE   3,2
034500  001302                            $TMP2
034502     003     002                    .BYTE   3,2
034504  021436                            BASEMC+6
034506     003     002                    .BYTE   3,2
034510  001304                            $TMP3
034512     003     002                    .BYTE   3,2
034514  021440                            BASEMC+10
034516     003     002                    .BYTE   3,2
034520  001306                            $TMP4
034522     003     002                    .BYTE   3,2
034524  021442                            BASEMC+12
034526  000002                 DT13:      2
034530     006     004                    .BYTE   6,4
034532  001274                            $REG5
034534     006     002                    .BYTE   6,2
034536  001272                            $REG4

034540                         CORMAX:
        000001                 .END
```

```
ABASE = 000000
ACDW1 = 000000
ACDW2 = 000000
ACPUOP= 000000
ADDW0 = 000000
ADDW1 = 000000
ADDW10= 000000
ADDW11= 000000
ADDW12= 000000
ADDW13= 000000
ADDW14= 000000
ADDW15= 000000
ADDW2 = 000000
ADDW3 = 000000
ADDW4 = 000000
ADDW5 = 000000
ADDW6 = 000000
ADDW7 = 000000
ADDW8 = 000000
ADDW9 = 000000
ADEVCT= 000000
ADEVM = 000000
ADRCNT  006053
ADVANC= 104420
AENV  = 000002
AENVM = 000000
AFATAL= 000000
AMADR1= 000000
AMADR2= 000000
AMADR3= 000000
AMADR4= 000000
AMAMS1= 000000
AMAMS2= 000000
AMAMS3= 000000
AMAMS4= 000000
AMSGAD= 000000
AMSGLG= 000000
AMSGTY= 000000
AMTYP1= 000000
AMTYP2= 000000
AMTYP3= 000000
AMTYP4= 000000
APASS = 000000
APRIOR= 000000
APTCSU= 000040
APTENV= 000001
APTSIZ= 000200
APTSPO= 000100
APT.SI  013540
ASWREG= 000000
ATESTN= 000000
AUDONE  003354
AUNIT = 000000
AUSTRT  003126
AUSWR = 000000
AUTO.S  012124
AVECT1= 000000
AVECT2= 000000
BASE    013756
BASELD  022030
BASELH  022136
BASEMC  021430
BINWRD  006406
BIT0  = 000001
BIT00 = 000001
BIT01 = 000002
BIT02 = 000004
BIT03 = 000010
BIT04 = 000020
BIT05 = 000040
BIT06 = 000100
BIT07 = 000200
BIT08 = 000400
BIT09 = 001000
BIT1  = 000002
BIT10 = 002000
BIT11 = 004000
BIT12 = 010000
BIT13 = 020000
BIT14 = 040000
BIT15 = 100000
BIT2  = 000004
BIT3  = 000010
BIT4  = 000020
BIT5  = 000040
BIT6  = 000100
BIT7  = 000200
BIT8  = 000400
BIT9    001000
BM      010625
BPTVEC= 000014
BRLVL   013472
BRW     004354
CHRCNT  006404
CKSWR   011226
CKSWR1  011302
CKSWR2  011314
CKSWR3  011320
CKSWR4  011324
CKSWR5  011430
CLKX    001452
CLRTAB  016566
