# PDP11

BASIC MICROPROCESSOR TST

MD-11-DZKCC-A

EP-DZKCC-A-DL-A

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FICHE 1 OF 1

AUG 1977

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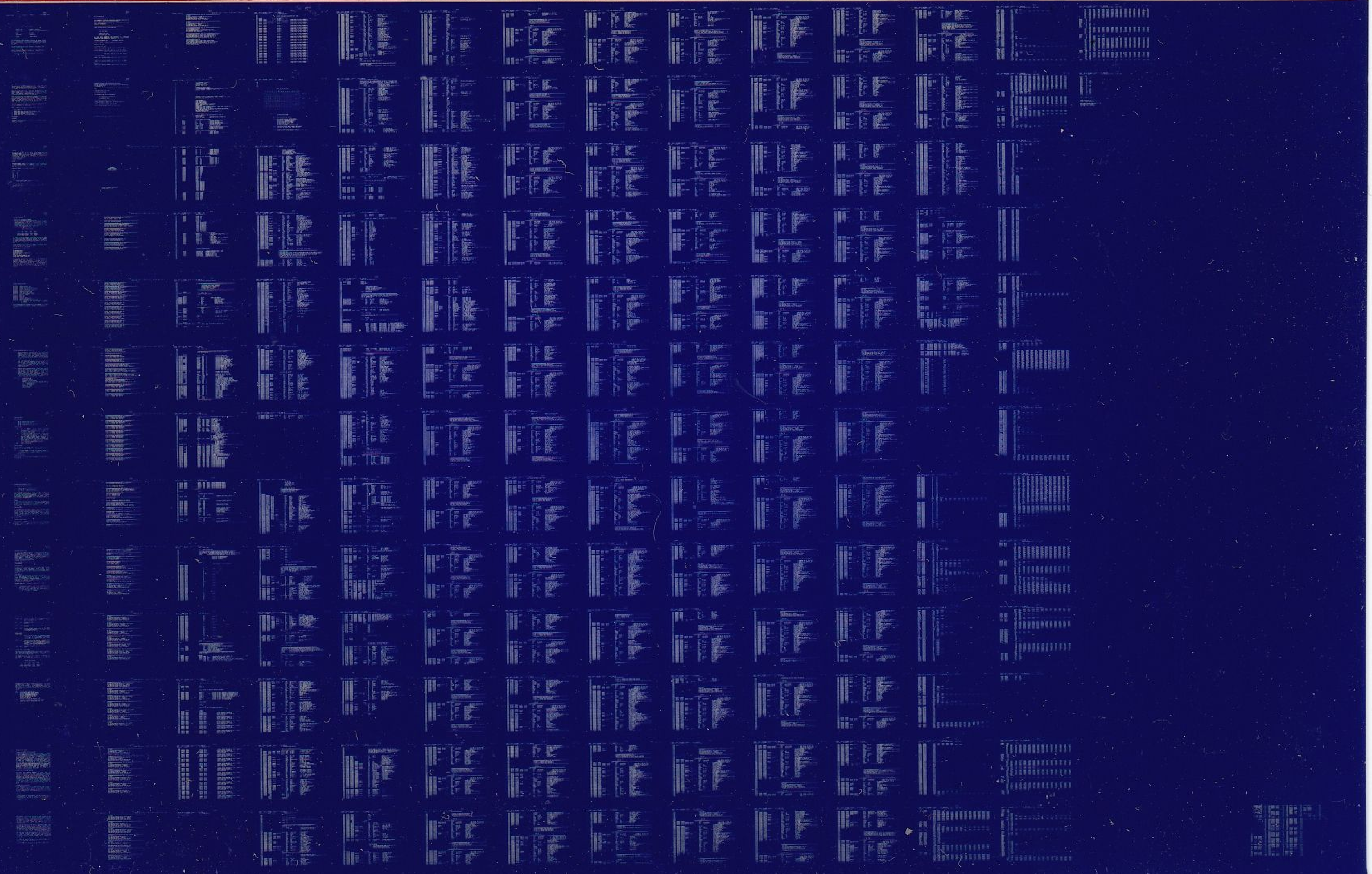
MADE IN USA



IDENTIFICATION

| | |
|---|---|
| PRODUCT CODE: | MAINDEC-11-DZKCC-A-D |
| PRODUCT NAME: | BASIC W/R AND MICRO-PROCESSOR TESTS |
| DATE: | MAY 1977 |
| MAINTAINER: | DIAGNOSTICS |
| AUTHOR: | DINESH GORADIA |

## 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.

DZKCC tests the KMC11 micro-processor ( M8204). It performs write/read tests on the KMC unibus registers, checks the micro-processor operation, checks out Main Memory, scratch pad memory, the ALU functions as well as interrupts and NPR operation. DZKCC performs no tests on the line unit or any CRAM dependent tests. It will run on KMC11's containing CRAM (IOP). It does not require a line unit to run.

Currently there are four 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 four diagnostics are:

1. DZKCC [REV] Basic W/R and Micro-processor tests
2. DZKCD [REV] Jump and memory tests (Heat test tape)
3. DZKCE [REV] DDCMP Line unit tests
4. DZKCF [REV BITSTUFF Line unit tests
5. DZKCA [REV] KMC11 CPU MICRO-DIAGNOSTICS.

## 2. REQUIREMENTS

### 2.1 EQUIPMENT

Any PDP11 family CPU (except an LSI-11) with minimum 8k memory
ASR 33 (or equilivalent)
KMC11-AN IOP (M8204)

## 2.2 STORAGE

Program will use all 8K of memory except where ABL and BOOTSTRAP LOADER reside. Locations 2100 thru 2300; 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 KMC11 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 KMC11 STATUS
                 -------------------

             PC     CSR    STAT1    STAT2    STAT3
             --     ---    -----    -----    -----

           002100 160010 045310   177777   000000
           002110 160020 045320   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. 2100 in the program. In this example the table contains the information and status of two KMC11'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
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 'KMACTV' from the switch register. Using this switch(SW00) alters that location;therefore if four KMC11s 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 KMC11s 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 KMC'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 intermittent 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 '$TSTNM' (address 1202)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 KMC11 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 complelly 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 KMC 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

KMC11 IOP(M8204)- Jumper W1 must be in,

## 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 KMC11's in system are tested. When the diagnostic has completed a pass the following is an example of the print out to be expected.

```
END PASS DZKCC 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 KMC11 since the diagnostic was started are reflected in PASSES: and ERRORS:.

## 8.4 KEY LOCATIONS

| | |
|---|---|
| $LPADR (1206) | Contains the address where program will return when iteration count is reached or if loop on test is asserted. |
| NEXT (1442) | Contains the address of the next test to be peformed. |
| $TSTNM (1202) | Contains the number of the test now being peformed. |
| RUN (1500) | The bit in 'RUN' always points to the KMC11 currently being tested. EXAMPLE: (RUN) 1500/0000000001000000 Means that KMC11 no.06 is the KMC11 now running. |
| KMCR00-KMCR17 KMST00-KMST17 (2100)-(2300) | 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. |
| KMACTV (1306) | Each bit set in this location indicates that the associated KMC11 will be tested in turn. EXAMPLE: (KMACTV) 1470/0000000000011111 means that KMC11 no. 00,01,02,03,04 will be tested. EXAMPLE: (KMACTV) 1470/0000000000010001 Means that KMC11 no. 00,04 will be tested. |
| KMCSR (2066) | Contains the CSR of the current KMC11 under test. |

## 8.4A 'STATUS TABLE' (2100-2300)

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 KMC11'S. the table can contain up to 16 KMC11'S. Following the map is a description of the bits for each map entry

```
                MAP OF KMC11 STATUS
                -------------------

     PC      CSR    STAT1    STAT2    STAT3
     --      ---    -----    -----    -----
   002100  160010  045310   177777   000000
   002110  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, 2100, 2102, 2104, and 2106. The second KMC status is located at 2110, 2112, 2114, and 2116. 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
        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:  NOT USED
```

## 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 a KMC11 has been found, if not, the address is updated by 10 and the search continues. A -1 indicates a KMC11 with no CRAM, and a 125252 indicates a KMC11 with CRAM. 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 KMC11's in the system will be found by the auto-sizer. If it does not find a KMC11 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 KMC is programmed to interrupt. The PS is lowered by 1 until the KMC interrupts, a delay is made and if no interupt occures at PS level 3 (because of a bad KMC11) 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 KMC11 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.

```
APT/ACT/XXDP/SLIDE

+++++++++++++++++++++++++++

THIS DIAGNOSTIC IS APT/ACT/XXDP/SLIDE COMPATIBLE USER WOULD BE
ABLE TO RUN IT UNDER APT/ACT/XXDP ENVIRONMENT.

NOTE:  FOR MANUFACTURING PURPOSE ONLY ITS DESCRIBED HOW TO RUN
UNDER APT ENVIRONMENT.

*****************************************************

ETABLE SETTING FOR APT TO RUN UNDER APT

+++++++++++++++++++++++++++++++++++++++++++++++++++++

        FIRST PASS TIME:

        LONGEST TEST TIME:

        ADDITIONAL TEST TIME:

ALL  THE  ABOVE  PARAMETERS  ARE  DEPENDENT  ON  PARTICULAR
DIAGNOSTICS  AND  SHOULD  BE  LOADED  AT  THE  TIME OF SETTING
ETABLE.THERE IS NO DEFAULT TIME SET UP.

SOFTWARE ENVIRONMENT:001         ENVIRONMENT MODE:200

SWITCH 1:-SHOULD BE USED AS NORMAL SWITCH REGISTER.

SWITCH 2:-NOT USED.

CPU OPTIONS:-NOT USED.

MEMORY TYPE 1:-BITS<2:4>:=BITS <12:14> OF STAT1 OF DEV:0.

MAXIMUM ADDRESS:-BITS<17:19>:=BITS<12:14> OF STAT1 OF DEV:1

                 BITS<2:4>:=BITS <12:14> OF STAT1 OF DEV:2

                 BITS<10:12>:=BITS<12:14> OF STAT1 OF DEV:3

IN THE SAME MANNER

MEMORY TYPE 2 MAXIMUM ADDRESS:-GETS STAT1<12:14> OF DEVICE

4,5,6,7.

MEMORY TYPE 3 MAXIMUM ADDRESS:-GETS STAT1<12:14> OF DEVICE

8,9,10,11.

MEMORY TYPE 4 MAXIMUM ADDRESS:-GETS STAT1<12:14> OF DEVICE

12,13,14,15.
```

```
INTERRUPT VECTOR 1:FIRST DEVICE RECEIVE VECTOR.

REST OF THE DEVICE(KMC'S) VECTOR SHOULD BE SET UP SEQUENTIALLY
IN INCREMENTS OF 10.

BUS PRIORITY:KMC'S PRIORITY(SHOULD BE SAME FOR ALL KMC'S UNDER
TEST).

INTERRUPT VECTOR 2:NOT USED.

BUS PRIORITY:NOT USED.

BASE ADDRESS:FIRST DEVICE CSR ADDRESS.

        REST SHOULD FOLLOW SEQUENTIALLY

        IN INCREMENTS OF 10.

DEVICE MAP:AS DESCRIBED IN APT MANUAL.

CONTROLLER SPECIFIC CODE 1:-NO.  OF DEVICES UNDER TEST.

CONTROLLER SPECIFIC CODE 2:-NOT USED.

DEVICE DESCRIPTOR WORD 0:STAT2 OF FIRST DEVICE.

.  .

.  .

TO

.  .

.  .

DEVICE DESCRIPTOR WORD 15:STAT2 OF 16TH DEVICE.(KMC)
```

DOCUMENT
**************
MAINDEC-11-DZKCC-A
**************

```
2225    *************************** TEST 1 ***************************
        VERIFY THAT REFERENCING UNIBUS DEVICE REGISTERS
        DOES NOT CAUSE A TIME OUT TRAP

2256    *************************** TEST 2 ***************************
        VERIFY THAT RUN CAN BE CLEARED

2275    *************************** TEST 3 ***************************
        UNIBUS REGISTER WORD DUAL ADDRESSING TEST
        LOAD ALL REGISTERS WITH INCREMENTING PATTERN
        READ BACK ALL REGISTERS TO VERIFY CORRECT ADDRESSING

2318    *************************** TEST 4 ***************************
        CONTROL STATUS REGISTER WRITE/READ TEST
        SET BIT0, VERIFY BIT0 WAS SET
        CLEAR BIT0, VERIFY BIT0 WAS CLEARED

2350    *************************** TEST 5 ***************************
        CONTROL STATUS REGISTER WRITE/READ TEST
        SET BIT1, VERIFY BIT1 WAS SET
        CLEAR BIT1, VERIFY BIT1 WAS CLEARED

2382    *************************** TEST 6 ***************************

2383    CONTROL STATUS REGISTER WRITE/READ TEST
        SET BIT2, VERIFY BIT2 WAS SET
        CLEAR BIT2, VERIFY BIT2 WAS CLEARED

2414    *************************** TEST 7 ***************************
        CONTROL STATUS REGISTER WRITE/READ TEST
        SET BIT5, VERIFY BIT5 WAS SET
        CLEAR BIT5, VERIFY BIT5 WAS CLEARED

2446    *************************** TEST 10 ***************************
        CONTROL STATUS REGISTER WRITE/READ TEST
        SET BIT6, VERIFY BIT6 WAS SET
        CLEAR BIT6, VERIFY BIT6 WAS CLEARED
```

```
2478    *************************** TEST 11 ***************************
        CONTROL STATUS REGISTER WRITE/READ TEST
        SET BIT7, VERIFY BIT7 WAS SET
        CLEAR BIT7, VERIFY BIT7 WAS CLEARED

2510    *************************** TEST 12 ***************************
        CONTROL STATUS REGISTER WRITE/READ TEST
        SET BIT9, VERIFY BIT9 WAS SET
        CLEAR BIT9, VERIFY BIT9 WAS CLEARED

2542    *************************** TEST 13 ***************************
        CONTROL STATUS REGISTER WRITE/READ TEST
        SET BIT11, VERIFY BIT11 WAS SET
        CLEAR BIT11, VERIFY BIT11 WAS CLEARED

2574    *************************** TEST 14 ***************************
        CONTROL STATUS REGISTER WRITE/READ TEST
        SET BIT12, VERIFY BIT12 WAS SET
        CLEAR BIT12, VERIFY BIT12 WAS CLEARED

2606    *************************** TEST 15 ***************************

2607    CONTROL OUT REGISTER WRITE/READ TEST
        SET BIT0, VERIFY BIT0 WAS SET
        CLEAR BIT0, VERIFY BIT0 WAS CLEARED

2638    *************************** TEST 16 ***************************
        CONTROL OUT REGISTER WRITE/READ TEST
        SET BIT1, VERIFY BIT1 WAS SET
        CLEAR BIT1, VERIFY BIT1 WAS CLEARED

2670    *************************** TEST 17 ***************************
        CONTROL OUT REGISTER WRITE/READ TEST
        SET BIT2, VERIFY BIT2 WAS SET
        CLEAR BIT2, VERIFY BIT2 WAS CLEARED

2702    *************************** TEST 20 ***************************
        CONTROL OUT REGISTER WRITE/READ TEST
        SET BIT6, VERIFY BIT6 WAS SET
        CLEAR BIT6, VERIFY BIT6 WAS CLEARED

2734    *************************** TEST 21 ***************************
        CONTROL OUT REGISTER WRITE/READ TEST
        SET BIT7, VERIFY BIT7 WAS SET
        CLEAR BIT7, VERIFY BIT7 WAS CLEARED

2766    *************************** TEST 22 ***************************
        CONTROL OUT REGISTER WRITE/READ TEST
        SET BIT12, VERIFY BIT12 WAS SET
        CLEAR BIT12, VERIFY BIT12 WAS CLEARED
```

```
2798    *************************** TEST 23 ***************************
        CONTROL OUT REGISTER WRITE/READ TEST
        SET BIT13, VERIFY BIT13 WAS SET
        CLEAR BIT13, VERIFY BIT13 WAS CLEARED

2830    *************************** TEST 24 ***************************

2831    PORT4 REGISTER WRITE/READ TEST
        FLOAT A ONE THROUGH PORT4 REGISTER
        FLOAT A ZERO THROUGH PORT4 REGISTER

2874    *************************** TEST 25 ***************************
        PORT6 REGISTER WRITE/READ TEST
        FLOAT A ONE THROUGH PORT6 REGISTER
        FLOAT A ZERO THROUGH PORT6 REGISTER

2918    *************************** TEST 26 ***************************
        UNIBUS REGISTER BYTE DUAL ADDRESSING TEST
        LOAD ALL REGISTERS WITH INCREMENTING PATTERN
        READ BACK ALL REGISTERS TO VERIFY CORRECT ADDRESSING

2961    *************************** TEST 27 ***************************
        MAINTENANCE INSTRUCTION REGISTER TEST
        VERIFY THAT THE MAINT IR CAN BE WRITTEN TO ALL ZEROS'
        AND ALL ONES'. VERIFY THAT IT IS CLEARED ON A BUS RESET.

3003    *************************** TEST 30 ***************************
        MAINTENANCE INSTRUCTION REGISTER TEST
        VERIFY THAT THE MAINT IR CAN BE WRITTEN TO ALL ZEROS'
        AND ALL ONES'. VERIFY THAT IT IS CLEARED ON A MASTER RESET.

3045    *************************** TEST 31 ***************************
        MICRO PROCESSOR TEST
        LOAD KMP06 WITH A MICRO-PROCESSOR INSTRUCTION, CLOCK IT
        VERIFY INSTRUCTION EXECUTED PROPERLY
        INSTRUCTION SHOULD MOVE IBUS*4 TO IBUS*5, IBUS*4 IS ALL 1'S
        AND IBUS*5 IS ALL 0'S. RESULT SHOULD BE ALL 1'S IN SEL4

3074    *************************** TEST 32 ***************************
        MICRO PROCESSOR IBUS* REGISTER WRITE/READ TEST
        FLOAT A 1 THROUGH IBUS* REGISTER 0
        FLOAT A 0 THROUGH IBUS* REGISTER 0

3131    *************************** TEST 33 ***************************
        MICRO PROCESSOR IBUS* REGISTER WRITE/READ TEST
        FLOAT A 1 THROUGH IBUS* REGISTER 2
        FLOAT A 0 THROUGH IBUS* REGISTER 2

3188    *************************** TEST 34 ***************************
        MICRO PROCESSOR IBUS* REGISTER WRITE/READ TEST
        FLOAT A 1 THROUGH IBUS* REGISTER 4
        FLOAT A 0 THROUGH IBUS* REGISTER 4
```

```
3241    ************************** TEST 35 **************************
        MICRO PROCESSOR IBUS* REGISTER WRITE/READ TEST
        FLOAT A 1 THROUGH IBUS* REGISTER 5
        FLOAT A 0 THROUGH IBUS* REGISTER 5

3294    ************************** TEST 36 **************************
        MICRO PROCESSOR IBUS* REGISTER WRITE/READ TEST
        FLOAT A 1 THROUGH IBUS* REGISTER 10
        FLOAT A 0 THROUGH IBUS* REGISTER 10

3351    ************************** TEST 37 **************************
        MICRO PROCESSOR IBUS* REGISTER WRITE/READ TEST
        FLOAT A 1 THROUGH IBUS* REGISTER 11
        FLOAT A 0 THROUGH IBUS* REGISTER 11

3410    ************************** TEST 40 **************************
        MICRO PROCESSOR IBUS REGISTER WRITE/READ TEST
        FLOAT A 1 THROUGH IBUS REGISTER 0
        FLOAT A 0 THROUGH IBUS REGISTER 0

3463    ************************** TEST 41 **************************
        MICRO PROCESSOR IBUS REGISTER WRITE/READ TEST
        FLOAT A 1 THROUGH IBUS REGISTER 1
        FLOAT A 0 THROUGH IBUS REGISTER 1

3516    ************************** TEST 42 **************************
        MICRO PROCESSOR IBUS REGISTER WRITE/READ TEST
        FLOAT A 1 THROUGH IBUS REGISTER 2
        FLOAT A 0 THROUGH IBUS REGISTER 2

3569    ************************** TEST 43 **************************
        MICRO PROCESSOR IBUS REGISTER WRITE/READ TEST
        FLOAT A 1 THROUGH IBUS REGISTER 3
        FLOAT A 0 THROUGH IBUS REGISTER 3

3622    ************************** TEST 44 **************************
        MICRO PROCESSOR IBUS REGISTER WRITE/READ TEST
        FLOAT A 1 THROUGH IBUS REGISTER 4
        FLOAT A 0 THROUGH IBUS REGISTER 4

3675    ************************** TEST 45 **************************
        MICRO PROCESSOR IBUS REGISTER WRITE/READ TEST
        FLOAT A 1 THROUGH IBUS REGISTER 5
        FLOAT A 0 THROUGH IBUS REGISTER 5

3728    ************************** TEST 46 **************************
        MICRO PROCESSOR IBUS REGISTER WRITE/READ TEST
        FLOAT A 1 THROUGH IBUS REGISTER 6
        FLOAT A 0 THROUGH IBUS REGISTER 6
```

```
3781    *************************** TEST 47 ***************************
        MICRO PROCESSOR IBUS REGISTER WRITE/READ TEST

3783    FLOAT A 1 THROUGH IBUS REGISTER 7
        FLOAT A 0 THROUGH IBUS REGISTER 7

3834    *************************** TEST 50 ***************************
        MICRO PROCESSOR IBUS DUAL ADDRESS TEST
        WRITE ALL IBUS REGISTERS WITH INCREMENTING PATTERN
        READ ALL IBUS REGISTERS TO VERIFY CORRECT ADDRESSING

3897    *************************** TEST 51 ***************************
        MICRO PROCESSOR BR REGISTER TEST
        FLOAT A 1 THROUGH THE BR
        FLOAT A 0 THROUGH THE BR

3949    *************************** TEST 52 ***************************
        SCRATCH PAD TEST

3951    FLOAT A 1 THROUGH EACH SCRATCH PAD LOCATION
        FLOAT A 0 THROUGH EACH SCRATCH PAD LOCATION

4016    *************************** TEST 53 ***************************
        SCRATCH PAD DUAL ADDRESSING TEST
        WRITE AN INCREMENTING PATTERN IN ALL SP LOCATIONS
        READ ALL SP LOCATIONS TO VERIFY CORRECT ADDRESSING

4077    *************************** TEST 54 ***************************
        INTERRUPT TEST
        TEST THAT DEVICE CAN INTERRUPT TO VECTOR A

4108    *************************** TEST 55 ***************************
        INTERRUPT TEST
        TEST THAT DEVICE CAN INTERRUPT TO VECTOR B

4138    *************************** TEST 56 ***************************
        PRIORITY INTERRUPT TESTS
        SET PS TO ALL BR LEVELS EQUAL OR GREATER THAN
        THE KMC11 LEVEL,VERIFY THAT KMC11 DOES NOT INTERRUPT

4178    *************************** TEST 57 ***************************
        PRIORITY INTERRUPT TESTS
        SET PS TO ALL BR LEVELS LESS THAN THE KMC11 LEVEL
        VERIFY THAT THE KMC11 WILL INTERRUPT

4224    *************************** TEST 60 ***************************
        NPR TEST
        TEST OF DATO, 1 WORD FROM UPROC TO 11 MEMORY
```

```
4259    *************************** TEST 61 ****************************
        NPR TEST
        TEST OF DATI, 1 WORD FROM 11 MEMORY TO UPROC

4297    *************************** TEST 62 ****************************
        NPR TEST
        TEST OF DATOB, 1 BYTE FROM UPROC TO 11 MEMORY

4331    *************************** TEST 63 ****************************
        TEST OF EA BITS 16 AND 17
        DO A DATO TO AN ADDRESS USING OUT BA BITS 16 AND 17
        VERIFY CORRECT RESULTS

4372    *************************** TEST 64 ****************************
        TEST OF EA BITS 16 AND 17
        DO A DATI USING IN BA BITS 16 AND 17
        VERIFY CORRECT RESULTS

4410    *************************** TEST 65 ****************************
        NPR NON-EXISTENT MEMORY TEST
        DO A DATO TO A NON-EXISTENT ADDRESS
        VERIFY THAT THE NON-EXISTENT BIT SET IN IBUS REG 11

4447    *************************** TEST 66 ****************************
        NPR NON-EXISTENT MEMORY TEST
        DO A DATI FROM A NON-EXISTENT ADDRESS
        VERIFY THAT THE NON-EXISTENT BIT SET IN IBUS REG 11

4484    *************************** TEST 67 ****************************
        NPR TEST
        USING DATO, NPR A BINARY COUNT (0-377 )
        FROM MICRO-PROCESSOR TO ALL AVAILABLE MEMORY

4546    *************************** TEST 70 ****************************
        ALU C BIT TEST
        TEST THAT AN ADD OF 377 AND 377 WILL SET THE C BIT

4586    *************************** TEST 71 ****************************
        ALU TEST
        TEST OF ALU FUNCTION SEL B WITH C BIT CLEARED
        ALU FUNCTION (B)     CODE=11
        LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
        PERFORM THE FUNCTION, VERIFY THE RESULTS

4637    *************************** TEST 72 ****************************
        ALU TEST
        TEST OF ALU FUNCTION SEL A WITH C BIT CLEARED
        ALU FUNCTION (A)     CODE=10
        LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
        PERFORM THE FUNCTION, VERIFY THE RESULTS
```

```
4688        **************************** TEST 73 ****************************
            ALU TEST
            TEST OF ALU FUNCTION A OR NOTB WITH C BIT CLEARED
            ALU FUNCTION (A OR NOTB)    CODE=12
            LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
            PERFORM THE FUNCTION, VERIFY THE RESULTS

4739        **************************** TEST 74 ****************************
            ALU TEST
            TEST OF ALU FUNCTION A AND B WITH C BIT CLEARED
            ALU FUNCTION (A AND B)    CODE=13
            LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
            PERFORM THE FUNCTION, VERIFY THE RESULTS

4790        **************************** TEST 75 ****************************

4791        ALU TEST
            TEST OF ALU FUNCTION A OR B WITH C BIT CLEARED
            ALU FUNCTION (A OR B)    CODE=14
            LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
            PERFORM THE FUNCTION, VERIFY THE RESULTS

4841        **************************** TEST 76 ****************************
            ALU TEST
            TEST OF ALU FUNCTION A XOR B WITH C BIT CLEARED
            ALU FUNCTION (A XOR B)    CODE=15
            LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
            PERFORM THE FUNCTION, VERIFY THE RESULTS

4892        **************************** TEST 77 ****************************
            ALU TEST
            TEST OF ALU FUNCTION ADD WITH C BIT CLEARED
            ALU FUNCTION (A PLUS B)    CODE=00
            LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
            PERFORM THE FUNCTION, VERIFY THE RESULTS

4943        **************************** TEST 100 ****************************
            ALU TEST
            TEST OF ALU FUNCTION 2A W/C WITH C BIT CLEARED
            ALU FUNCTION (A PLUS A PLUS C)    CODE=6
            LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
            PERFORM THE FUNCTION, VERIFY THE RESULTS

4994        **************************** TEST 101 ****************************
            ALU TEST
            TEST OF ALU FUNCTION SUB WITH C BIT CLEARED
            ALU FUNCTION (A-B)    CODE=16
            LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
            PERFORM THE FUNCTION, VERIFY THE RESULTS
```

```
5045     ************************** TEST 102 **************************
         ALU TEST
         TEST OF ALU FUNCTION ADD W/C WITH C BIT CLEARED
         ALU FUNCTION (A PLUS B PLUS C)    CODE=01
         LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
         PERFORM THE FUNCTION, VERIFY THE RESULTS

5096     ************************** TEST 103 **************************
         ALU TEST
         TEST OF ALU FUNCTION SUB W/C WITH C BIT CLEARED
         ALU FUNCTION (A-B-C)    CODE=2
         LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
         PERFORM THE FUNCTION, VERIFY THE RESULTS

5147     ************************** TEST 104 **************************
         ALU TEST
         TEST OF ALU FUNCTION INC A WITH C BIT CLEARED
         ALU FUNCTION (A PLUS 1)    CODE=3
         LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
         PERFORM THE FUNCTION, VERIFY THE RESULTS

5198     ************************** TEST 105 **************************
         ALU TEST
         TEST OF ALU FUNCTION 2A WITH C BIT CLEARED
         ALU FUNCTION (A PLUS A)    CODE=5
         LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
         PERFORM THE FUNCTION, VERIFY THE RESULTS

5249     ************************** TEST 106 **************************
         ALU TEST
         TEST OF ALU FUNCTION A PLUS C WITH C BIT CLEARED
         ALU FUNCTION (A PLUS C)    CODE=4
         LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
         PERFORM THE FUNCTION, VERIFY THE RESULTS

5300     ************************** TEST 107 **************************
         ALU TEST
         TEST OF ALU FUNCTION 2'S COMP SUB WITH C BIT CLEARED
         ALU FUNCTION (A-B-1)    CODE=17
         LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
         PERFORM THE FUNCTION, VERIFY THE RESULTS

5351     ************************** TEST 110 **************************
         ALU TEST
         TEST OF ALU FUNCTION DEC A WITH C BIT CLEARED
         ALU FUNCTION (A-1)    CODE=7
         LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
         PERFORM THE FUNCTION, VERIFY THE RESULTS
```

```
5402    *************************** TEST 111 ***************************
        ALU TEST
        TEST OF ALU FUNCTION SEL B WITH C BIT SET
        ALU FUNCTION (B)     CODE=11
        LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA

5407    PERFORM THE FUNCTION, VERIFY THE RESULTS

5453    *************************** TEST 112 ***************************
        ALU TEST
        TEST OF ALU FUNCTION SEL A WITH C BIT SET
        ALU FUNCTION (A)     CODE=10
        LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
        PERFORM THE FUNCTION, VERIFY THE RESULTS

5504    *************************** TEST 113 ***************************
        ALU TEST
        TEST OF ALU FUNCTION A OR NOTB WITH C BIT SET
        ALU FUNCTION (A OR NOTB)     CODE=12
        LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
        PERFORM THE FUNCTION, VERIFY THE RESULTS

5555    *************************** TEST 114 ***************************
        ALU TEST
        TEST OF ALU FUNCTION A AND B WITH C BIT SET
        ALU FUNCTION (A AND B)     CODE=13
        LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
        PERFORM THE FUNCTION, VERIFY THE RESULTS

5606    *************************** TEST 115 ***************************
        ALU TEST
        TEST OF ALU FUNCTION A OR B WITH C BIT SET
        ALU FUNCTION (A OR B)     CODE=14
        LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
        PERFORM THE FUNCTION, VERIFY THE RESULTS

5657    *************************** TEST 116 ***************************
        ALU TEST
        TEST OF ALU FUNCTION A XOR B WITH C BIT SET
        ALU FUNCTION (A XOR B)     CODE=15
        LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
        PERFORM THE FUNCTION, VERIFY THE RESULTS

5708    *************************** TEST 117 ***************************
        ALU TEST
        TEST OF ALU FUNCTION ADD WITH C BIT SET
        ALU FUNCTION (A PLUS B)     CODE=00
        LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
        PERFORM THE FUNCTION, VERIFY THE RESULTS
```

```
5759    ************************* TEST 120 *************************
        ALU TEST
        TEST OF ALU FUNCTION 2A W/C WITH C BIT SET
        ALU FUNCTION (A PLUS A PLUS C)     CODE=6
        LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
        PERFORM THE FUNCTION, VERIFY THE RESULTS

5810    ************************* TEST 121 *************************
        ALU TEST
        TEST OF ALU FUNCTION SUB WITH C BIT SET
        ALU FUNCTION (A-B)    CODE=16
        LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
        PERFORM THE FUNCTION, VERIFY THE RESULTS

5861    ************************* TEST 122 *************************
        ALU TEST
        TEST OF ALU FUNCTION ADD W/C WITH C BIT SET
        ALU FUNCTION (A PLUS B PLUS C)     CODE=01
        LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
        PERFORM THE FUNCTION, VERIFY THE RESULTS

5912    ************************* TEST 123 *************************
        ALU TEST
        TEST OF ALU FUNCTION SUB W/C WITH C BIT SET
        ALU FUNCTION (A-B-C)     CODE=2
        LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
        PERFORM THE FUNCTION, VERIFY THE RESULTS

5963    ************************* TEST 124 *************************
        ALU TEST
        TEST OF ALU FUNCTION INC A WITH C BIT SET
        ALU FUNCTION (A PLUS 1)     CODE=3

5967    LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
        PERFORM THE FUNCTION, VERIFY THE RESULTS

6014    ************************* TEST 125 *************************
        ALU TEST
        TEST OF ALU FUNCTION 2A WITH C BIT SET
        ALU FUNCTION (A PLUS A)     CODE=5
        LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
        PERFORM THE FUNCTION, VERIFY THE RESULTS

6065    ************************* TEST 126 *************************
        ALU TEST
        TEST OF ALU FUNCTION A PLUS C WITH C BIT SET
        ALU FUNCTION (A PLUS C)     CODE=4
        LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
        PERFORM THE FUNCTION, VERIFY THE RESULTS
```

```
6116            ************************** TEST 127 ***************************
                ALU TEST
                TEST OF ALU FUNCTION 2'S COMP SUB WITH C BIT SET
                ALU FUNCTION (A-B-1)     CODE=17
                LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                PERFORM THE FUNCTION, VERIFY THE RESULTS

6167            ************************** TEST 130 ***************************
                ALU TEST
                TEST OF ALU FUNCTION DEC A WITH C BIT SET
                ALU FUNCTION (A-1)     CODE=7
                LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                PERFORM THE FUNCTION, VERIFY THE RESULTS

6218            ************************** TEST 131 ***************************
                TEST OF PROGRAM CLOCK BIT
                DO A MASTER CLEAR, VERIFY THAT PROGRAM CLOCK IS SET
                WRITE PROGRAM CLOCK BIT TO A ONE, VERIFY THAT IT CLEARS,
                AND THEN SETS SOME TIME LATER

6269            ************************** TEST 132 ***************************
                FORCE POWER FAIL TEST
                SET FORCE POWER FAIL BIT VERIFY THAT PROCESSOR TRAPS TO 24
                GOING DOWN AND COMING UP. VERIFY ALSO THAT BUS INIT WAS
                BLOCKED FROM GETTING TO THE KMC DURING THE POWER FAIL

6317            ************************** TEST 133 ***************************
                MICRO-PROCESSOR NOISE TEST
                WRITE ALL ZERO'S THEN ALL ONE'S THEN A DATA PATTERN
                TO THE IBUS* AND IBUS REGISTERS AND TO THE SP AND MAIN MEM
                THEN GO BACK AND READ THE DATA PATERNS  TO VERIFY THAT
                READING AND WRITING OF OTHER LOCATIONS AND REGISTERS
                DID NOT CHANGE THE DATA.
```

```
                        .TITLE  MAINDEC-11-DZKCC-A
                        ;*COPYRIGHT (C) 1976
                        ;*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.
                        ;*





                        ;*MAINDEC-11-DZKCC-A   BASIC KMC11 CONTROLLER TEST
                        ;*COPYRIGHT 1976, 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 "MAINDEC-11-DZKCC-A   BASIC KMC11 CONTROLLER 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
```

```
    57          000003              R3=     %3              ;;GENERAL REGISTER
    58          000004              R4=     %4              ;;GENERAL REGISTER
    59          000005              R5=     %5              ;;GENERAL REGISTER
    60          000006              R6=     %6              ;;GENERAL REGISTER
    61          000007              R7=     %7              ;;GENERAL REGISTER
    62          000006              SP=     %6              ;;STACK POINTER
    63          000007              PC=     %7              ;;PROGRAM COUNTER
    64
    65                              ;*PRIORITY LEVEL DEFINITIONS
    66          000000              PR0=    0               ;;PRIORITY LEVEL 0
    67          000040              PR1=    40              ;;PRIORITY LEVEL 1
    68          000100              PR2=    100             ;;PRIORITY LEVEL 2
    69          000140              PR3=    140             ;;PRIORITY LEVEL 3
    70          000200              PR4=    200             ;;PRIORITY LEVEL 4
    71          000240              PR5=    240             ;;PRIORITY LEVEL 5
    72          000300              PR6=    300             ;;PRIORITY LEVEL 6
    73          000340              PR7=    340             ;;PRIORITY LEVEL 7
    74
    75                              ;*"SWITCH REGISTER" SWITCH DEFINITIONS
    76          100000              SW15=   100000
    77          040000              SW14=   40000
    78          020000              SW13=   20000
    79          010000              SW12=   10000
    80          004000              SW11=   4000
    81          002000              SW10=   2000
    82          001000              SW09=   1000
    83          000400              SW08=   400
    84          000200              SW07=   200
    85          000100              SW06=   100
    86          000040              SW05=   40
    87          000020              SW04=   20
    88          000010              SW03=   10
    89          000004              SW02=   4
    90          000002              SW01=   2
    91          000001              SW00=   1
    92                              .EQUIV  SW09,SW9
    93                              .EQUIV  SW08,SW8
    94                              .EQUIV  SW07,SW7
    95                              .EQUIV  SW06,SW6
    96                              .EQUIV  SW05,SW5
    97                              .EQUIV  SW04,SW4
    98                              .EQUIV  SW03,SW3
    99                              .EQUIV  SW02,SW2
   100                              .EQUIV  SW01,SW1
   101                              .EQUIV  SW00,SW0
   102
   103                              ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
   104          100000              BIT15=  100000
   105          040000              BIT14=  40000
   106          020000              BIT13=  20000
   107          010000              BIT12=  10000
   108          004000              BIT11=  4000
   109          002000              BIT10=  2000
   110          001000              BIT09=  1000
   111          000400              BIT08=  400
   112          000200              BIT07=  200
```

```
        000100          BIT06=  100
        000040          BIT05=  40
        000020          BIT04=  20
        000010          BIT03=  10
        000004          BIT02=  4
        000002          BIT01=  2
        000001          BIT00=  1
                        .EQUIV  BIT09,BIT9
                        .EQUIV  BIT08,BIT8
                        .EQUIV  BIT07,BIT7
                        .EQUIV  BIT06,BIT6
                        .EQUIV  BIT05,BIT5
                        .EQUIV  BIT04,BIT4
                        .EQUIV  BIT03,BIT3
                        .EQUIV  BIT02,BIT2
                        .EQUIV  BIT01,BIT1
                        .EQUIV  BIT00,BIT0

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




                        ;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   007126                             $PWRDN                    ;POWER FAIL HANDLER
 000026   000340                             PR7                       ;SERVICE AT LEVEL 7
 000030   006512                             $ERROR                    ;ERROR HANDLER
 000032   000340                             PR7                       ;SERVICE AT LEVEL 7
 000034   006414                             $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   040515   047111  MTITLE: .ASCII   <200><12>/MAINDEC-11-DZKCC-A/<200>
 001025      102   051501   041511          .ASCIZ   /BASIC KMC11 CONTROLLER TEST/<200>

          177570                    DSWR     =        177570
          177570                    DDISP    =        177570
```

G03

```
                               .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
```