CNERR   011023
CNT.MA  002302
CNVRT = 104417
CONERR  010756
CONN    010665
CONTAB  003330
CONVRT= 104416
CORMAX  034540
CR    = 000015
CREAM   001502
CRLF  = 000200
CSR     010357
CSRMAP  012126
CYCLE   011474
DATABP  006760
DATACL= 104413
DATAHD  006746
DDISP = 177570
DELAY = 104411
DEVTAB  003342
DH1     034135
DH2     034167
DH3     034210
DH4     034231
DH5     034263
DISPLA  001242
DISPRE  000174
DSWR  = 177570
DT1     034302
DT10    034434
DT11    034452
DT12    034464
DT13    034526
DT2     034320
DT3     034336
DT4     034354
DT5     034366
DT6     034400
DT7     034416
DZDMH = 000000
EMTVEC= 000030
EM11    033774
EM12    034020
EM13    034044
EM14    034067
EM2     033654
EM3     033677
EM4     033725
EM5     033747
ENDEX   017062
ENDEX1  017076
ENDEX2  017100
ERCT00  002304
ERCT01  002310
ERCT02  002314
ERCT03  002320
ERCT04  002324
ERCT05  002330
ERCT06  002334
ERCT07  002340
ERCT10  002344
ERCT11  002350
ERCT12  002354
ERCT13  002360
ERCT14  002364
ERCT15  002370
ERCT16  002374
ERCT17  002400
ERR     003244
ERRMSG  006734
ERRPC   003322
ERRVEC= 000004
ERTABO  007106
EXIT  = 000205
EXITER  007042
FLAG    021304
FLOAT   003156
FY      003202
HALTS   006764
HILIM   006046
HIMAP   027654
HT    = 000011
IISR    017132
INCHAR  011434
INIFLG  001506
INLP1   005762
INPUT = 104415
INTTY   013506
IOTVEC= 000020
KMACTV  001470
KMCM    011044
KMCR00  002100
KMCR01  002110
KMCR02  002120
KMCR03  002130
KMCR04  002140
KMCR05  002150
KMCR06  002160
KMCR07  002170
KMCR10  002200
KMCR11  002210
KMCR12  002220
KMCR13  002230
KMCR14  002240
KMCR15  002250
KMCR16  002260
KMCR17  002270
KMCSR   002066
KMCSRH  002070
KMCTL   002072
KMNUM   001472
KMP04   002074
KMP06   002076
KMRLVL  002060
KMRVEC  002056
KMS100  002102
KMS101  002112
KMS102  002122
KMS103  002132
KMS104  002142
KMS105  002152
KMS106  002162
KMS107  002172
KMS110  002202
KMS111  002212
KMS112  002222
KMS113  002232
KMS114  002242
KMS115  002252
KMS116  002262
KMS117  002272
KMS200  002104
KMS201  002114
KMS202  002124
KMS203  002134
KMS204  002144
KMS205  002154
KMS206  002164
KMS207  002174
KMS210  002204
KMS211  002214
KMS212  002224
KMS213  002234
KMS214  002244
KMS215  002254
KMS216  002264
KMS217  002274
KMS300  002106
KMS301  002116
KMS302  002126
KMS303  002136
KMS304  002146
KMS305  002156
KMS306  002166
KMS307  002176
KMS310  002206
KMS311  002216
KMS312  002226
KMS313  002236
KMS314  002246
KMS315  002256
KMS316  002266
KMS317  002276
```

```
KMTLVL  002064
KMTVEC  002062
KM.END  002300
KM.MAP  002100
LDRVRF  022474
LF    = 000012
LINE    010567
LOBITS  006052
LOCK    001444
LOKFLG  001510
LOLIM   006044
LOMAP   023650
MASKX   001454
MASTEK  010011
MCSRX   007741
MDATA   011164
MEMLIM  001466
MEPASS  007614
MERRPC  010066
MERRX   007766
MERR2   007641
MERR3   007666
MILK    001504
MLDER   011054
MLOCK   007712
MNEW    010013
MODU    010455
MPASSX  007755
MPFAIL  007556
MR      007636
MRESET= 004000
MSTCLR= 104410
MTITLE  001000
MTSTN   007777
MVECX   007747
NEXT    001442
NOACT   010725
NODEV   003240
NUM     010317
OISR    017422
OK      003220
ONE     001464
PACT00  002302
PACT01  002306
PACT02  002312
PACT03  002316
PACT04  002322
PACT05  002326
PACT06  002332
PACT07  002336
PACT10  002342
PACT11  002346
PACT12  002352
PACT13  002356
PACT14  002362
PACT15  002366
PACT16  002372
PACT17  002376
PARBIT= 040000
PERFOR= 004537
PFTAB   007320
PIRQ  = 177772
PIRQVE= 000240
POPRO = 012600
POP1SP= 005726
POP2SP= 022626
PRIO    010416
PRIRTY  013760
PR0   = 000000
PR1   = 000040
PR2   = 000100
PR3   = 000140
PR4   = 000200
PR5   = 000240
PR6   = 000300
PR7   = 000340
PS    = 177776
PSW   = 177776
PUSHR0= 010046
PUSH1S= 005746
PUSH2S= 024646
PWRVEC= 000024
QV.FLG  001511
RBUF    021362
RBUFF   020346
RBUFFE  021302
RBUFF1  020346
RBUFF2  020452
RBUFF3  020556
RBUFF4  020662
RBUFF5  020766
RBUFF6  021072
RBUFF7  021176
RCNTAB  020220
RCOUNT  021360
RDCHR = 104402
RDLIN = 104403
RDNTAB  020256
RDOCT = 104404
RECBA   020052
RESREG  006762
RESUM   022246
RESUME  020050
RESVEC= 000010
RES05 = 104407
RFLAG   021310
RFRELD  022356
ROMCLK= 104412
RUN     001500
R6    =%000006
R7    =%000007
SAVACT  001474
SAVNUM  001476
SAVPC   001460
SAVSP   001456
SAV05 = 104406
SCAN    016716
SCAN1   017102
SCAN2   016730
SCOP1 = 104405
SETMAP  022614
SHUTDO  022442
SOFTSW  011466
SPACNT= 006405
STACK = 001200
STAT    001450
STAT1   002050
STAT2   002052
STAT3   002054
STKLMT= 177774
STRTSW  001446
SV05    006074
SWFLG   011432
SWR     001240
SWREG   000176
SW0   = 000001
SW00  = 000001
SW01  = 000002
SW02  = 000004
SW03  = 000010
SW04  = 000020
SW05  = 000040
SW06  = 000100
SW07  = 000200
SW08  = 000400
SW09  = 001000
SW1   = 000002
SW10  = 002000
SW11  = 004000
SW12  = 010000
SW13  = 020000
SW14  = 040000
SW15  = 100000
SW2   = 000004
SW3   = 000010
SW4   = 000020
SW5   = 000040
SW6   = 000100
SW7   = 000200
SW8   = 000400
SW9   = 001000
TBITVE= 000014
TBUF    021314
TBUFF   020110
TCOUNT  021312
TEMP    011122
TFLAG   021306
TIMER = 104414
TKVEC = 000060
TLAST = 016370
TPVEC = 000064
TRAPVE= 000034
TRTVEC= 000014
TST1    013762
TST10   016056
TST11   016156
TST12   016370
TST2    015006
TST3    015200
TST4    015336
TST5    015464
TST6    015622
TST7    015740
TTST    004146
TWOSYN= 010000
TYPDAT  006750
TYPE  = 104401
TYPMSG  006650
VEC     010375
VECMAP  013222
VECTR   013754
VERFY   022544
WHAT    005764
WHERE   006050
WHICH   013214
WRDCNT  006402
WRKO.F  006736
XBX     006536
XCNTAB  020240
XCSR    004104
XDNTAB  020312
XERR    004126
XFRELD  022410
XHEAD   010073
XMITBA  020052
XPASS   004120
XSTATQ  011074
XTSTN   007114
XVEC    004112
X0    = 000110
X1    = 000101
X2    = 000102
X3    = 000103
X4    = 000104
X5    = 000105
X6    = 000106
X7    = 000107
ZERO    001462
$APTHD  002034
$ATYC   004716
$ATY1   004672
$ATY3   004700
$ATY4   004710
$AUTOB  001234
$BASE   001372
$BDADR  001222
$BDDAT  001226
$CDW1   001376
$CDW2   001400
$CHARC  004666
$CMTAG  001200
$CM1  = 000006
$CM2  = 000014
$CM3  = 000006
$CM4  = 000005
$CNTLG  005530
$CNTLU  005523
$CPUOP  001344
$CRAP = 177777
$CRLF   001313
$DDW0   001402
$DDW1   001404
$DDW10  001426
$DDW11  001430
$DDW12  001432
$DDW13  001434
$DDW14  001436
$DDW15  001440
$DDW2   001406
$DDW3   001410
$DDW4   001412
$DDW5   001414
$DDW6   001416
$DDW7   001420
$DDW8   001422
$DDW9   001424
$DEVCT  001326
$DEVM   001374
$DOAGN  004100
$ENDAD  004070
$ENDCT  004054
$ENV    001336
$ENVM   001337
$EOP    003662
$EOPCT  004046
```