```

                                ;;************************************************************************
                                .EVEN
 001316                         $MAIL:                          ;;APT MAILBOX
 001316  000000                 $MSGTY: .WORD   AMSGTY          ;;MESSAGE TYPE CODE
 001320  000000                 $FATAL: .WORD   AFATAL          ;;FATAL ERROR NUMBER
 001322  000000                 $TESTN: .WORD   ATESTN          ;;TEST NUMBER
 001324  000000                 $PASS:  .WORD   APASS           ;;PASS COUNT
 001326  000000                 $DEVCT: .WORD   ADEVCT          ;;DEVICE COUNT
 001330  000000                 $UNIT:  .WORD   AUNIT           ;;I/O UNIT NUMBER
 001332  000000                 $MSGAD: .WORD   AMSGAD          ;;MESSAGE ADDRESS
 001334  000000                 $MSGLG: .WORD   AMSGLG          ;;MESSAGE LENGTH
 001336                         $ETABLE:                        ;;APT ENVIRONMENT TABLE
 001336     002                 $ENV:   .BYTE   AENV            ;;ENVIRONMENT BYTE
 001337     000                 $ENVM:  .BYTE   AENVM           ;;ENVIRONMENT MODE BITS
 001340  000000                 $SWREG: .WORD   ASWREG          ;;APT SWITCH REGISTER
 001342  000000                 $USWR:  .WORD   AUSWR           ;;USER SWITCHES
 001344  000000                 $CPUOP: .WORD   ACPUOP          ;;CPU TYPE,OPTIONS
                                ;*                              BITS 15-11=CPU TYPE
                                ;*                                      11/04=01,11/05=02,11/20=03,11/40=04,11/45=05
                                ;*                                      11/70=06,PDQ=07,Q=10
                                ;*                              BIT 10=REAL TIME CLOCK
                                ;*                              BIT  9=FLOATING POINT PROCESSOR
                                ;*                              BIT  8=MEMORY MANAGEMENT
 001346     000                 $MAMS1: .BYTE   AMAMS1          ;;HIGH ADDRESS,M.S. BYTE
 001347     000                 $MTYP1: .BYTE   AMTYP1          ;;MEM. TYPE,BLK#1
                                ;*                              MEM.TYPE BYTE   --  (HIGH BYTE)
                                ;*                                      900 NSEC CORE=001
                                ;*                                      300 NSEC BIPOLAR=002
                                ;*                                      500 NSEC MOS=003
 001350  000000                 $MADR1: .WORD   AMADR1          ;;HIGH ADDRESS,BLK#1
                                ;*                              MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF "TYPE" ABOVE
 001352     000                 $MAMS2: .BYTE   AMAMS2          ;;HIGH ADDRESS,M.S. BYTE
 001353     000                 $MTYP2: .BYTE   AMTYP2          ;;MEM.TYPE,BLK#2
 001354  000000                 $MADR2: .WORD   AMADR2          ;;MEM.LAST ADDRESS,BLK#2
 001356     000                 $MAMS3: .BYTE   AMAMS3          ;;HIGH ADDRESS,M.S.BYTE
 001357     000                 $MTYP3: .BYTE   AMTYP3          ;;MEM.TYPE,BLK#3
 001360  000000                 $MADR3: .WORD   AMADR3          ;;MEM.LAST ADDRESS,BLK#3
 001362     000                 $MAMS4: .BYTE   AMAMS4          ;;HIGH ADDRESS,M.S.BYTE
 001363     000                 $MTYP4: .BYTE   AMTYP4          ;;MEM.TYPE,BLK#4
 001364  000000                 $MADR4: .WORD   AMADR4          ;;MEM.LAST ADDRESS,BLK#4
 001366  000000                 $VECT1: .WORD   AVECT1          ;;INTERRUPT VECTOR#1,BUS PRIORITY#1
 001370  000000                 $VECT2: .WORD   AVECT2          ;;INTERRUPT VECTOR#2BUS PRIORITY#2
 001372  000000                 $BASE:  .WORD   ABASE           ;;BASE ADDRESS OF EQUIPMENT UNDER TEST
 001374  000000                 $DEVM:  .WORD   ADEVM           ;;DEVICE MAP
 001376  000000                 $CDW1:  .WORD   ACDW1           ;;CONTROLLER DESCRIPTION WORD#1
 001400  000000                 $CDW2:  .WORD   ACDW2           ;;CONTROLLER DESCRIPTION WORD#2
 001402  000000                 $DDW0:  .WORD   ADDW0           ;;DEVICE DESCRIPTOR WORD#0
 001404  000000                 $DDW1:  .WORD   ADDW1           ;;DEVICE DESCRIPTOR WORD#1
 001406  000000                 $DDW2:  .WORD   ADDW2           ;;DEVICE DESCRIPTOR WORD#2
 001410  000000                 $DDW3:  .WORD   ADDW3           ;;DEVICE DESCRIPTOR WORD#3
 001412  000000                 $DDW4:  .WORD   ADDW4           ;;DEVICE DESCRIPTOR WORD#4
 001414  000000                 $DDW5:  .WORD   ADDW5           ;;DEVICE DESCRIPTOR WORD#5
 001416  000000                 $DDW6:  .WORD   ADDW6           ;;DEVICE DESCRIPTOR WORD#6
 001420  000000                 $DDW7:  .WORD   ADDW7           ;;DEVICE DESCRIPTOR WORD#7
 001422  000000                 $DDW8:  .WORD   ADDW8           ;;DEVICE DESCRIPTOR WORD#8
```

```
001424  000000          $DDW9:  .WORD   ADDW9   ;;DEVICE DESCRIPTOR WORD#9
001426  000000          $DDW10: .WORD   ADDW10  ;;DEVICE DESCRIPTOR WORD#10
001430  000000          $DDW11: .WORD   ADDW11  ;;DEVICE DESCRIPTOR WORD#11
001432  000000          $DDW12: .WORD   ADDW12  ;;DEVICE DESCRIPTOR WORD#12
001434  000000          $DDW13: .WORD   ADDW13  ;;DEVICE DESCRIPTOR WORD#13
001436  000000          $DDW14: .WORD   ADDW14  ;;DEVICE DESCRIPTOR WORD#14
001440  000000          $DDW15: .WORD   ADDW15  ;;DEVICE DESCRIPTOR WORD#15


001442                  $ETEND:

                        ;
                        ;   PROGRAM CONTROL PARAMETERS
                        ;-----------------------------------
001442  000000          NEXT:   .WORD   0               ; ADDRSS OF NEXT TEST TO BE EXECUTED
001444  000000          LOCK:   .WORD   0               ; ADDRESS FOR LOCK CURRENT DATA
                        ;
                        ;    PROGRAM VARIABLES
                        ;-----------------------
001446  000000          STRTSW: .WORD   0               ; SWITCHES AT START OF PROGRAM
001450  000000          STAT:   .WORD   0               ; KM STATUS WORD STORAGE
001452  000000          CLKX:   .WORD   0               ;
001454  000000          MASKX:  .WORD   0               ;
001456  000000          SAVSP:  .WORD   0               ; STACK POINTER STORAGE
001460  000000          SAVPC:  .WORD   0               ; PROGRAM COUNTER STORAGE
001462  000000          ZERO:   .WORD   0               ;
001464  000001          ONE:    .WORD   1               ;
001466  000000          MEMLIM: .WORD   0               ; HIGHEST LOCATION FOR NPR'S
001470  000001          KMACTV: .BLKW   1               ; KMC11 SELECTED ACTIVE
001472  000001          KMNUM:  .BLKW   1               ; OCTAL NUMBER OF KMC11'S
001474  000001          SAVACT: .BLKW   1               ; ORIGINAL ACTIVE DEVICES.
001476  000001          SAVNUM: .BLKW   1               ; WORKABLE NUMBER.
001500  000000          RUN:    .WORD   0               ; POINTER TO RUNNING DEVICES
                                .EVEN
001502  002072          CREAM:  .WORD   KM.MAP-6        ; TABLE POINTER
001504  002276          MILK:   .WORD   CNT.MAP-4       ; TABLE POINTER
                        ;
                        ;   PROGRAM CONTROL FLAGS
                        ;-----------------------
001506     000          INIFLG: .BYTE   0               ; PROGRAM INITIALIZING FLAG
        001510                  .EVEN
001510     000          LOKFLG: .BYTE   0               ; LOCK ON CURRENT TEST FLAG
001511     000          QV.FLG: .BYTE   0               ; QUICK VERIFY FLAG
                                                        ; ON FIRST PASS OF EACH KMC11 ITERATIONS WILL BE SUPPRES
                                .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  035746                        EM1
001522  036632                        DH1               ; ERROR 1
001524  037112                        DT1
001526  036013                        EM2
001530  036673                        DH2               ; ERROR 2
001532  037124                        DT2
001534  036054                        EM3
001536  036731                        DH3               ; ERROR 3
001540  037142                        DT3
001542  036102                        EM4
001544  036752                        DH4               ; ERROR 4
001546  037154                        DT4
001550  036102                        EM4
001552  037014                        DH5               ; ERROR 5
001554  037172                        DT5
001556  036143                        EM5
001560  036731                        DH3               ; ERROR 6
001562  037210                        DT6
001564  036165                        EM6
001566  037055                        DH6               ; ERROR 7
001570  037172                        DT5
001572  036207                        EM7
001574  000000                        0                 ; ERROR 10
001576  000000                        0
001600  036243                        EM10
001602  000000                        0                 ; ERROR 11
001604  000000                        0
001606  036307                        EM11
001610  036731                        DH3               ; ERROR 12
001612  037142                        DT3
001614  036321                        EM12
001616  037055                        DH6               ; ERROR 13
001620  037172                        DT5
001622  036343                        EM13
001624  037055                        DH6               ; ERROR 14
001626  037172                        DT5
```

```
001630  036355                    EM14
001632  036731                    DH3                 ; ERROR 15
001634  037210                    DT6
001636  036367                    EM15
001640  036752                    DH4                 ; ERROR 16
001642  037154                    DT4
001644  036413                    EM16
001646  000000                    0                   ; ERROR 17
001650  000000                    0
001652  036443                    EM17
001654  000000                    0                   ; ERROR  20
001656  000000                    0
001660  036307                    EM11
001662  037055                    DH6                 ; ERROR 21
001664  037172                    DT5
001666  036471                    EM20
001670  036731                    DH3                 ; ERROR 22
001672  037222                    DT7
001674  036524                    EM21
001676  036731                    DH3                 ; ERROR 23
001700  037142                    DT3
001702  036471                    EM20
001704  000000                    0                   ; ERROR 24
001706  000000                    0
001710  036573                    EM22
001712  036731                    DH3                 ; ERROR 25
001714  037142                    DT3
        002034            .=2034
                          .SBTTL  APT PARAMETER BLOCK

                          ;;*****************************************************************
                          ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
                          ;;*****************************************************************
        002034                    .$X=.     ;;SAVE CURRENT LOCATION
        000024                    .=24      ;;SET POWER FAIL TO POINT TO START OF PROGRAM
000024  000200                    200       ;;FOR APT START UP
        000044                    .=44      ;;POINT TO APT INDIRECT ADDRESS PNTR.
000044  002034                    $APTHDR   ;;POINT TO APT HEADER BLOCK
        002034                    .=.$X     ;;RESET LOCATION COUNTER
                          ;;*****************************************************************
                          ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
                          ;INTERFACE SPEC.

002034                    $APTHD:
002034  000000            $HIBTS:  .WORD    0       ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
002036  001316            $MBADR:  .WORD    $MAIL   ;;ADDRESS OF APT MAILBOX (BITS 0-15)
002040  000132            $TSTM:   .WORD    90.     ;;RUN TIM OF LONGEST TEST
002042  000137            $PASTM:  .WORD    95.     ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
002044  000137            $UNITM:  .WORD    95.     ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
002046  000052                   .WORD    $ETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)
```

```

                           ;KMC11 CONTROL INDICATORS FOR CURRENT KMC11 UNDER TEST
                           ;---------------------------------------------------

 002050  000000            STAT1:  0
 002052  000000            STAT2:  0
 002054  000000            STAT3:  0

                           ;KMC11 VECTOR AND REGISTER INDIRECT POINTERS
                           ;------------------------------------------

 002056  000000            KMRVEC: 0                ;POINTER TO KMC11 RECEIVER INTERRUPT VECTOR
 002060  000000            KMRLVL: 0                ;POINTER TO KMC11 RECEIVER INTERRUPT SERVICE PS
 002062  000000            KMTVEC: 0                ;POINTER TO KMC11 TRANSMITTER INTERRUPT VECTOR
 002064  000000            KMTLVL: 0                ;POINTER TO KMC11 TRANSMITTER INTERRUPT SERVICE PS
 002066  000000            KMCSR:  0                ;POINTER TO KMC11 CONTROL STATUS REGISTER
 002070  000000            KMCSRH: 0                ;POINTER TO KMC11 CONTROL STATUS REGISTER HIGH BYTE.
 002072  000000            KMCTL:  0                ;POINTER TO KMC11 CONTOL OUT REGISTER
 002074  000000            KMP04:  0                ;POINTER TO KMC11 PORT REGISTER(SEL 4)
 002076  000000            KMP06:  0                ;POINTER TO KMC11 PORT REGISTER(SEL 6)

                           ;TEMP STORAGE
                           ;------------

                           ;TEMP:  0
                           ;.=.+40

                           ;KMC11 STATUS TABLE AND ADDRESS ASSIGNMENTS
                           ;-----------------------------------------

         002100            .=2100
 002100                    KM.MAP:
 002100  000001            KMCR00: .BLKW   1                ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 00
 002102  000001            KMS100: .BLKW   1                ;VECTOR FOR KMC11 NUMBER 00
 002104  000001            KMS200: .BLKW   1                ;DDCMP LINE# FOR KMC11 NUMBER 00
 002106  000001            KMS300: .BLKW   1                ;3RD STATUS WORD

 002110  000001            KMCR01: .BLKW   1                ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 01
 002112  000001            KMS101: .BLKW   1                ;VECTOR FOR KMC11 NUMBER 01
 002114  000001            KMS201: .BLKW   1                ;DDCMP LINE# FOR KMC11 NUMBER 01
 002116  000001            KMS301: .BLKW   1                ;3RD STATUS WORD

 002120  000001            KMCR02: .BLKW   1                ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 02
 002122  000001            KMS102: .BLKW   1                ;VECTOR FOR KMC11 NUMBER 02
 002124  000001            KMS202: .BLKW   1                ;DDCMP LINE# FOR KMC11 NUMBER 02
 002126  000001            KMS302: .BLKW   1                ;3RD STATUS WORD

 002130  000001            KMCR03: .BLKW   1                ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 03
 002132  000001            KMS103: .BLKW   1                ;VECTOR FOR KMC11 NUMBER 03
 002134  000001            KMS203: .BLKW   1                ;DDCMP LINE# FOR KMC11 NUMBER 03
 002136  000001            KMS303: .BLKW   1                ;3RD STATUS WORD

 002140  000001            KMCR04: .BLKW   1                ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 04
 002142  000001            KMS104: .BLKW   1                ;VECTOR FOR KMC11 NUMBER 04
 002144  000001            KMS204: .BLKW   1                ;DDCMP LINE# FOR KMC11 NUMBER 04
 002146  000001            KMS304: .BLKW   1                ;3RD STATUS WORD
 002150  000001          KMCR05: .BLKW   1               ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 05
 002152  000001          KMS105: .BLKW   1               ;VECTOR FOR KMC11 NUMBER 05
 002154  000001          KMS205: .BLKW   1               ;DDCMP LINE# FOR KMC11 NUMBER 05
 002156  000001          KMS305: .BLKW   1               ;3RD STATUS WORD

 002160  000001          KMCR06: .BLKW   1               ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 06
 002162  000001          KMS106: .BLKW   1               ;VECTOR FOR KMC11 NUMBER 06
 002164  000001          KMS206: .BLKW   1               ;DDCMP LINE# FOR KMC11 NUMBER 06
 002166  000001          KMS306: .BLKW   1               ;3RD STATUS WORD

 002170  000001          KMCR07: .BLKW   1               ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 07
 002172  000001          KMS107: .BLKW   1               ;VECTOR FOR KMC11 NUMBER 07
 002174  000001          KMS207: .BLKW   1               ;DDCMP LINE# FOR KMC11 NUMBER 07
 002176  000001          KMS307: .BLKW   1               ;3RD STATUS WORD

 002200  000001          KMCR10: .BLKW   1               ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 10
 002202  000001          KMS110: .BLKW   1               ;VECTOR FOR KMC11 NUMBER 10
 002204  000001          KMS210: .BLKW   1               ;DDCMP LINE# FOR KMC11 NUMBER 10
 002206  000001          KMS310: .BLKW   1               ;3RD STATUS WORD

 002210  000001          KMCR11: .BLKW   1               ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 11
 002212  000001          KMS111: .BLKW   1               ;VECTOR FOR KMC11 NUMBER 11
 002214  000001          KMS211: .BLKW   1               ;DDCMP LINE# FOR KMC11 NUMBER 11
 002216  000001          KMS311: .BLKW   1               ;3RD STATUS WORD

 002220  000001          KMCR12: .BLKW   1               ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 12
 002222  000001          KMS112: .BLKW   1               ;VECTOR FOR KMC11 NUMBER 12
 002224  000001          KMS212: .BLKW   1               ;DDCMP LINE# FOR KMC11 NUMBER 12
 002226  000001          KMS312: .BLKW   1               ;3RD STATUS WORD

 002230  000001          KMCR13: .BLKW   1               ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 13
 002232  000001          KMS113: .BLKW   1               ;VECTOR FOR KMC11 NUMBER 13
 002234  000001          KMS213: .BLKW   1               ;DDCMP LINE# FOR KMC11 NUMBER 13
 002236  000001          KMS313: .BLKW   1               ;3RD STATUS WORD

 002240  000001          KMCR14: .BLKW   1               ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 14
 002242  000001          KMS114: .BLKW   1               ;VECTOR FOR KMC11 NUMBER 14
 002244  000001          KMS214: .BLKW   1               ;DDCMP LINE# FOR KMC11 NUMBER 14
 002246  000001          KMS314: .BLKW   1               ;3RD STATUS WORD

 002250  000001          KMCR15: .BLKW   1               ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 15
 002252  000001          KMS115: .BLKW   1               ;VECTOR FOR KMC11 NUMBER 15
 002254  000001          KMS215: .BLKW   1               ;DDCMP LINE# FOR KMC11 NUMBER 15
 002256  000001          KMS315: .BLKW   1               ;3RD STATUS WORD

 002260  000001          KMCR16: .BLKW   1               ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 16
 002262  000001          KMS116: .BLKW   1               ;VECTOR FOR KMC11 NUMBER 16
 002264  000001          KMS216: .BLKW   1               ;DDCMP LINE# FOR KMC11 NUMBER 16
 002266  000001          KMS316: .BLKW   1               ;3RD STATUS WORD

 002270  000001          KMCR17: .BLKW   1               ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 17
 002272  000001          KMS117: .BLKW   1               ;VECTOR FOR KMC11 NUMBER 17
 002274  000001          KMS217: .BLKW   1               ;DDCMP LINE# FOR KMC11 NUMBER 17
 002276  000001          KMS317: .BLKW   1               ;3RD STATUS WORD
```

```
   584  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
 002310  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

```

```
                         FORMAT OF STATUS TABLE
                         ----------------------

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


                         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])
```

```

                                                  ;PROGRAM INITIALIZATION
                                                  ;LOCK OUT INTERRUPTS
                                                  ;SET UP PROCESSOR STACK
                                                  ;SET UP POWER FAIL VECTOR
                                                  ;CLEAR PROGRAM CONTROL FLAGS AND COUNTS
                                                  ;TYPE TITLE MESSAGE