```
$ERFLG  001203        $LPADR  001206        $NWTST= 000000        $SVPC - 000040        $TYPEC  004622
$ERMAX  001215        $LPERR  001210        $OVER   004330        $SWR  = 164000        $TYPFX  004670
$ERROR  006506        $MADR1  001350        $PASS   001324        $SWREG  001340        $UNIT   001330
$ERRPC  001216        $MADR2  001354        $PASTM  002042        $SWRMK= 000000        $UNITM  002044
$ERRTB  001512        $MADR3  001360        $PWRDN  007122        $TESTN  001322        $USWR   001342
$ERTTL  001212        $MADR4  001364        $PWRMG  007306        $TIMES  001310        $VEC1   001366
$ETABL  001336        $MAIL   001316        $PWRUP  007174        $TKB    001246        $VECT2  001370
$ETEND  001442        $MAMS1  001346        $QUES   001312        $TKS    001244        $XTSTR  004174
$FATAL  001320        $MAMS2  001352        $RDCHR  005140        $TMP0   001276        $Y    = 000000
$FFLG   005136        $MAMS3  001356        $RDLIN  005260        $TMP1   001300        $$GET4= 000000
$FILLC  001256        $MAMS4  001362        $RDOCT  005560        $TMP2   001302        .     = 034540
$FILLS  001255        $MBADR  002036        $RDSZ = 000007        $TMP3   001304        .ADVAN  006054
$GDADR  001220        $MFLG   005134        $REGAD  001260        $TMP4   001306        .BEGIN  003464
$GDDAT  001224        $MNEW   005546        $REG0   001262        $TN   - 000013        .CNVRT  006164
$GET42  004060        $MSGAD  001332        $REG1   001264        $TPB    001252        .CONVR  006160
$HD   = 000000        $MSGLG  001334        $REG2   001266        $TPFLG  001257        .DATAC  007442
$HIBTS  002034        $MSGTY  001316        $REG3   001270        $TPS    001250        .DELAY  007326
$HIOCT  005716        $MSWR   005535        $REG4   001272        $TRAP   006410        .MSTCL  007356
$ICNT   001204        $MTYP1  001347        $REG5   001274        $TRAP2  006432        .RES05  006126
$ILLUP  007312        $MTYP2  001353        $RTNAD  004102        $TRP  = 000021        .ROMCL  007374
$INPUT  005720        $MTYP3  001357        $S    = 000014        $TRPAD  006444        .SAV05  006066
$INTAG  001235        $MTYP4  001363        $SAVR6  007316        $TSTM   002040        .SCOP1  004360
$ITEMB  001214        $MXCNT  004356        $SCOPE  004134        $TSTNM  001202        .START  002402
$LF     001314        $N    = 000012        $SETUP= 000000        $TTYIN  005514        .TIMER  007506
$LFLG   005135        $NULL   001254        $SVLAD  004316        $TYPE   004410        .$X   - 002034

. ABS.  034540      000

 ERRORS DETECTED:  0

 DSKZ:CZKCGA,DSKZ:CZKCGA/SOL=CZKCGA.MAC,CZKCGA.P11/EQ:DZDMH
 RUN-TIME: 29 18 .7 SECONDS
 RUN-TIME RATIO: 122/48=2.5
 CORE USED:  46K  (91 PAGES)
```