002402  012737  000340  177776  .START: MOV    #340,PS           ;LOCK OUT INTERRUPTS
002410  012706  001200                  MOV    #STACK,SP         ;SET UP STACK
002414  012737  007126  000024          MOV    #$PWRDN,@#24      ;SET UP POWER FAIL VECTOR
002422  013737  001472  001476          MOV    KMNUM,SAVNUM      ;SAVE NUMBER OF DEVICES IN SYSTEM.
002430  005037  011416                  CLR    SWFLG             ;CLEAR SOFT TYPEOUT FLAG
002434  105037  001203                  CLRB   $ERFLG            ;CLEAR ERROR FLAG
002440  105037  001511                  CLRB   QV.FLG            ;ZERO QUICK VERIFY FLAG
002444  012737  002070  001502          MOV    #KM.MAP-10,CREAM;GET MAP POINTER.
002452  012737  002276  001504          MOV    #CNT.MAP-4,MILK   ;GET PASS COUNT MAP POINTER
002460  012737  100000  001500          MOV    #BIT15,RUN        ;POINT POINTER TO FIRST DEVICE.
002466  012700  002302                  MOV    #CNT.MAP,R0       ;PASS COUNT POINTER TO R0
002472  005020                  23$:    CLR    (R0)+             ;CLEAR TABLE
002474  022700  002402                  CMP    #CNT.MAP+100,R0   ;DONE YET?
002500  001374                          BNE    23$               ;KEEP GOING
002502  005037  001216                  CLR    $ERRPC            ;CLEAR LAST ERROR POINTER
002506  012737  000001  001202          MOV    #1,$TSTNM         ;SET UP FOR TEST 1
002514  012737  002402  001206          MOV    #.START,$LPADR    ;SET UP FOR POWER FAIL BEFORE
                                                                 ;TESTING STARTS
002522  132737  000001  001336          BITB   #1,$ENV           ; IS IT RUNNING UNDER APT?
002530  001404                          BEQ    3$                ; IF NOT CHECK FOR TYPE OF SWITCH REGISTER.
002532  013737  001340  000176          MOV    $SWREG,SWREG      ; LOAD SOFTWARE SWITCH REG.
002540  000423                          BR     6$+2              ; GO SET UP SOFTWARE SWITCH REG.
002542  013746  000006          3$:     MOV    @#6,-(SP)         ;SAVE CURRENT VECTORS
002546  013746  000004                  MOV    @#4,-(SP)         ;
002552  012737  002606  000004          MOV    #6$,@#4           ;SET UP FOR TIMEOUT
002560  012737  177570  001240          MOV    #177570,SWR       ;SET SWR TO HARD SWR ADDRESS
002566  012737  177570  001242          MOV    #177570,DISPLAY   ;SET DISPLAY TO HARD SWR ADDRESS
002574  022777  177777  176436          CMP    #-1,@SWR          ;REFERENCE HARDWARE SWITCH REGISTER
002602  001402                          BEQ    6$+2              ;IF = -1 USE SOFT SWR ANYWAY
002604  000407                          BR     7$                ;IF IT EXISTS AND NOT = -1 USE HARD SWR
002606  022626                  6$:     CMP    (SP)+,(SP)+       ;ADJUST STACK
002610  012737  000176  001240          MOV    #SWREG,SWR        ;POINTER TO SOFT SWR
002616  012737  000174  001242          MOV    #DISPREG,DISPLAY;POINTER TO SOFT DISPLAY REG
002624  012637  000004          7$:     MOV    (SP)+,@#4         ;RESTORE VECTORS
002630  012637  000006                  MOV    (SP)+,@#6         ;
002634  105737  001506                  TSTB   INIFLG            ;HAS INITIALIZATION BEEN PERFORMED
002640  001006                          BNE    20$               ;BR IF YES
002642  022737  004070  000042          CMP    #$ENDAD,@#42      ;IF ACT-11 AUTOMATIC MODE, DON'T TYPE ID
002650  001402                          BEQ    20$               ;
002652  104401  001000                  TYPE   ,MTITLE           ;TYPE TITLE MESSAGE
002656  004737  011212          20$:    JSR    PC,CKSWR          ;        ;CHECK FOR SOFT SWR
002662  017737  176352  001446          MOV    @SWR,STRTSW       ;STORE STARTING SWITCHES
002670  005737  000042                  TST    @#42              ;IS IT RUNNING IN AUTO MODE?
002674  001402                          BEQ    .+6               ;BR IF NO
002676  005037  001446                  CLR    STRTSW            ;IF YES, CLEAR SWITCHES
002702  032737  000001  001446          BIT    #SW00,STRTSW      ;IF SW00=1, QUESTIONS ARE ASKED.
002710  001012                          BNE    17$               ;BR IF SW00=1
002712  105737  001446                  TSTB   STRTSW            ;BIT7=1??
```

```
002716  100007                          BPL     17$             ;BR IF SW07=0
002720  005737  001470                  TST     KMACTV          ;ARE ANY DEVICES SELECTED?
002724  001027                          BNE     16$             ;BR IF YES
002726  104401  010731                  TYPE,   NOACT           ;NO DEVICES SELECTED.
002732  000000                          HALT                    ;STOP THE SHOW
002734  000776                          BR      .-2             ;DISQUALIFY CONTINUE SWITCH
002736  105737  001336          17$:    TSTB    $ENV            ; IS IT UNDER APT DUMP MODE?
002742  001405                          BEQ     27$             ; YES, CHECK IF APT SIZED IT?
002744  132737  000001  001336          BITB    #1,$ENV         ; IS IT UNDER Q,V OR RUN MODE?
002752  001012                          BNE     30$             ; YES, NEEDS ONLY APT SIZING.
002754  000406                          BR      33$             ; NO, NEEDS REGULAR AUTO.SIZE.
002756  105737  001337          27$:    TSTB    $ENVM           ; IS IT SIZED BY APT?
002762  100406                          BMI     30$             ; YES, NEEDS ONLY APT SIZING.
002764  042737  000001  001446          BIC     #SW00,STRTSW    ; SIZE ONLY IN AUTO MODE.
002772  004737  012110          33$:    JSR     PC,AUTO.SIZE    ; GO DO THE AUTO.SIZE.
002776  000402                          BR      16$             ; GO PRINT THE MAP.
003000  004737  013510          30$:    JSR     PC,APT.SIZE     ; GO DO THE APT SIZING.
003004  105737  001506          16$:    TSTB    INIFLG          ;FIRST TIME?
003010  001410                          BEQ     21$             ;BR IF YES
003012  105737  001446                  TSTB    STRTSW          ;IF USING SAME PARAMETERS DONT TYPE MAP
003016  100431                          BMI     1$
003020  032737  000006  001446          BIT     #BIT1!BIT2,STRTSW;IS TEST NO. OR LOCK SELECTED
003026  001403                          BEQ     24$             ;IF NO THEN TYPE STATUS
003030  000424                          BR      1$              ;IF YES DO NOT TYPE STATUS
003032  105137  001506          21$:    COMB    INIFLG          ;SET FLAG
003036  104401  010077          24$:    TYPE    ,XHEAD          ;TYPE HEADER
003042  012704  002100                  MOV     #KM.MAP,R4      ;SET POINTER
003046  010437  001276          5$:     MOV     R4,$TMP0        ;SET ADDRESS
003052  012437  001300                  MOV     (R4)+,$TMP1     ;SET CSR
003056  001411                          BEQ     1$              ;ALL DONE IF ZERO
003060  012437  001302                  MOV     (R4)+,$TMP2     ;SET STAT1
003064  012437  001304                  MOV     (R4)+,$TMP3     ;SET STAT2
003070  012437  001306                  MOV     (R4)+,$TMP4     ;SET STAT3
003074  104416                          CONVRT                  ;TYPE OUT STATUS MAP
003076  011060                          XSTATQ                  ;
003100  000762                          BR      5$
003102  012700  002100          1$:     MOV     #KM.MAP,R0      ;R0 POINTS TO STATUS TABLE

                                ;;***********************************************************************
                                ;;*AUTO SIZE TEST
                                ;;*THIS TEST VERIFYS THAT THE KMC11S AND/OR KMC11S ARE AT THE CORRECT FLOATING
                                ;;*ADDRESSES FOR YOUR SYSTEM. IF THIS TEST FAILS, IT IS NOT A HARDWARE ERROR.
                                ;;*CHECK THE ADDRESSES OF ALL FLOATING DEVICES (DJ,DH,DQ,DU,DUP,LK,DMC,DZ,KMC).
                                ;;*IF THERE ARE NO OTHER FLOATING DEVICES BEFORE THE KMC11, THE FIRST
                                ;;* KMC11 IS 760110. NO DEVICE SHOULD EVER BE AT
                                ;;*ADDRESS 760000.
                                ;;***********************************************************************

003106  013746  000004                  MOV     @#4,-(SP)       ;SAVE LOC 4
003112  013746  000006                  MOV     @#6,-(SP)       ;SAVE LOC 6
003116  005037  000006                  CLR     @#6             ;CLEAR VEC+2
003122  005037  001302                  CLR     $TMP2           ;CLEAR FLAG
003126  011037  002066          AUSTRT: MOV     (R0),KMCSR      ;GET NEXT KMC CSR
003132  001510                          BEQ     AUDONE          ;BR IF DONE
003134  012737  003240  000004  2$:     MOV     #NODEV,@#4      ;SET UP FOR TIMEOUT
003142  012703  000010          3$:     MOV     #10,R3          ;R3 IS COUNT OF DEVICES BEFORE KMC
```

```
003146  012702  003342          4$:     MOV     #DEVTAB,R2      ;R2 IS DEVICE TABLE PONTER
003152  012701  160010                  MOV     #160010,R1      ;START WITH ADDRESS 160010
003156  005711                  FLOAT:  TST     (R1)            ;CHECK ADDRESS IN R1
003160  111204                          MOVB    (R2),R4         ;IF NO TIMEOUT, GET NEXT ADDRESS
003162  060401                          ADD     R4,R1           ;IN R1
003164  005201                          INC     R1              ;
003166  040401                          BIC     R4,R1           ;
003170  005703                          TST     R3              ;ANY MORE DEVICES TO CHECK FOR?
003172  001371                          BNE     FLOAT           ;BR IF YES
003174  012737  003244  000004          MOV     #ERR,@#4        ;OK ONLY KMC'S ARE LEFT, SET UP FOR TIMEOUT
003202  005711                  FY:     TST     (R1)            ;CHECK KMC ADDRESS
003204  020137  002066                  CMP     R1,KMCSR        ;DOES IT MATCH
003210  001403                          BEQ     OK              ;BR IF YES
003212  062701  000010                  ADD     #10,R1          ;GET NEXT KMC ADDRESS
003216  000771                          BR      FY              ;DO IT AGAIN
003220  062700  000010          OK:     ADD     #10,R0          ;SKIP TO NEXT KMC CSR
003224  062701  000010                  ADD     #10,R1          ; GET NEXT KMC ADDRESS
003230  011037  002066                  MOV     (R0),KMCSR      ; GET NEXT KMC CSR
003234  001447                          BEQ     AUDONE          ; BRANCH IF ALL DONE.
003236  000761                          BR      FY              ; DO IT AGAIN.
003240  122243                  NODEV:  CMPB    (R2)+,-(R3)     ;ON TIMEOUT, INC R2, DEC R3
003242  000002                          RTI                     ;$LPADR
003244  005737  001302          ERR:    TST     $TMP2           ;CHECK FLAG IF = 0 TYPE HEADER
003250  001014                          BNE     1$              ;SKIP HEADER
003252  104401                          TYPE                    ;TYPEOUT HEADER MESSAGE
003254  010762                          CONERR                  ;CONFIGURATION ERROR!!!!
003256  012737  003244  001460          MOV     #ERR,SAVPC      ;SAVE PC FOR TYPEOUT
003264  104417                          CNVRT                   ;TYPE OUT ERROR PC
003266  003322                          ERRPC
003270  104401                          TYPE                    ;TYPE REST OF HEADER
003272  011027                          CNERR
003274  012737  177777  001302          MOV     #-1,$TMP2       ;SET FLAG SO IT ONLY GETS TYPED ONCE
003302  010137  001264          1$:     MOV     R1,$REG1        ;SAVE R1 FOR TYPEOUT
003306  104416                          CONVRT
003310  003330                          CONTAB                  ;TYPE CSR VALUES
003312  104401                  3$:     TYPE
003314  011050                          KMCM
003316  022626                  4$:     CMP     (SP)+,(SP)+     ;ADJUST STACK
003320  000737                          BR      OK              ;BR TO GET OUT
003322  000001                  ERRPC:  1
003324     006     002                  .BYTE   6,2
003326  001460                          SAVPC
003330  000002                  CONTAB: 2
003332     006     004                  .BYTE   6,4
003334  001264                          $REG1
003336     006     002                  .BYTE   6,2
003340  002066                          KMCSR
003342     007                  DEVTAB: .BYTE   7               ;DJ
003343     017                          .BYTE   17              ;DH
003344     007                          .BYTE   7               ;DQ
003345     007                          .BYTE   7               ;DU
003346     007                          .BYTE   7               ;DUP
003347     007                          .BYTE   7               ;LK
003350     007                          .BYTE   7               ;DMC
003351     007                          .BYTE   7               ;DZ
003352     007                          .BYTE   7               ;KMC
```

G04

```
        003354                          EVEN
003354                          AUDONE:
003354  012637  000006          1$:     MOV     (SP)+,@#6               ;RESTORE LOC 6
003360  012637  000004                  MOV     (SP)+,@#4               ;RESTORE LOC 4
003364  032737  000010  001446          BIT     #SW03,STRTSW            ;SELECT SPECIFIC DEVICES??
003372  001422                          BEQ     3$                      ;BR IF NO.
003374  104401  010017                  TYPE    ,MNEW                   ;TYPE THE MESSAGE.
003400  005000                          CLR     R0                      ;ZERO DATA LIGHTS
003402  000000                          HALT                            ;WAIT FOR USER TO TELL WHAT DEVICES TO RUN
003404  027737  175630  001474          CMP     @SWR,SAVACT             ;IS THE NUMBER VALID?
003412  101404                          BLOS    2$                      ;BR IF NUMBER IS OK.
003414  104401  007672                  TYPE    ,MERR3                  ;TELL USER OF INVALID NUMBER.
003420  000000                          HALT                            ;STOP EVERY THING.
003422  000776                          BR      .-2                     ;RESTART THE PROGRAM AGAIN.
003424  017737  175610  001470  2$:     MOV     @SWR,KMACTV             ;GET NEW DEVICE PATTERN
003432  013700  001470                  MOV     KMACTV,R0               ;SHOW THE USER WHAT HE SELECTED.
003436  000000                          HALT                            ;CONTINUE DYNAMIC SWITCHES.
003440  012700  000300          3$:     MOV     #300,R0                 ;PREPARE TO CLEAR THE FLOATING
003444  012701  000302                  MOV     #302,R1                 ;VECTOR AREA. 300-776
003450  010120                  4$:     MOV     R1,(R0)+                ;START PUTTING "PC+2 - HALT"
003452  005021                          CLR     (R1)+                   ;IN VECTOR AREA.
003454  022021                          CMP     (R0)+,(R1)+             ;POP POINTERS
003456  022700  001000                  CMP     #1000,R0                ;ALL DONE??
003462  001372                          BNE     4$                      ;BR IF NO.

                                ;TEST START AND RESTART
                                ;-----------------------

003464  012706  001200          .BEGIN: MOV     #STACK,SP               ;SET UP STACK
003470  013746  000006                  MOV     @#6,-(SP)               ;SAVE LOC 6
003474  013746  000004                  MOV     @#4,-(SP)               ;SAVE LOC 4
003500  005000                          CLR     R0                      ;START AT 0
003502  012737  003546  000004          MOV     #2$,@#4                 ;SET UP FOR TIME OUT
003510  005037  000006                  CLR     @#6                     ;TO AUTOSIZE MEMORY
003514  005720                  6$:     TST     (R0)+                   ;CHECK ADDRESS IN R0
003516  022700  157776                  CMP     #157776,R0              ;IS IT AT LEAST 28K
003522  001374                          BNE     6$                      ;BR IF NO
003524  162700  007776                  SUB     #7776,R0                ;SAVE 2K FOR MONITORS
003530  010037  001466          7$:     MOV     R0,MEMLIM               ;STORE MEMORY LIMIT
003534  012637  000004                  MOV     (SP)+,@#4               ;RESTORE LOC 4
003540  012637  000006                  MOV     (SP)+,@#6               ;RESTORE LOC 6
003544  000413                          BR      10$                     ;CONTINUE
003546  022626                  2$:     CMP     (SP)+,(SP)+             ;ADJUST STACK
003550  162700  000004                  SUB     #4,R0                   ;GET LAST GOOD ADDRESS
003554  162700  007776                  SUB     #7776,R0                ;SAVE 2K FOR MONITORS
003560  022700  030000                  CMP     #30000,R0               ;IS IT 8K?
003564  001361                          BNE     7$                      ;BR IF NO
003566  012700  037400                  MOV     #37400,R0               ;IF 8K DON'T SAVE 2K
003572  000756                          BR      7$                      ;
003574  012737  000340  177776  10$:    MOV     #340,PS                 ;LOCK OUT INTERRUPTS
003602  032737  000004  001446          BIT     #BIT2,STRTSW            ;CHECK FOR LOCK ON TEST
003610  001406                          BEQ     1$                      ;BR IF NO LOCK DESIRED.
003612  104401  007716                  TYPE    ,MLOCK                  ;TYPE LOCK SELECTED.
003616  012737  000240  004146          MOV     #NOP,TTST               ;SET UP TO LOCK
003624  000403                          BR      3$                      ;CONTINUE ALONG.
003626  013737  004360  004146  1$:     MOV     BRW,TTST                ;PREPARE NORMAL SCOPE ROUTINE
```

```
   916  003634  012737  011460  001206  3$:     MOV     #CYCLE,$LPADR   ;START AT "CYCLE" FIND WHICH DEVICE TO TEST
   917  003642  032737  000002  001446  4$:     BIT     #SW01,$TRTSW    ;IS TEST NO. SELECTED?
   918  003650  001002                          BNE     5$              ;BR IF YES
   919  003652  104401  007642                  TYPE    ,MR             ;TYPE R
   920  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  007620                  TYPE    ,MEPASS                 ; TYPE END PASS.
003700  104401  007745                  TYPE    ,MCSRX                  ; TYPE "CSR"
003704  104417  004104                  CNVRT   ,XCSR                   ; SHOW IT.
003710  104401  007753                  TYPE    ,MVECX                  ; TYPE VECTOR.
003714  104417  004112                  CNVRT   ,XVEC                   ; SHOW IT.
003720  104401  007761                  TYPE    ,MPASSX                 ; TYPE " PASSES "
003724  104417  004120                  CNVRT   ,XPASS                  ; SHOW IT.
003730  104401  007772                  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
```

```
004102  011460                          $RTNAD: .WORD   CYCLE
004104  000001                          XCSR:   1
004106     006         002                      .BYTE   6,2
004110  002066                                  KMCSR
004112  000001                          XVEC:   1
004114     004         002                      .BYTE   4,2
004116  002056                                  KMRVEC
004120  000001                          XPASS:  1
004122     006         002                      .BYTE   6,2
004124  001324                                  $PASS
004126  000001                          XERR:   1
004130     006         002                      .BYTE   6,2
004132  001212                                  $ERTTL


                                                ;SCOPE LOOP AND INTERATION HANDLER
                                                ;---------------------------------

                                        .SBTTL  SCOPE HANDLER ROUTINE

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

004134                                  $SCOPE:
004134  005037  001216                          CLR     $ERRPC                   ; CLEAR LAST ERROR PC
004140  023716  013734                          CMP     TST1+2,(SP)              ; IS THIS TEST #1 ?
004144  001413                                  BEQ     $XTSTR                   ; IF SO DON'T LOOP.
004146  000406                          TTST:   BR      1$
004150  105777  175070                          TSTB    @$TKS                    ; KEYBOARD DONE ?
004154  100067                                  BPL     $OVER                    ; IF NO DONT WAIT.
004156  017766  175064  177776                  MOV     @$TKB,-2(SP)
004164  032777  040000  175046  1$:     BIT     #BIT14,@SWR      ;;LOOP ON PRESENT TEST?
004172  001060                                  BNE     $OVER            ;;YES IF SW14=1
                                        ;#####START OF CODE FOR THE XOR TESTER#####
004174  000416                          $XTSTR: BR      6$               ;;IF RUNNING ON THE "XOR" TESTER CHANGE
                                                                         ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
004176  013746  000004                          MOV     @#ERRVEC,-(SP)   ;;SAVE THE CONTENTS OF THE ERROR VECTOR
004202  012737  004222  000004                  MOV     #5$,@#ERRVEC     ;;SET FOR TIMEOUT
004210  005737  177060                          TST     @#177060         ;;TIME OUT ON XOR?
004214  012637  000004                          MOV     (SP)+,@#ERRVEC   ;;RESTORE THE ERROR VECTOR
004220  000436                                  BR      $SVLAD           ;;GO TO THE NEXT TEST
004222  022626                          5$:     CMP     (SP)+,(SP)+      ;;CLEAR THE STACK AFTER A TIME OUT
004224  012637  000004                          MOV     (SP)+,@#ERRVEC   ;;RESTORE THE ERROR VECTOR
004230  000441                                  BR      $OVER            ;;LOOP ON THE PRESENT TEST
004232                                  6$:;#####END OF CODE FOR THE XOR TESTER#####
004232  105737  001203                  2$:     TSTB    $ERFLG           ;;HAS AN ERROR OCCURRED?
004236  001404                                  BEQ     3$               ;;BR IF NO
004240  105037  001203                  4$:     CLRB    $ERFLG           ;;ZERO THE ERROR FLAG
004244  005037  001310                          CLR     $TIMES           ;;CLEAR THE NUMBER OF ITERATIONS TO MAKE
004250  032777  004000  174762  3$:     BIT     #BIT11,@SWR      ;;INHIBIT ITERATIONS?
```

```
004256  001011                             BNE     1$                  ;;BR IF YES
004260  005737  001324                     TST     $PASS               ;;IF FIRST PASS OF PROGRAM
004264  001406                             BEQ     1$                  ;;       INHIBIT ITERATIONS
004266  005237  001204                     INC     $ICNT               ;;INCREMENT ITERATION COUNT
004272  023737  001310  001204             CMP     $TIMES,$ICNT        ;;CHECK THE NUMBER OF ITERATIONS MADE
004300  002015                             BGE     $OVER               ;;BR IF MORE ITERATION REQUIRED
004302  012737  000001  001204  1$:        MOV     #1,$ICNT            ;;REINITIALIZE THE ITERATION COUNTER
004310  013737  004362  001310             MOV     $MXCNT,$TIMES       ;;SET NUMBER OF ITERATIONS TO DO
004316  105237  001202          $SVLAD:    INCB    $TSTNM              ;;COUNT TEST NUMBERS
004322  113737  001202  001322             MOVB    $TSTNM,$TESTN       ;;SET TEST NUMBER IN APT MAILBOX
004330  011637  001206                     MOV     (SP),$LPADR         ;;SAVE SCOPE LOOP ADDRESS
004334  013777  001202  174700  $OVER:     MOV     $TSTNM,@DISPLAY     ;;DISPLAY TEST NUMBER
004342  013716  001206                     MOV     $LPADR,(SP)         ;;FUDGE RETURN ADDRESS
004346  005037  001444                     CLR     LOCK                        ; RESET LOCK ON DATA.
004352  013701  002066                     MOV     KMCSR,R1                    ; R1 CONTAINS BASE KMC ADDRESS.
004356  000002                             RTI
004360  000406                  BRW:       .WORD   406
004362  000020                  $MXCNT:    20                          ;;MAX. NUMBER OF ITERATIONS

                                           ;CHECK FOR FREEZE ON CURRENT DATA
                                           ;--------------------------------

004364  004737  011212          .SCOP1:    JSR     PC,CKSWR                   ;CHECK FOR SOFT SWR
004370  032777  001000  174642             BIT     #SW09,@SWR          ;IS SW09=1(SET)?
004376  001405                             BEQ     1$                  ;BR IF NOT SET.
004400  005737  001444                     TST     LOCK
004404  001402                             BEQ     1$
004406  013716  001444                     MOV     LOCK,(SP)           ;GOTO THE ADDRESS IN LOCK.
004412  000002                  1$:        RTI                         ;GO BACK.

                                           ;TELETYPE OUTPUT ROUTINE
                                           ;-----------------------

                                .SBTTL  TYPE ROUTINE

                                ;;*****************************************************************
                                ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
                                ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
                                ;*NOTE1:         $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
                                ;*NOTE2:         $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
                                ;*NOTE3:         $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
                                ;*
                                ;*CALL:
                                ;*1) USING A TRAP INSTRUCTION
                                ;*          TYPE     ,MESADR           ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
                                ;*OR
                                ;*          TYPE
                                ;*          MESADR
                                ;*

004414  105737  001257          $TYPE:     TSTB    $TPFLG              ;;IS THERE A TERMINAL?
004420  100002                             BPL     1$                  ;;BR IF YES
004422  000000                             HALT                        ;;HALT HERE IF NO TERMINAL
004424  000430                             BR      3$                  ;;LEAVE
004426  010046                  1$:        MOV     R0,-(SP)            ;;SAVE R0
004430  017600  000002                     MOV     @2(SP),R0           ;;GET ADDRESS OF ASCIZ STRING
```

```
004434  122737  000001  001336          CMPB    #APTENV,$ENV      ;;RUNNING IN APT MODE
004442  001011                          BNE     62$               ;;NO,GO CHECK FOR APT CONSOLE
004444  132737  000100  001337          BITB    #APTSPOOL,$ENVM   ;;SPOOL MESSAGE TO APT
004452  001405                          BEQ     62$               ;;NO,GO CHECK FOR CONSOLE
004454  010037  004464                  MOV     R0,61$            ;;SETUP MESSAGE ADDRESS FOR APT
004460  004737  004704                  JSR     PC,$ATY3          ;;SPOOL MESSAGE TO APT
004464  000000                  61$:    .WORD   0                 ;;MESSAGE ADDRESS
004466  132737  000040  001337  62$:    BITB    #APTCSUP,$ENVM    ;;APT CONSOLE SUPPRESSED
004474  001003                          BNE     60$               ;;YES,SKIP TYPE OUT
004476  112046                  2$:     MOVB    (R0)+,-(SP)       ;;PUSH CHARACTER TO BE TYPED ONTO STACK
004500  001005                          BNE     4$                ;;BR IF IT ISN'T THE TERMINATOR
004502  005726                          TST     (SP)+             ;;IF TERMINATOR POP IT OFF THE STACK
004504  012600                  60$:    MOV     (SP)+,R0          ;;RESTORE R0
004506  062716  000002          3$:     ADD     #2,(SP)           ;;ADJUST RETURN PC
004512  000002                          RTI                       ;;RETURN
004514  122716  000011          4$:     CMPB    #HT,(SP)          ;;BRANCH IF <HT>
004520  001430                          BEQ     8$
004522  122716  000200                  CMPB    #CRLF,(SP)        ;;BRANCH IF NOT <CRLF>
004526  001006                          BNE     5$
004530  005726                          TST     (SP)+             ;;POP  <CR><LF> EQUIV
004532  104401                          TYPE                      ;;TYPE A CR AND LF
004534  001313                          $CRLF
004536  105037  004672                  CLRB    $CHARCNT          ;;CLEAR CHARACTER COUNT
004542  000755                          BR      2$                ;;GET NEXT CHARACTER
004544  004737  004626          5$:     JSR     PC,$TYPEC         ;;GO TYPE THIS CHARACTER
004550  123726  001256          6$:     CMPB    $FILLC,(SP)+      ;;IS IT TIME FOR FILLER CHARS.?
004554  001350                          BNE     2$                ;;IF NO GO GET NEXT CHAR.
004556  013746  001254                  MOV     $NULL,-(SP)       ;;GET # OF FILLER CHARS. NEEDED
                                                                  ;;AND THE NULL CHAR.
004562  105366  000001          7$:     DECB    1(SP)             ;;DOES A NULL NEED TO BE TYPED?
004566  002770                          BLT     6$                ;;BR IF NO--GO POP THE NULL OFF OF STACK
004570  004737  004626                  JSR     PC,$TYPEC         ;;GO TYPE A NULL
004574  105337  004672                  DECB    $CHARCNT          ;;DO NOT COUNT AS A COUNT
004600  000770                          BR      7$                ;;LOOP


                                ;HORIZONTAL TAB PROCESSOR

004602  112716  000040          8$:     MOVB    #' ,(SP)          ;;REPLACE TAB WITH SPACE
004606  004737  004626          9$:     JSR     PC,$TYPEC         ;;TYPE A SPACE
004612  132737  000007  004672          BITB    #7,$CHARCNT       ;;BRANCH IF NOT AT
004620  001372                          BNE     9$                ;;TAB STOP
004622  005726                          TST     (SP)+             ;;POP SPACE OFF STACK
004624  000724                          BR      2$                ;;GET NEXT CHARACTER
004626  105777  174416          $TYPEC: TSTB    @$TPS             ;;WAIT UNTIL PRINTER IS READY
004632  100375                          BPL     $TYPEC
004634  116677  000002  174410          MOVB    2(SP),@$TPB       ;;LOAD CHAR TO BE TYPED INTO DATA REG.
004642  122766  000015  000002          CMPB    #CR,2(SP)         ;;IS CHARACTER A CARRIAGE RETURN?
004650  001003                          BNE     1$                ;;BRANCH IF NO
004652  105037  004672                  CLRB    $CHARCNT          ;;YES--CLEAR CHARACTER COUNT
004656  000406                          BR      $TYPEX            ;;EXIT
004660  122766  000012  000002  1$:     CMPB    #LF,2(SP)         ;;IS CHARACTER A LINE FEED?
004666  001402                          BEQ     $TYPEX            ;;BRANCH IF YES
004670  105227                          INCB    (PC)+             ;;COUNT THE CHARACTER
004672  000000                  $CHARCNT:.WORD  0                 ;;CHARACTER COUNT STORAGE
004674  000207                  $TYPEX: RTS     PC
```

```
                                             .SBTTL  APT COMMUNICATIONS ROUTINE

                                             ;;**************************************************************
004676  112737  000001  005142   $ATY1:      MOVB    #1,$FFLG         ;;TO REPORT FATAL ERROR
004704  112737  000001  005140   $ATY3:      MOVB    #1,$MFLG         ;;TO TYPE A MESSAGE
004712  000403                               BR      $ATYC
004714  112737  000001  005142   $ATY4:      MOVB    #1,$FFLG         ;;TO ONLY REPORT FATAL ERROR
004722                           $ATYC:
004722  010046                               MOV     R0,-(SP)         ;;PUSH R0 ON STACK
004724  010146                               MOV     R1,-(SP)         ;;PUSH R1 ON STACK
004726  105737  005140                       TSTB    $MFLG            ;;SHOULD TYPE A MESSAGE?
004732  001450                               BEQ     5$               ;;IF NOT:  BR
004734  122737  000001  001336               CMPB    #APTENV,$ENV     ;;OPERATING UNDER APT?
004742  001031                               BNE     3$               ;;IF NOT:  BR
004744  132737  000100  001337               BITB    #APTSPOOL,$ENVM  ;;SHOULD SPOOL MESSAGES?
004752  001425                               BEQ     3$               ;;IF NOT:  BR
004754  017600  000004                       MOV     @4(SP),R0        ;;GET MESSAGE ADDR.
004760  062766  000002  000004               ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
004766  005737  001316           1$:         TST     $MSGTYPE         ;;SEE IF DONE W/ LAST XMISSION?
004772  001375                               BNE     1$               ;;IF NOT:  WAIT
004774  010037  001332                       MOV     R0,$MSGAD        ;;PUT ADDR IN MAILBOX
005000  105720                   2$:         TSTB    (R0)+            ;;FIND END OF MESSAGE
005002  001376                               BNE     2$
005004  163700  001332                       SUB     $MSGAD,R0        ;;SUB START OF MESSAGE
005010  006200                               ASR     R0               ;;GET MESSAGE LNGTH IN WORDS
005012  010037  001334                       MOV     R0,$MSGLGT       ;;PUT LENGTH IN MAILBOX
005016  012737  000004  001316               MOV     #4,$MSGTYPE      ;;TELL APT TO TAKE MSG.
005024  000413                               BR      5$
005026  017637  000004  005052   3$:         MOV     @4(SP),4$        ;;PUT MSG ADDR IN JSR LINKAGE
005034  062766  000002  000004               ADD     #2,4(SP)                ;;BUMP RETURN ADDRESS
005042  013746  177776                       MOV     177776,-(SP)     ;;PUSH 177776 ON STACK
005046  004737  004414                       JSR     PC,$TYPE         ;;CALL TYPE MACRO
005052  000000                   4$:         .WORD   0
005054                           5$:
005054  105737  005142           10$:        TSTB    $FFLG            ;;SHOULD REPORT FATAL ERROR?
005060  001416                               BEQ     12$              ;;IF NOT:  BR
005062  005737  001336                       TST     $ENV             ;;RUNNING UNDER APT?
005066  001413                               BEQ     12$              ;;IF NOT:  BR
005070  005737  001316           11$:        TST     $MSGTYPE         ;;FINISHED LAST MESSAGE?
005074  001375                               BNE     11$              ;;IF NOT:  WAIT
005076  017637  000004  001320               MOV     @4(SP),$FATAL    ;;GET ERROR #
005104  062766  000002  000004               ADD     #2,4(SP)                ;;BUMP RETURN ADDR.
005112  005237  001316                       INC     $MSGTYPE         ;;TELL APT TO TAKE ERROR
005116  105037  005142           12$:        CLRB    $FFLG            ;;CLEAR FATAL FLAG
005122  105037  005141                       CLRB    $LFLG            ;;CLEAR LOG FLAG
005126  105037  005140                       CLRB    $MFLG            ;;CLEAR MESSAGE FLAG
005132  012601                               MOV     (SP)+,R1         ;;POP STACK INTO R1
005134  012600                               MOV     (SP)+,R0         ;;POP STACK INTO R0
005136  000207                               RTS     PC               ;;RETURN
005140     000                   $MFLG:      .BYTE   0                ;;MESSG. FLAG
005141     000                   $LFLG:      .BYTE   0                ;;LOG FLAG
005142     000                   $FFLG:      .BYTE   0                ;;FATAL FLAG
        005144                               .EVEN
        000200                   APTSIZE=200
        000001                   APTENV=001
        000100                   APTSPOOL=100
```

```
              000040                     APTCSUP=040
                                                 ;-------------------------

                                         .SBTTL  TTY INPUT ROUTINE

                                         ;;********************************************************************
                                         .ENABL  LSB

                                         .DSABL  LSB

                                         ;;********************************************************************
                                         ;*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
                                         ;*CALL:
                                         ;*       RDCHR                        ;;INPUT A SINGLE CHARACTER FROM THE TTY
                                         ;*       RETURN HERE                  ;;CHARACTER IS ON THE STACK
                                         ;*                                    ;;WITH PARITY BIT STRIPPED OFF
                                         ;
       005144 011646                     $RDCHR: MOV     (SP),-(SP)           ;;PUSH DOWN THE PC
       005146 016666 000004 000002               MOV     4(SP),2(SP)          ;;SAVE THE PS
       005154 105777 174064              1$:     TSTB    @$TKS                ;;WAIT FOR
       005160 100375                             BPL     1$                   ;;A CHARACTER
       005162 117766 174060 000004               MOVB    @$TKB,4(SP)          ;;READ THE TTY
       005170 042766 177600 000004               BIC     #↑C<177>,4(SP)       ;;GET RID OF JUNK IF ANY
       005176 026627 000004 000023               CMP     4(SP),#23            ;;IS IT A CONTROL-S?
       005204 001013                             BNE     3$                   ;;BRANCH IF NO
       005206 105777 174032              2$:     TSTB    @$TKS                ;;WAIT FOR A CHARACTER
       005212 100375                             BPL     2$                   ;;LOOP UNTIL ITS THERE
       005214 117746 174026                      MOVB    @$TKB,-(SP)          ;;GET CHARACTER
       005220 042716 177600                      BIC     #↑C177,(SP)          ;;MAKE IT 7-BIT ASCII
       005224 022627 000021                      CMP     (SP)+,#21            ;;IS IT A CONTROL-Q?
       005230 001366                             BNE     2$                   ;;IF NOT DISCARD IT
       005232 000750                             BR      1$                   ;;YES, RESUME
       005234 026627 000004 000140       3$:     CMP     4(SP),#140           ;;IS IT UPPER CASE?
       005242 002407                             BLT     4$                   ;;BRANCH IF YES
       005244 026627 000004 000175               CMP     4(SP),#175           ;;IS IT A SPECIAL CHAR?
       005252 003003                             BGT     4$                   ;;BRANCH IF YES
       005254 042766 000040 000004               BIC     #40,4(SP)            ;;MAKE IT UPPER CASE
       005262 000002                     4$:     RTI                          ;;GO BACK TO USER
                                         ;;********************************************************************
                                         ;*THIS ROUTINE WILL INPUT A STRING FROM THE TTY
                                         ;*CALL:
                                         ;*       RDLIN                        ;;INPUT A STRING FROM THE TTY
                                         ;*       RETURN HERE                  ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
                                         ;*                                    ;;TERMINATOR WILL BE A BYTE OF ALL 0'S

       005264 010346                     $RDLIN: MOV     R3,-(SP)             ;;SAVE R3
       005266 005046                             CLR     -(SP)                ;;CLEAR THE RUBOUT KEY
       005270 012703 005520              1$:     MOV     #$TTYIN,R3           ;;GET ADDRESS
       005274 022703 005527              2$:     CMP     #$TTYIN+7,R3         ;;BUFFER FULL?
       005300 101456                             BLOS    4$                   ;;BR IF YES
       005302 104402                             RDCHR                        ;;GO READ ONE CHARACTER FROM THE TTY
       005304 112613                             MOVB    (SP)+,(R3)           ;;GET CHARACTER
       005306 122713 000177              10$:    CMPB    #177,(R3)            ;;IS IT A RUBOUT
       005312 001022                             BNE     5$                   ;;BR IF NO
```

```
005314  005716                          TST     (SP)                ;;IS THIS THE FIRST RUBOUT?
005316  001007                          BNE     6$                  ;;BR IF NO
005320  112737  000134  005516          MOVB    #'\,9$              ;;TYPE A BACK SLASH
005326  104401  005516                  TYPE    ,9$
005332  012716  177777                  MOV     #-1,(SP)            ;;SET THE RUBOUT KEY
005336  005303                  6$:     DEC     R3                  ;;BACKUP BY ONE
005340  020327  005520                  CMP     R3,#$TTYIN          ;;STACK EMPTY?
005344  103434                          BLO     4$                  ;;BR IF YES
005346  111337  005516                  MOVB    (R3),9$             ;;SETUP TO TYPEOUT THE DELETED CHAR.
005352  104401  005516                  TYPE    ,9$                 ;;GO TYPE
005356  000746                          BR      2$                  ;;GO READ ANOTHER CHAR.
005360  005716                  5$:     TST     (SP)                ;;RUBOUT KEY SET?
005362  001406                          BEQ     7$                  ;;BR IF NO
005364  112737  000134  005516          MOVB    #'\,9$              ;;TYPE A BACK SLASH
005372  104401  005516                  TYPE    ,9$
005376  005016                          CLR     (SP)                ;;CLEAR THE RUBOUT KEY
005400  122713  000025          7$:     CMPB    #25,(R3)            ;;IS CHARACTER A CTRL U?
005404  001003                          BNE     8$                  ;;BR IF NO
005406  104401  005527                  TYPE    ,$CNTLU             ;;TYPE A CONTROL "U"
005412  000726                          BR      1$                  ;;GO START OVER
005414  122713  000022          8$:     CMPB    #22,(R3)            ;;IS CHARACTER A "↑R"?
005420  001011                          BNE     3$                  ;;BRANCH IF NO
005422  105013                          CLRB    (R3)                ;;CLEAR THE CHARACTER
005424  104401  001313                  TYPE    ,$CRLF              ;;TYPE A "CR" & "LF"
005430  104401  005520                  TYPE    ,$TTYIN             ;;TYPE THE INPUT STRING
005434  000717                          BR      2$                  ;;GO PICKUP ANOTHER CHACTER
005436  104401  001312          4$:     TYPE    ,$QUES              ;;TYPE A '?'
005442  000712                          BR      1$                  ;;CLEAR THE BUFFER AND LOOP
005444  111337  005516          3$:     MOVB    (R3),9$             ;;ECHO THE CHARACTER
005450  104401  005516                  TYPE    ,9$
005454  122723  000015                  CMPB    #15,(R3)+           ;;CHECK FOR RETURN
005460  001305                          BNE     2$                  ;;LOOP IF NOT RETURN
005462  105063  177777                  CLRB    -1(R3)              ;;CLEAR RETURN (THE 15)
005466  104401  001314                  TYPE    ,$LF                ;;TYPE A LINE FEED
005472  005726                          TST     (SP)+               ;;CLEAN RUBOUT KEY FROM THE STACK
005474  012603                          MOV     (SP)+,R3            ;;RESTORE R3
005476  011646                          MOV     (SP),-(SP)          ;;ADJUST THE STACK AND PUT ADDRESS OF THE
005500  016666  000004  000002          MOV     4(SP),2(SP)         ;;      FIRST ASCII CHARACTER ON IT
005506  012766  005520  000004          MOV     #$TTYIN,4(SP)
005514  000002                          RTI                         ;;RETURN
005516     000                  9$:     .BYTE   0                   ;;STORAGE FOR ASCII CHAR. TO TYPE
005517     000                          .BYTE   0                   ;;TERMINATOR
005520  000007                  $TTYIN: .BLKB   7                   ;;RESERVE 7 BYTES FOR TTY INPUT
005527     136  006525  000012  $CNTLU: .ASCIZ  /↑U/<15><12>        ;;CONTROL "U"
005534  043536  005015     000  $CNTLG: .ASCIZ  /↑G/<15><12>        ;;CONTROL "G"
005541     015  051412  051127  $MSWR:  .ASCIZ  <15><12>/SWR = /
005546  036440  000040
005552  020040  042516  020127  $MNEW:  .ASCIZ  /  NEW = /
005560  020075     000
        005564                  .EVEN
                                .SBTTL  READ AN OCTAL NUMBER FROM THE TTY

                                ;*************************************************************
                                ;*THIS ROUTINE WILL READ AN OCTAL (ASCII) NUMBER FROM THE TTY AND
                                ;*CHANGE IT TO BINARY.
                                ;*THE INPUT CHARACTERS WILL BE CHECKED TO INSURED THEY ARE LEGAL
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                                     ;*OCTAL DIGITS. IF AN ILLEGAL CHARACTER IS READ A "?" WILL BE TYPED
                                     ;*FOLLOWED BY A CARRIAGE RETURN-LINE FEED. THE COMPLETE NUMBER MUST
                                     ;*THEN BE RETYPED. THE INPUT IS TERMINATED BY TYPING A CARRIAGE RETURN.
                                     ;*CALL:
                                     ;*       RDOCT                         ;;READ AN OCTAL NUMBER
                                     ;*       RETURN HERE                   ;;LOW ORDER BITS ARE ON TOP OF THE STACK
                                     ;*                                     ;;HIGH ORDER BITS ARE IN $HIOCT

005564  011646                       $RDOCT: MOV     (SP),-(SP)             ;;PROVIDE SPACE FOR THE
005566  016666  000004  000002               MOV     4(SP),2(SP)            ;;INPUT NUMBER
005574  010046                               MOV     R0,-(SP)               ;;PUSH R0 ON STACK
005576  010146                               MOV     R1,-(SP)               ;;PUSH R1 ON STACK
005600  010246                               MOV     R2,-(SP)               ;;PUSH R2 ON STACK
005602  104403                       1$:     RDLIN                          ;;READ AN ASCIZ LINE
005604  012600                               MOV     (SP)+,R0               ;;GET ADDRESS OF 1ST CHARACTER
005606  010037  005712                       MOV     R0,5$                  ;;AND SAVE IT
005612  005001                               CLR     R1                     ;;CLEAR DATA WORD
005614  005002                               CLR     R2
005616  112046                       2$:     MOVB    (R0)+,-(SP)            ;;PICKUP THIS CHARACTER
005620  001420                               BEQ     3$                     ;;IF ZERO GET OUT
005622  122716  000060                       CMPB    #'0,(SP)               ;;MAKE SURE THIS CHARACTER
005626  003026                               BGT     4$                     ;;IS AN OCTAL DIGIT
005630  122716  000067                       CMPB    #'7,(SP)
005634  002423                               BLT     4$
005636  006301                               ASL     R1                     ;;*2
005640  006102                               ROL     R2
005642  006301                               ASL     R1                     ;;*4
005644  006102                               ROL     R2
005646  006301                               ASL     R1                     ;;*8
005650  006102                               ROL     R2
005652  042716  177770                       BIC     #↑C7,(SP)              ;;STRIP THE ASCII JUNK
005656  062601                               ADD     (SP)+,R1               ;;ADD IN THIS DIGIT
005660  000756                               BR      2$                     ;;LOOP
005662  005726                       3$:     TST     (SP)+                  ;;CLEAN TERMINATOR FROM STACK
005664  010166  000012                       MOV     R1,12(SP)              ;;SAVE THE RESULT
005670  010237  005722                       MOV     R2,$HIOCT
005674  012602                               MOV     (SP)+,R2               ;;POP STACK INTO R2
005676  012601                               MOV     (SP)+,R1               ;;POP STACK INTO R1
005700  012600                               MOV     (SP)+,R0               ;;POP STACK INTO R0
005702  000002                               RTI                            ;;RETURN
005704  005726                       4$:     TST     (SP)+                  ;;CLEAN PARTIAL FROM STACK
005706  105010                               CLRB    (R0)                   ;;SET A TERMINATOR
005710  104401                               TYPE                           ;;TYPE UP THRU THE BAD CHAR.
005712  000000                       5$:     .WORD   0
005714  104401  001312                       TYPE    ,$QUES                 ;;"?" "CR" & "LF"
005720  000730                               BR      1$                     ;;TRY AGAIN
005722  000000                       $HIOCT: .WORD   0                      ;;HIGH ORDER BITS GO HERE
                                     ;
                                     ;     INPUT OCTAL NUMBER ROUTINE
                                     ;
                                     ;---------------------------------------

005724  010546                       $INPUT: MOV     R5,-(SP)                    ; SAVE REGISTER R5.
005726  016605  000002                       MOV     2(SP),R5                    ; GET FIRST PARAMETER ADDRESS.
005732  012537  005770                       MOV     (R5)+,WHAT                  ; GET MESSAGE ADDRESS.
005736  012537  006050                       MOV     (R5)+,LOLIM                 ; GET LOW LIMIT FOR THE  #
005742  012537  006052                       MOV     (R5)+,HILIM                 ; GET HIGH LIMIT FOR THE #.
```

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005746  012537  006054                   MOV     (R5)+,WHERE              ; GET ADDRESS OF INBUFFER
005752  112537  006056                   MOVB    (R5)+,LOBITS             ; GET LOWMASK BITS.
005756  112537  006057                   MOVB    (R5)+,ADRCNT             ; GET # OF #'S TO BE GENERATED.
005762  010566  000002                   MOV     R5,2(SP)                 ; SAVE THE RETURN ADDRESS.
005766  104401                  INLP1:   TYPE                             ; TYPE THE MESSAGE.
005770  000000                  WHAT:    .WORD   0
005772  104404                           RDOCT                            ; READ OCTAL # FROM KEYBOARD.
005774  021637  006052                   CMP     (SP),HILIM               ; IS IT IN HIGH LIMIT?
006000  003003                           BGT     2$                       ; BRANCH IF NO.
006002  021637  006050                   CMP     (SP),LOLIM               ; IS IT MORE THAN LOW LIMIT.
006006  002005                           BGE     3$                       ; BRANCH IF YES.
006010  104401  001312          2$:      TYPE    ,$QUES                   ; TYPE  " ? "
006014  104401  001313                   TYPE    ,$CRLF                   ; TYPE <CR>,<LF>
006020  000762                           BR      INLP1
006022  013705  006054          3$:      MOV     WHERE,R5                 ; GET BUFFER ADDRESS.
006026  011625                  4$:      MOV     (SP),(R5)+               ; SAVE THE # IN RIGHT PLACE.
006030  062716  000002                   ADD     #2,(SP)                  ; NEXT SEQUENTIAL NUMBER.
006034  105337  006057                   DECB    ADRCNT                   ; COUNT BY 1.
006040  001372                           BNE     4$                       ; BRANCH IF NOT DONE.
006042  005726                           TST     (SP)+                    ; POP THE STACK POINTER.
006044  012605                           MOV     (SP)+,R5                 ; POP THE REG.5
006046  000002                           RTI
006050  000000                  LOLIM:   .WORD   0
006052  000000                  HILIM:   .WORD   0
006054  000000                  WHERE:   .WORD   0
006056     000                  LOBITS:  .BYTE   0
006057     000                  ADRCNT:  .BYTE   0

                                         ;  ADVANCE TO NEXT TEST HANDLER
                                         ;---------------------------------

006060  013716  001442          .ADVANCE:        MOV     NEXT,(SP)                ; CRUNCH STACK WITH ADDRESSOF SCOPE CALL
006064  005037  001444                   CLR     LOCK                     ; RESET TIGHT LOOP ADDRESS
006070  000002                           RTI                              ; CHECK TO SEE IF OLD TEST GETS REPEATED

                                         ;SAVE PC OF TEST THAT FAILED AND R0-R5
                                         ;------------------------------------

006072  016637  000004  001460  .SAV05:  MOV     4(SP),SAVPC      ;SAVE R7 (PC)

                                         ;SAVE R0-R5

006100  010537  001274          SV05:    MOV     R5,$REG5         ;SAVE R5
006104  010437  001272                   MOV     R4,$REG4         ;SAVE R4
006110  010337  001270                   MOV     R3,$REG3         ;SAVE R3
006114  010237  001266                   MOV     R2,$REG2         ;SAVE R2
006120  010137  001264                   MOV     R1,$REG1         ;SAVE R1
006124  010037  001262                   MOV     R0,$REG0         ;SAVE R0
006130  000002                           RTI                      ;LEAVE.

                                         ;RESTORE R0-R5

006132  013700  001262          .RES05:  MOV     $REG0,R0         ;RESTORE R0
006136  013701  001264                   MOV     $REG1,R1         ;RESTORE R1
006142  013702  001266                   MOV     $REG2,R2         ;RESTORE R2
006146  013703  001270                   MOV     $REG3,R3         ;RESTORE R3
```

```
006152  013704  001272                            MOV     $REG4,R4            ;RESTORE R4
006156  013705  001274                            MOV     $REG5,R5            ;RESTORE R5
006162  000002                                    RTI                         ;LEAVE

                                          ;       ;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER
                                          ;       ;-------------------------------------------------------------
                                          ;
006164  104401  001313                    .CONVR: TYPE    ,$CRLF
006170  010046                            .CNVRT: MOV     R0,-(SP)
006172  010146                                    MOV     R1,-(SP)
006174  010346                                    MOV     R3,-(SP)
006176  010446                                    MOV     R4,-(SP)
006200  010546                                    MOV     R5,-(SP)
006202  017601  000012                            MOV     @12(SP),R1
006206  062766  000002  000012                    ADD     #2,12(SP)
006214  012137  006406                            MOV     (R1)+,WRDCNT
006220  112137  006410                    1$:     MOVB    (R1)+,CHRCNT
006224  112137  006411                            MOVB    (R1)+,SPACNT
006230  013137  006412                            MOV     @(R1)+,BINWRD
006234  122737  000003  006410                    CMPB    #3,CHRCNT
006242  001003                                    BNE     2$
006244  042737  177400  006412                    BIC     #177400,BINWRD
006252  013704  006412                    2$:     MOV     BINWRD,R4
006256  113705  006410                            MOVB    CHRCNT,R5
006262  012700  011106                            MOV     #TEMP,R0
006266  010403                            3$:     MOV     R4,R3
006270  042703  177770                            BIC     #177770,R3
006274  062703  000060                            ADD     #060,R3
006300  110320                                    MOVB    R3,(R0)+
006302  000241                                    CLC
006304  006004                                    ROR     R4
006306  000241                                    CLC
006310  006004                                    ROR     R4
006312  000241                                    CLC
006314  006004                                    ROR     R4
006316  005305                                    DEC     R5
006320  001362                                    BNE     3$
006322  012703  011150                            MOV     #MDATA,R3
006326  114023                            4$:     MOVB    -(R0),(R3)+
006330  105337  006410                            DECB    CHRCNT
006334  001374                                    BNE     4$
006336  105737  006411                            TSTB    SPACNT
006342  001405                                    BEQ     6$
006344  112723  000040                    5$:     MOVB    #040,(R3)+
006350  105337  006411                            DECB    SPACNT
006354  001373                                    BNE     5$
006356  105013                            6$:     CLRB    (R3)
006360  104401  011150                            TYPE    ,MDATA
006364  005337  006406                            DEC     WRDCNT
006370  001313                                    BNE     1$
006372  012605                                    MOV     (SP)+,R5
006374  012604                                    MOV     (SP)+,R4
006376  012603                                    MOV     (SP)+,R3
006400  012601                                    MOV     (SP)+,R1
006402  012600                                    MOV     (SP)+,R0
006404  000002                                    RTI
```

```
006406  000000                       WRDCNT: 0
006410  000000                       CHRCNT: 0
        006411                       SPACNT=CHRCNT+1
006412  000000                       BINWRD: 0


                                                 ;TRAP DISPATCH SERVICE
                                                 ;ARGUMENT OF TRAP IS EXTRACTED
                                                 ;AND USED AS OFFSET TO OBTAIN POINTER
                                                 ;TO SELECTED SUBROUTINE

                                     .SBTTL  TRAP DECODER

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

006414  010046                       $TRAP:  MOV     R0,-(SP)           ;;SAVE R0
006416  016600  000002                       MOV     2(SP),R0           ;;GET TRAP ADDRESS
006422  005740                               TST     -(R0)              ;;BACKUP BY 2
006424  111000                               MOVB    (R0),R0            ;;GET RIGHT BYTE OF TRAP
006426  006300                               ASL     R0                 ;;POSITION FOR INDEXING
006430  016000  006450                       MOV     $TRPAD(R0),R0      ;;INDEX TO TABLE
006434  000200                               RTS     R0                 ;;GO TO ROUTINE


                                     ;;THIS IS USE TO HANDLE THE "GETPRI" MACRO

006436  011646                       $TRAP2: MOV     (SP),-(SP)         ;;MOVE THE PC DOWN
006440  016666  000004  000002               MOV     4(SP),2(SP)        ;;MOVE THE PSW DOWN
006446  000002                               RTI                        ;;RESTORE THE PSW

                                     .SBTTL  TRAP TABLE

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

                                     ;       ROUTINE
                                     ;       -------
006450  006436                       $TRPAD: .WORD   $TRAP2
006452  004414                               $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE


006454  005144                               $RDCHR  ;;CALL=RDCHR    TRAP+2(104402)  TTY TYPEIN CHARACTER ROUTINE
006456  005264                               $RDLIN  ;;CALL=RDLIN    TRAP+3(104403)  TTY TYPEIN STRING ROUTINE
006460  005564                               $RDOCT  ;;CALL=RDOCT    TRAP+4(104404)  READ AN OCTAL NUMBER FROM TTY
006462  004364                               .SCOPI  ;;CALL=SCOPI    TRAP+5(104405)  CALL TO LOOP ON CURRENT DATA HANDLER
006464  006072                               .SAVOS  ;;CALL=SAVOS    TRAP+6(104406)  CALL TO REGISTER SAVE ROUTINE
006466  006132                               .RESOS  ;;CALL=RESOS    TRAP+7(104407)  CALL TO REGISTER RESTORE ROUTINE
006470  007362                               .MSTCLR ;;CALL=MSTCLR   TRAP+10(104410) CALL TO ISSUE A MASTER CLEAR
006472  007332                               .DELAY  ;;CALL=DELAY    TRAP+11(104411) CALL TO DELAY
006474  007400                               .ROMCLK ;;CALL=ROMCLK   TRAP+12(104412) CALL TO CLOCK ROM ONCE
006476  007446                               .DATACLK        ;;CALL=DATACLK  TRAP+13(104413) CALL TO CLOCK DATA
006500  007512                               .TIMER  ;;CALL=TIMER    TRAP+14(104414) CALL TO DELAY A CLOCK TICK
```

G05

```
006502  005724                                 $INPUT   ;;CALL=INPUT     TRAP+15(104415) CALL TO OCTAL # INPUT ROUTINE
006504  006164                                 .CONVRT  ;;CALL=CONVRT    TRAP+16(104416) CALL TO    .....
006506  006170                                 .CNVRT   ;;CALL=CNVRT     TRAP+17(104417) CALL TO    .......
006510  006060                                 .ADVANCE        ;;CALL=ADVANCE   TRAP+20(104420) CALL TO ADVANCE TO NEXT TEST
                                       ;
                                       ;------------------------------------------------------------
                                       ;:***********************************************************
                                                ;ERROR HANDLER
                                                ;-------------

006512  004737  011212           $ERROR: JSR     PC,CKSWR         ;CHECK FOR SOFT SWR
006516  032777  010000  172514           BIT     #SW12,@SWR       ;BELL ON ERROR?
006524  001406                           BEQ     XBX              ;BR IF NO BELL
006526  105777  172516                   TSTB    @$TPS            ;TTY READY.
006532  100003                           BPL     XBX              ;DON'T WAIT IF TTY NOT READY.
006534  112777  000207  172510           MOVB    #207,@$TPB       ;PUSH A BELL AT THE TTY.
006542  032777  020000  172470   XBX:    BIT     #SW13,@SWR       ;DELETE ERROR PRINT OUT?
006550  001107                           BNE     HALTS            ;BR IF NO PRINT OUT WANTED.
006552  021637  001216                   CMP     (SP),$ERRPC      ;WAS THIS ERROR FOUND LAST TIME?
006556  001404                           BEQ     1$               ;BR IF YES
006560  011637  001216                   MOV     (SP),$ERRPC      ;RECORD BEING HERE
006564  105037  001203                   CLRB    $ERFLG           ;PREPARE HEADER
006570  104406                   1$:     SAVOS                    ;SAVE ALL PROC REGISTERS
006572  011605                           MOV     (SP),R5          ;GET THE PC OF ERROR
006574  162705  000002                   SUB     #2,R5            ;GET ADDRESS OF TRAP CALL
006600  011504                           MOV     (R5),R4          ;GET ERROR INSTRUCTION
006602  110437  001214                   MOVB    R4,$ITEMB        ; COPY ERROR # FOR APT HANDLING
006606  006304                           ASL     R4               ;MULT BY TWO
006610  061504                           ADD     (R5),R4          ;DOUBLE IT
006612  006304                           ASL     R4               ;MULT AGAIN
006614  042704  177001                   BIC     #177001,R4       ;CLEAR JUNK
006620  062704  001512                   ADD     #$ERRTB,R4       ;GET POINTER
006624  012437  006740                   MOV     (R4)+,ERRMSG     ;GET ERROR MESSAGE
006630  012437  006752                   MOV     (R4)+,DATAHD     ;GET DATA HEADRER
006634  011437  006764                   MOV     (R4),DATABP      ;GET DATA TABLE
006640  105737  001203                   TSTB    $ERFLG           ;TYPE HEADREER
006644  001403                           BEQ     TYPMSG           ;BR IF YES
006646  005737  006764                   TST     DATABP           ;DOES DATA TABLE EXIST?
006652  001040                           BNE     TYPDAT           ;BR IF YES.
006654  104401  001313           TYPMSG: TYPE    ,$CRLF
006660  104401  001313                   TYPE    ,$CRLF
006664  005737  001444                   TST     LOCK
006670  001402                           BEQ     1$
006672  104401  010015                   TYPE    ,MASTEK
006676  104401  010003           1$:     TYPE    ,MTSTN
006702  104417  007120                   CNVRT   ,XTSTN           ;SHOW IT
006706  104401  010072                   TYPE    ,MERRPC          ;TYPE PC.
006712  104417  007112                   CNVRT   ,ERTABO          ;SHOW IT
006716  104401  001313                   TYPE    ,$CRLF           ;GIVE A CR/LF
006722  112737  177777  001203           MOVB    #-1,$ERFLG       ;NO MORE HEADER UNLESS NO DATA TABLE.
006730  005737  006740                   TST     ERRMSG           ;IS THERE AN ERROR MESSAGE?
006734  001402                           BEQ     WRKO.FM          ;BR IF NO.
006736  104401                           TYPE                     ;TYPE
006740  000000                   ERRMSG: 0                        ;    ERROR MESSAGE
006742                           WRKO.FM:                         ;
006742  005737  006752                   TST     DATAHD           ;DATA HEADER?
```

```
006746  001402                              BEQ     TYPDAT          ;BR IF NO
006750  104401                              TYPE                    ;TYPE
006752  000000                      DATAHD: 0                       ;     DATA HEADER
006754  005737  006764              TYPDAT: TST     DATABP          ;DATA TABLE?
006760  001402                              BEQ     RESREG          ;BR IF NO.
006762  104416                              CONVRT                  ;SHOW
006764  000000                      DATABP: 0                       ;     DATA TABLE
006766  104407                      RESREG: RESOS                   ;RESTORE PROC REGISTERS
006770  122737  000001  001336      HALTS:  CMPB    #APTENV,$ENV    ; IS APT RUNNING ?
006776  001007                              BNE     3$              ; SKIP APT CALL IF NOT.
007000  113737  001214  007012              MOVB    $ITEMB,6$       ; COPY ERROR #.
007006  004737  004714                      JSR     PC,$ATY4        ; CALL APT SERVICES.
007012  000000                      6$:     .WORD   0               ; ERROR # GOES HERE.
007014  000777                      9$:     BR      9$              ; LOCK HERE.
007016  022737  004070  000042      3$:     CMP     #$ENDAD,@#42    ;IF ACT-11 AUTOMATIC MODE, HALT!!
007024  001403                              BEQ     1$
007026  005777  172206                      TST     @SWR            ;HALT ON ERROR?
007032  100005                              BPL     EXITER          ;BR IF NO HALT ON ERROR
007034  010046                      1$:     PUSHRO                  ;SAVE RO
007036  016600  000002                      MOV     2(SP),RO        ;SHOW ERROR PC IN DATA LIGHTS
007042  000000                              HALT                    ;HALT
007044  012600                              POPRO                   ;GET RO
007046  005237  001212              EXITER: INC     $ERTTL          ;UPDATE ERROR COUNT
007052  032777  000400  172160              BIT     #SW08,@SWR      ;GOTO TOP OF TEST?
007060  001007                              BNE     1$              ;BR IF YES
007062  032777  002000  172150              BIT     #SW10,@SWR      ;GOTO NEXT TEST?
007070  001407                              BEQ     2$              ;BR IF NO
007072  013737  001442  001206              MOV     NEXT,$LPADR     ;SET FOR NEXT TEST
007100  012706  001200              1$:     MOV     #STACK,SP       ;RESET SP
007104  000177  172076                      JMP     @$LPADR         ;GOTO SPECIFIED TEST
007110  000002                      2$:     RTI                     ;$LPADR
007112  000001                      ERTAB0: 1
007114     006     002                      .BYTE   6,2
007116  001460                              SAVPC
007120  000001                      XTSTN:  1
007122     003     002                      .BYTE   3,2
007124  001202                              $TSTNM
                                            ;ENTER HERE ON POWER FAILURE
                                            ;---------------------------

                                    .SBTTL  POWER DOWN AND UP ROUTINES

                                    ;;*****************************************************************
                                    ;POWER DOWN ROUTINE
007126  012737  007316  000024      $PWRDN: MOV     #$ILLUP,@#PWRVEC  ;;SET FOR FAST UP
007134  012737  000340  000026              MOV     #340,@#PWRVEC+2   ;;PRIO:7
007142  010046                              MOV     R0,-(SP)          ;;PUSH R0 ON STACK
007144  010146                              MOV     R1,-(SP)          ;;PUSH R1 ON STACK
007146  010246                              MOV     R2,-(SP)          ;;PUSH R2 ON STACK
007150  010346                              MOV     R3,-(SP)          ;;PUSH R3 ON STACK
007152  010446                              MOV     R4,-(SP)          ;;PUSH R4 ON STACK
007154  010546                              MOV     R5,-(SP)          ;;PUSH R5 ON STACK
007156  017746  172056                      MOV     @SWR,-(SP)        ;;PUSH @SWR ON STACK
007162  010637  007322                      MOV     SP,$SAVR6         ;;SAVE SP
007166  012737  007200  000024              MOV     #$PWRUP,@#PWRVEC  ;;SET UP VECTOR
007174  000000                              HALT
```

```
007176  000776                          BR      .-2                     ;;HANG UP

                                ;;*************************************************************
                                ;POWER UP ROUTINE
007200  012737  007316  000024  $PWRUP: MOV     #$ILLUP,@#PWRVEC        ;;SET FOR FAST DOWN
007206  013706  007322                  MOV     $SAVR6,SP               ;;GET SP
007212  005037  007322                  CLR     $SAVR6                  ;;WAIT LOOP FOR THE TTY
007216  005237  007322          1$:     INC     $SAVR6                  ;;WAIT FOR THE INC
007222  001375                          BNE     1$                      ;;OF  WORD
007224  104401  007562                  TYPE    ,MPFAIL                 ;
007230  104417  007324                  CNVRT   ,PFTAB                  ;
007234  105037  001203                  CLRB    $ERFLG                  ;CLEAR ERROR FLAG.
007240  005037  001216                  CLR     $ERRPC                  ; CLEAR LAST ERROR PC
007244  013701  002066                  MOV     KMCSR,R1                ; RESTORE DEVICE ADDRESS.
007250  005011                          CLR     (R1)                    ; CLEAR THE CSR.
007252  104410                          MSTCLR                          ;
007254  012677  171760                  MOV     (SP)+,@SWR              ;;POP STACK INTO @SWR
007260  012605                          MOV     (SP)+,R5                ;;POP STACK INTO R5
007262  012604                          MOV     (SP)+,R4                ;;POP STACK INTO R4
007264  012603                          MOV     (SP)+,R3                ;;POP STACK INTO R3
007266  012602                          MOV     (SP)+,R2                ;;POP STACK INTO R2
007270  012601                          MOV     (SP)+,R1                ;;POP STACK INTO R1
007272  012600                          MOV     (SP)+,R0                ;;POP STACK INTO R0
007274  012737  007126  000024          MOV     #$PWRDN,@#PWRVEC        ;;SET UP THE POWER DOWN VECTOR
007302  012737  000340  000026          MOV     #340,@#PWRVEC+2         ;;PRIO:7
007310  104401                          TYPE                            ;;REPORT THE POWER FAILURE
007312  007562                  $PWRMG: .WORD   MPFAIL                  ;;POWER FAIL MESSAGE POINTER
007314  000002                          RTI
007316  000000                  $ILLUP: HALT                            ;;THE POWER UP SEQUENCE WAS STARTED
007320  000776                          BR      .-2                     ;; BEFORE THE POWER DOWN WAS COMPLETE
007322  000000                  $SAVR6: 0                               ;;PUT THE SP HERE

007324  000001                  PFTAB:  1
007326     003     002          .BYTE   3,2
007330  001202                          $TSTNM

007332                          .DELAY:
007332  012777  000020  172534          MOV     #20,@KMP04
007340  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
007342  121111                          121111                          ;POKE CLOCK DELAY BIT
007344                          1$:
007344  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
007346  121224                          121224                          ;PORT4+IBUS*11
007350  032777  000020  172516          BIT     #BIT4,@KMP04            ;IS CLOCK BIT SET?
007356  001772                          BEQ     1$                      ;BR IF NO
007360  000002                          RTI

007362                          .MSTCLR:
007362  152777  000100  172500          BISB    #BIT6,@KMCSRH           ;SET MASTER CLEAR
007370  142777  000300  172472          BICB    #BIT6!BIT7,@KMCSRH      ;CLEAR MASTER CLEAR AND RUN
007376  000002                          RTI                             ;RETURN

007400                          .ROMCLK:
007400  152777  000002  172462          BISB    #BIT1,@KMCSRH           ;SET ROMI
007406  013677  172464                  MOV     @(SP)+,@KMP06           ;LOAD INSTRUCTION IN SEL6
007412  062746  000002                  ADD     #2,-(SP)                ;ADJUST STACK
```

```
007416  032777  000100  171614           BIT     #SW06,@SWR        ;HALT IF SW06 =1
007424  001401                           BEQ     1$                ;BR IF SW06 =0
007426  000000                           HALT                      ;HALT BEFORE CLOCKING INSTRUCTION
007430  152777  000003  172432  1$:      BISB    #BIT1!BIT0,@KMCSRH  ;CLOCK INSTRUCTION
007436  142777  000007  172424           BICB    #BIT2!BIT1!BIT0,@KMCSRH   ;CLEAR ROMO, ROMI, STEP
007444  000002                           RTI

007446                          .DATACLK:
007446  013637  011106                   MOV     @(SP)+,TEMP       ;PUT TICK COUNT IN TEMP
007452  062746  000002                   ADD     #2,-(SP)          ;ADJUST STACK
007456  152777  000020  172404  1$:      BISB    #BIT4,@KMCSRH     ;SET STEP LU
007464  027777  172376  172374           CMP     @KMCSR,@KMCSR     ;WASTE TIME
007472  142777  000020  172370           BICB    #BIT4,@KMCSRH     ;CLEAR STEP LU
007500  005337  011106                   DEC     TEMP              ;DEC TICK COUNT
007504  001364                           BNE     1$                ;BR IF NOT DONE
007506  000002                           RTI                       ;RETURN
007510  000001                  3$:      .BLKW 1

007512                          .TIMER:
007512  013637  011106                   MOV     @(SP)+,TEMP       ;MOVE COUNT TO TEMP
007516  062746  000002                   ADD     #2,-(SP)          ;ADJUST STACK
007522                          1$:
007522  104412                           ROMCLK                    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
007524  021364                           021364                    ;PORT4+IBUS* REG11
007526  032777  000002  172340           BIT     #2,@KMP04         ;IS PGM CLOCK BIT CLEAR?
007534  001772                           BEQ     1$                ;BR IF YES
007536                          2$:
007536  104412                           ROMCLK                    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
007540  021364                           021364                    ;PORT4+IBUS* REG11
007542  032777  000002  172324           BIT     #2,@KMP04         ;IS PGM CLOCK BIT SET?
007550  001372                           BNE     2$                ;BR IF YES
007552  005337  011106                   DEC     TEMP              ;DEC COUNT
007556  001361                           BNE     1$                ;BR IF NOT DONE
007560  000002                           RTI                       ;RETURN

007562  050200  051127  043040  MPFAIL: .ASCIZ  <200>/PWR FAILED. RESTART AT TEST /
007620  042600  042116  050040  MEPASS: .ASCIZ  <200>/END PASS DZKCC  /
007642  051200     000          MR:     .ASCIZ  <200>/R/
007645     200  047516  042040  MERR2:  .ASCIZ  <200>/NO DEVICES PRESENT./
007672  044600  051516  043125  MERR3:  .ASCIZ  <200>/INSUFFICIENT DATA!/
007716  046200  041517  020113  MLOCK:  .ASCIZ  <200>/LOCK ON SELECTED TEST/
007745     103  051123  020072  MCSRX:  .ASCIZ   /CSR: /
007753     126  041505  020072  MVECX:  .ASCIZ  /VEC: /
007761     120  051501  042523  MPASSX: .ASCIZ  /PASSES: /
007772  051105  047522  051522  MERRX:  .ASCIZ  /ERRORS: /
010003     124  051505  020124  MTSTN:  .ASCIZ  /TEST NO: /
010015     052     000          MASTEK: .ASCIZ  /*/
010017     200  042523  020124  MNEW:   .ASCIZ  <200>/SET SWITCH REG TO KMC11'S DESIRED ACTIVE./
010072  041520  020072     000  MERRPC: .ASCIZ  /PC: /
010077     200  020040  020040  XHEAD:  .ASCII  <200>/             MAP OF KMC11 STATUS/
010136  020200  020040  020040          .ASCII  <200>/             -------------------/
010175     200  020040  041520          .ASCII  <200>/  PC        CSR       STAT1      STAT2      STAT3/
010247     200  026455  026455          .ASCIZ  <200>/------    ------    ------     ------     ------/
010323     200  047510  020127  NUM:    .ASCIZ  <200>/HOW MANY KMC11'S TO BE TESTED?/
010363     200  051503  020122  CSR:    .ASCIZ  <200>/CSR ADDRESS?/
010401     200  042526  052103  VEC:    .ASCIZ  <200>/VECTOR ADDRESS?/
```

```
010422  041200  020122  051120  PRIO:    .ASCIZ  <200>/BR PRIORITY LEVEL? (4,5,6,7)?/
010461     200  044127  041511  MODU:    .ASCIZ  <200>/WHICH LINE UNIT? IF NONE TYPE "N", IF M8201 TYPE "1", IF M8202 TYP
010573     200  053523  052111  LINE:    .ASCIZ  <200>/SWITCH PAC#1 (DDCMP LINE #)?/
010631     200  053523  052111  BM:      .ASCIZ  <200>/SWITCH PAC#2 (BM873 BOOT ADD)?/
010671     200  051511  052040  CONN:    .ASCIZ  <200>/IS THE LOOP BACK CONNECTOR ON?/
010731     200  047516  042040  NOACT:   .ASCIZ  <200>/NO DEVICES ARE SELECTED/
010762  100200  046513  030503  CONERR:  .ASCIZ  <200><200>/KMC11 AT NONSTANDARD ADDRESS  PC: /
011027     200  054105  042520  CNERR:   .ASCIZ  <200>/EXPECTED  FOUND/
011050  024040  046513  024503  KMCM:    .ASCIZ  / (KMC) /
                                         .EVEN
011060  000005                           XSTATQ: 5
011062     006     003                           .BYTE   6,3
011064  001276                                   $TMP0
011066     006     003                           .BYTE   6,3
011070  001300                                   $TMP1
011072     006     003                           .BYTE   6,3
011074  001302                                   $TMP2
011076     006     003                           .BYTE   6,3
011100  001304                                   $TMP3
011102     006     002                           .BYTE   6,2
011104  001306                                   $TMP4
                                         .EVEN

                                                 ;BUFFERS FOR INPUT-OUTPUT

011106  000000                           TEMP:   0
        011150                           .=.+40
011150  000000                           MDATA:  0
        011212                           .=.+40


                                                 ;ROUTINE USED TO CHANGE SOFTWARE SWITCH
                                                 ;REGISTER USING THE CONSOLE TERMINAL
                                                 ;-----------------------------------------

011212  022737  000176  001240  CKSWR:   CMP     #SWREG,SWR       ;IS THE SOFT SWR BEING USED?
011220  001075                           BNE     CKSWR5           ;BR IF NO
011222  132737  000001  001336           BITB    #1,$ENV          ; IS IT RUNNING UNDER APT?
011230  001071                           BNE     CKSWR5           ; EXIT IF YES.
011232  022777  000007  170006           CMP     #7,@$TKB         ;WAS CTRL G TYPED? (7 BIT ASCII)
011240  001404                           BEQ     1$               ;BR IF YES
011242  022777  000207  167776           CMP     #207,@$TKB       ;WAS CTRL G TYPED? (8 BIT ASCII)
011250  001061                           BNE     CKSWR5           ;BR IF NO
011252  010246                  1$:      MOV     R2,-(SP)         ;STORE R2
011254  010346                           MOV     R3,-(SP)         ;STORE R3
011256  010446                           MOV     R4,-(SP)         ;STORE R4
011260  012737  177777  011416           MOV     #-1,SWFLG        ;SET SOFT TYPE OUT FLAG
011266  005002                  CKSWR1:  CLR     R2               ;CLEAR NEW SWR CONTENTS
011270  012704  177777                   MOV     #-1,R4           ;SET FLAG TO ALL ONES
011274  104401  005541                   TYPE    ,$MSWR           ;TYPE "SWR= "
011300  104417                  CKSWR2:  CNVRT                    ;TYPE OUT PRESENT CONTENTS
011302  011452                           SOFTSW                   ;OF SOFT SWITCH REGISTER
011304  104401  005552          CKSWR3:  TYPE    ,$MNEW           ;TYPE "NEW? "
011310  004737  011420          CKSWR4:  JSR     PC,INCHAR        ;GET RESPONSE
011314  022703  000015                   CMP     #15,R3           ;WAS IT A CR?
011320  001424                           BEQ     5$               ;BR IF YES
```

```
011322  022703  000012                   CMP     #12,R3          ;WAS IT A LF?
011326  001416                           BEQ     4$              ;BR IF YES
011330  022703  000025                   CMP     #25,R3          ;WAS IT CTRL U?
011334  001754                           BEQ     CKSWR1          ;BR IF YES(START OVER)
011336  022703  000007                   CMP     #7,R3           ;IF CNTL G GET NEXT CHAR
011342  001762                           BEQ     CKSWR4
011344  005004                           CLR     R4              ;IT MUST BE A DIGIT SO CLR FLAG
011346  042703  177770                   BIC     #177770,R3      ;ONLY 0-7 ARE LEGAL SO MASK OFF BITS
011352  006302                           ASL     R2              ;SHIFT R2 3 TIMES
011354  006302                           ASL     R2
011356  006302                           ASL     R2
011360  050302                           BIS     R3,R2           ;ADD LAST DIGIT
011362  000752                           BR      CKSWR4          ;GET NEXT CHARACTER
011364  012766  002402  000006  4$:      MOV     #.START,6(SP)   ;LF WAS TYPED SO GO TO START
011372  005704                  5$:      TST     R4              ;IS FLAG CLEAR?
011374  001002                           BNE     6$              ;IF NOT DON'T CHANGE SOFT SWR
011376  010277  167636                   MOV     R2,@SWR         ;IF YES THEN WRITE NEW CONTENTS TO SOFT SWR
011402  005037  011416          6$:      CLR     SWFLG           ;CLEAR TYPEOUT FLAG
011406  012604                           MOV     (SP)+,R4        ;RESTORE R4
011410  012603                           MOV     (SP)+,R3        ;RESTORE R3
011412  012602                           MOV     (SP)+,R2        ;RESTORE R2
011414  000207                  CKSWR5:  RTS     PC              ;RETURN

011416  000000                  SWFLG:   0

011420  105777  167620          INCHAR:  TSTB    @$TKS
011424  100375                           BPL     .-4
011426  017703  167614                   MOV     @$TKB,R3
011432  105777  167612                   TSTB    @$TPS
011436  100375                           BPL     .-4
011440  010377  167606                   MOV     R3,@$TPB
011444  042703  000200                   BIC     #BIT7,R3
011450  000207                           RTS     PC

011452  000001                  SOFTSW:  1
011454     006     002                   .BYTE   6,2
011456  000176                           SWREG
```

```
                                                ;
                                                ;ROUTINE USED TO "CYCLE" THROUGH UP TO 16 KMC11'S
                                                ;THIS ROUTINE SETS UP THE CONTROL ADDRESS FOR THE DIAGNOSTIC
                                                ;AND RUNS THE SPECIFIED KMC11'S.   THIS ROUTINE *MUST*
                                                ;BE RUN FIRST BEFORE ENTERING THE DIAGNOSTIC FOR THE
                                                ;SETUP NECESSARY.
                                                ;

011460  005737  001470          CYCLE:  TST     KMACTV          ;ARE ANY KMC11'S TO BE TESTED?
011464  001004                          BNE     1$              ;BR IF OK.
011466  104401  010731                  TYPE    ,NOACT          ;NO KMC11'S SELECTED!!
011472  000000                          HALT                    ;STOP THE SHOW.
011474  000776                          BR      .-2             ;DISQUALIFY CONT. SW.
011476  000241                  1$:     CLC                     ;CLEAR PROC. CARRY BIT.
011500  006137  001500                  ROL     RUN             ;UPDATE POINTER
011504  005537  001500                  ADC     RUN             ;CATCH CARRY FROM RUN
011510  062737  000004  001504          ADD     #4,MILK         ;UPDATE POINTER
011516  062737  000010  001502          ADD     #10,CREAM       ;UPDATE ADDRESS POINTER.
011524  022737  002300  001502          CMP     #KM.MAP+200,CREAM
011532  001006                          BNE     2$              ;KEEP GOING; NOT ALL TESTED FOR.
011534  012737  002100  001502          MOV     #KM.MAP,CREAM   ;RESET ADDRESS POINTER.
011542  012737  002302  001504          MOV     #CNT.MAP,MILK   ;RESET PASS COUNT POINTER
011550  033737  001500  001470  2$:     BIT     RUN,KMACTV      ;IS THIS ONE ACTIVE?
011556  001747                          BEQ     1$              ;BR IF NO
011560  013700  001502                  MOV     CREAM,R0        ;GET ADDRESS POINTER
011564  013702  001504                  MOV     MILK,R2         ;GET PASS COUNT POINTER
011570  012037  002066                  MOV     (R0)+,KMCSR     ;LOAD SYSTEM CTRL. REG
011574  011037  002056                  MOV     (R0),KMRVEC     ;LOAD VECTOR
011600  042737  177000  002056          BIC     #177000,KMRVEC  ;CLEAR UNWANTED BITS
011606  012037  002050                  MOV     (R0)+,STAT1     ;LOAD STAT1
011612  012037  002052                  MOV     (R0)+,STAT2     ;LOAD STAT2
011616  012037  002054                  MOV     (R0)+,STAT3     ;LOAD STAT3
011622  012237  001324                  MOV     (R2)+,$PASS     ;LOAD PASS COUNT
011626  012237  001212                  MOV     (R2)+,$ERTTL    ;LOAD ERROR COUNT
011632  012700  000002                  MOV     #2,R0           ;SAVE CORE THIS WAY!
011636  013737  002066  002070          MOV     KMCSR,KMCSRH
011644  005237  002070                  INC     KMCSRH
011650  013737  002070  002072          MOV     KMCSRH,KMCTL
011656  005237  002072                  INC     KMCTL
011662  013737  002072  002074          MOV     KMCTL,KMP04
011670  060037  002074                  ADD     R0,KMP04
011674  013737  002074  002076          MOV     KMP04,KMP06
011702  060037  002076                  ADD     R0,KMP06

011706  013737  002056  002060          MOV     KMRVEC,KMRLVL   ;PTY LVL
011714  060037  002060                  ADD     R0,KMRLVL       ;
011720  013737  002060  002062          MOV     KMRLVL,KMTVEC   ;TX VEC
011726  060037  002062                  ADD     R0,KMTVEC       ;
011732  013737  002062  002064          MOV     KMTVEC,KMTLVL   ;TX LVL
011740  060037  002064                  ADD     R0,KMTLVL

011744  032737  000002  001446          BIT     #SW01,STRTSW    ;IS TEST NO. SELECTED
011752  001447                          BEQ     7$              ;BR IF NO
011754                          4$:
011754  005737  000042                  TST     @#42            ;RUNNING IN AUTO MODE?
```

```
011760  001044                          BNE     7$                ;BR IF YES
011762  104401  001313                  TYPE    ,$CRLF
011766  104415                          INPUT
011770  010003                          MTSTN
011772  000001                          1
011774  001000                          1000
011776  001202                          $TSTNM
012000     000                  .BYTE   0
012001     001                  .BYTE   1
012002  012700  013732                  MOV     #TST1,R0
012006  022710                  5$:     CMP     (PC)+,(R0)        ;CMP FIRST WORD TO 12737
012010  012737                          MOV     (PC)+,@(PC)+
012012  001020                          BNE     6$                ;BR IF NOT SAME
012014  023760  001202  000002          CMP     $TSTNM,2(R0)      ;DOES $TSTNM MATCH?
012022  001014                          BNE     6$                ;BR IF NO
012024  022760  001202  000004          CMP     #$TSTNM,4(R0)     ;IS LAST WORD OK?
012032  001010                          BNE     6$                ;BR IF NO
012034  010037  001206                  MOV     R0,$LPADR         ;IT IS A LEGAL TEST SO DO IT
012040  104401  007642                  TYPE    ,MR
012044  042737  000002  001446          BIC     #SW01,STRTSW
012052  000412                          BR      8$
012054  005720                  6$:     TST     (R0)+             ;POP R0
012056  020027  034670                  CMP     R0,#TLAST+10      ;AT END YET?
012062  001351                          BNE     5$                ;BR IF NO
012064  104401  001312                  TYPE    ,$QUES            ;YES ILLEGAL TEST NO.
012070  000731                          BR      4$                ;TRY AGAIN

012072  012737  013732  001206  7$:     MOV     #TST1,$LPADR      ;PREPARE $LPADR ADDRESS
012100  013701  002066          8$:     MOV     KMCSR,R1          ;R1 = BASE KMC11 ADDRESS
012104  000177  167076                  JMP     @$LPADR           ;GO START TESTING.


                                        ;ROUTINE USED TO "AUTO SIZE" THE KMC11
                                        ;CSR AND VECTOR.
                                        ;NOTE:  THE CSR MAY BE ANY WHERE IN THE FLOATING
                                        ;       ADDRESS RANGE (160000:164000)
                                        ;       AND THE VECTOR MAY BE ANY WHERE IN THE
                                        ;       FLOATING VECTOR RANGE (300:770)
                                        ;
                                        ;
012110                          AUTO.SIZE:
012110  000005                          RESET                     ;INSURE A BUS INIT.
012112  012702  002100          CSRMAP: MOV     #KM.MAP,R2        ;LOAD MAP POINTER.
012116  005022                  1$:     CLR     (R2)+             ;ZERO ENTIRE MAP
012120  022702  002300                  CMP     #KM.END,R2        ;ALL DONE?
012124  001374                          BNE     1$                ;BR IF NO
012126  005037  001472                  CLR     KMNUM             ;SET OCTAL NUMBER OF KMC11'S TO 0
012132  012702  002100                  MOV     #KM.MAP,R2        ;R2 POINTS TO KMC MAP
012136  005037  001470                  CLR     KMACTV            ;CLEAR ACTIVE
012142  032737  000001  001446          BIT     #SW00,STRTSW      ;QUESTIONS?
012150  001002                          BNE     .+6               ;BR IF YES
012152  000137  012532                  JMP     7$                ;IF NO SKIP QUESTIONS
012156  012737  000001  001306          MOV     #1,$TMP4          ;START WITH 1
012164  104415                          INPUT
012166  010323                          NUM
012170  000001                          1
```

```
012172  000020                              16.
012174  001302                              $TMP2
012176     000                              .BYTE   0
012177     001                              .BYTE   1
012200  013737  001302  001472              MOV     $TMP2,KMNUM       ;KMNUM = HOW MANY
012206  104401  001313          12$:        TYPE    ,$CRLF
012212  104416                              CONVRT                    ;TYPE WHICH KMC IS BEING DONE
012214  013164                              WHICH                     ;$TMP4 IS WHICH KMC
012216  005237  001306                      INC     $TMP4
012222  104415                              INPUT
012224  010363                              CSR
012226  160000                              160000
012230  164000                              164000
012232  001304                              $TMP3
012234     000                              .BYTE   0
012235     001                              .BYTE   1
012236  013722  001304                      MOV     $TMP3,(R2)+       ;STORE CSR IN MAP
012242  104415                              INPUT
012244  010401                              VEC
012246  000000                              0
012250  000776                              776
012252  001304                              $TMP3
012254     000                              .BYTE   0
012255     001                              .BYTE   1
012256  013712  001304                      MOV     $TMP3,(R2)        ;STORE VECTOR IN MAP
012262  104401                  10$:        TYPE
012264  010422                              PRIO                      ;ASK WHAT BR LEVEL
012266  004737  013456                      JSR     PC,INTTY          ;GET RESPONSE
012272  022703  000024                      CMP     #24,R3            ;
012276  101014                              BHI     50$               ;BR IF LESS THAN 4
012300  022703  000027                      CMP     #27,R3            ;
012304  103411                              BLO     50$               ;BR IF GREATER THAN 7
012306  012704  000011                      MOV     #11,R4            ;R4 = NUMBER OF SHIFTS
012312  006303                              ASL     R3                ;SHIFT R3 LEFT
012314  005304                              DEC     R4                ;DEC SHIFT COUNT
012316  001375                              BNE     .-4               ;BR IF NOT DONE
012320  042703  170777                      BIC     #170777,R3        ;BIC UNWANTED BITS
012324  050312                              BIS     R3,(R2)           ;PUT BR LEVEL IN STATUS MAP
012326  000403                              BR      8$                ;CONTINUE
012330  104401                  50$:        TYPE
012332  001312                              $QUES                     ;RESPONSE IS OUT OF LIMITS
012334  000752                              BR      10$               ;TRY AGAIN
012336                          8$:
012336                          9$:
012336  104401                  16$:        TYPE
012340  010461                              MODU                      ;ASK WHICH LINE UNIT
012342  004737  013456                      JSR     PC,INTTY          ;GET REPLY
012346  022703  000021                      CMP     #21,R3            ;"1"
012352  001417                              BEQ     30$
012354  022703  000022                      CMP     #22,R3            ;"2"
012360  001412                              BEQ     31$
012362  022703  000116                      CMP     #116,R3           ;"N"
012366  001403                              BEQ     32$
012370  104401                              TYPE
012372  001312                              $QUES                     ;IF NOT A 1,2 OR N TYPE "?"
012374  000760                              BR      16$               ;TRY AGIAN
```

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012376  052722  010000          32$:    BIS     #BIT12,(R2)+        ;SET BIT 12 IN STAT2 IF NO LU
012402  022222                          CMP     (R2)+,(R2)+         ;POP OVER STAT2 AND STAT3
012404  000445                          BR      33$
012406  052712  020000          31$:    BIS     #BIT13,(R2)         ;SET BIT 13 IN STAT2 IF M8202
012412  104401                  30$:    TYPE
012414  010671                          CONN                        ;ASK IF LOOP-BACK IS ON
012416  004737  013456                  JSR     PC,INTTY            ;GET REPLY
012422  022703  000131                  CMP     #131,R3             ;Y
012426  001406                          BEQ     17$
012430  022703  000116                  CMP     #116,R3             ;N
012434  001406                          BEQ     18$
012436  104401                          TYPE
012440  001312                          $QUES                       ;IF NOT Y OR N TYPE "?"
012442  000763                          BR      30$                 ;TRY AGAIN
012444  052722  040000          17$:    BIS     #BIT14,(R2)+        ;TURNAROUND IS CONNECTED
012450  000402                          BR      19$
012452  042722  040000          18$:    BIC     #BIT14,(R2)+        ;NO TURNAROUND
012456                          19$:
012456  104415                          INPUT
012460  010573                          LINE
012462  000000                          0
012464  000377                          377
012466  001304                          $TMP3
012470     000                          .BYTE   0
012471     001                          .BYTE   1
012472  113722  001304                  MOVB    $TMP3,(R2)+         ;STORE SWITCH PAC IN MAP
012476  104415                          INPUT
012500  010631                          BM
012502  000000                          0
012504  000377                          377
012506  001304                          $TMP3
012510     000                          .BYTE   0
012511     001                          .BYTE   1
012512  113722  001304                  MOVB    $TMP3,(R2)+         ;STORE SWITCH PAC IN MAP
012516  005722                          TST     (R2)+               ;POP OVER STAT3
012520  005337  001302          33$:    DEC     $TMP2               ;DEC KMC COUNT
012524  001230                          BNE     12$                 ;BR IF MORE TO DO
012526  000137  013064                  JMP     13$                 ;CONTINUE
012532  012701  160000          7$:     MOV     #160000,R1          ;SET FOR FIRST ADDRESS TO BE TESTED
012536  012737  013156  000004          MOV     #6$,@#4             ;SET FOR NON-EXISTANT DEVICE TIME OUT
012544  005011                  2$:     CLR     (R1)                ;CLEAR SEL0
012546  005711                          TST     (R1)                ;IF KMC11 KMCSR S/B 0
012550  001135                          BNE     3$                  ;IF NO DEV ; TRAP TO 4. IF NO BIT 8 THEN NO KMC11
012552  005061  000006                  CLR     6(R1)               ;CLEAR SEL6
012556  005761  000006                  TST     6(R1)               ;IF KMC11 THEN KMRIC S/B =0!
012562  001130                          BNE     3$                  ;BR IF NOT KMC11
012564  012711  002000                  MOV     #BIT10,(R1)         ;SET ROMO
012570  005061  000004                  CLR     4(R1)               ;CLEAR SEL4
012574  012761  125252  000006          MOV     #125252,6(R1)       ;WRITE THIS TO SEL6
012602  052711  020000                  BIS     #BIT13,(R1)         ;WRITE IT!
012606  022761  125252  000004          CMP     #125252,4(R1)       ;WAS IT WRITTEN?
012614  001113                          BNE     3$                  ;IF NO IT IS NOT CRAM
                                ;AT THIS POINT IT IS ASSUMED THAT R1 HOLDS A KMC11 CSR ADDRESS.
012616                          21$:
012616  010122                  22$:    MOV     R1,(R2)+            ;STORE CSR IN CORE TABLE.
012620  012711  001000          15$:    MOV     #BIT9,(R1)          ;CLEAR LINE UNIT LOOP
```

```
012624  005061  000004                   CLR     4(R1)             ;CLEAR PORT4
012630  012761  122113  000006           MOV     #122113,6(R1)     ;LOAD INSTRUCTION (CLR DTR)
012636  052711  000400                   BIS     #BIT8,(R1)        ;CLOCK INSTRUCTION
012642  012761  021264  000006           MOV     #021264,6(R1)     ;LOAD INSTRUCTION
012650  052711  000400                   BIS     #BIT8,(R1)        ;CLOCK INSTRUCTION
012654  122761  000377  000004           CMPB    #377,4(R1)        ;IS IT ALL ONES?
012662  001003                           BNE     .+10              ;BR IF NO
012664  052712  010000                   BIS     #BIT12,(R2)       ;IF YES, NO LINE UNIT, SET STATUS BIT
012670  000436                           BR      20$
012672  032761  000002  000004           BIT     #BIT1,4(R1)       ;IS SWITCH A ONE?
012700  001403                           BEQ     .+10              ;BR IF M8201
012702  052712  060000                   BIS     #BIT13!BIT14,(R2)  ;M8202 ASSUME CONNECTOR
012706  000427                           BR      20$               ;CONNECTOR ON)
012710  032761  000010  000004           BIT     #BIT3,4(R1)       ;IS MRDY SET
012716  001023                           BNE     20$               ;BR IF M8201 NO CONNECTOR (ON LINE)
012720  012761  000100  000004           MOV     #BIT6,4(R1)       ;LOAD PORT4
012726  012761  122113  000006           MOV     #122113,6(R1)     ;LOAD INSTRUCTION
012734  052711  000400                   BIS     #BIT8,(R1)        ;CLOCK INSTRUCTION(SET DTR)
012740  012761  021264  000006           MOV     #021264,6(R1)     ;LOAD INSTRUCTION
012746  052711  000400                   BIS     #BIT8,(R1)        ;CLOCK INSTRUCTION(READ MODEM REG)
012752  032761  000010  000004           BIT     #BIT3,4(R1)       ;IS MRDY SET NOW?
012760  001402                           BEQ     20$               ;BR IF NO CONNECTOR
012762  052712  040000                   BIS     #BIT14,(R2)       ;SET STATUS BIT FOR CONNECTOR
012766  005722                   20$:    TST     (R2)+             ;POP POINTER
012770  012761  021324  000006           MOV     #021324,6(R1)     ;PUT INSTRUCTION IN PORT6
012776  012711  001400                   MOV     #BIT9!BIT8,(R1)   ;PORT4+LU 15
013002  156122  000004                   BISB    4(R1),(R2)+       ;STORE DDCMP LINE # IN TABLE
013006  012761  021344  000006           MOV     #021344,6(R1)     ;PORT6+INSTRUCTION
013014  012711  001400                   MOV     #BIT8!BIT9,(R1)   ;CLOCK INSTR.
013020  156122  000004                   BISB    4(R1),(R2)+       ;STORE BM873 ADD IN TABLE
013024  005722                           TST     (R2)+             ;POP OVER STAT3
013026  005011                           CLR     (R1)              ;CLEAR ROMI
013030  005237  001472                   INC     KMNUM             ;UPDATE DEVICE COUNTER
013034  022737  000020  001472           CMP     #20,KMNUM         ;ARE MAX. NO. OF DEV FOUND?
013042  001410                           BEQ     13$               ;YES DON'T LOOK FOR ANY MORE.
013044  005011                   3$:     CLR     (R1)              ;CLEAR BIT 10
013046  005061  000006                   CLR     6(R1)             ;CLEAR SEL 6
013052  062701  000010           14$:    ADD     #10,R1            ;UPDATE CSR POINTER ADDRESS
013056  022701  164000                   CMP     #164000,R1
013062  001230                           BNE     2$                ;BR IF MORE ADDRESS TO CHECK.
013064  005037  001470           13$:    CLR     KMACTV
013070  005737  001472                   TST     KMNUM             ;WERE ANY KMC11'S FOUND AT ALL?
013074  001423                           BEQ     5$                ;ERROR AUTO SIZER FOUND NO KMC11'S IN THIS SYS.
013076  013701  001472                   MOV     KMNUM,R1
013102  010137  001476                   MOV     R1,SAVNUM         ;SAVE NUMBER OF DEVICES
013106  000241                   4$:     CLC
013110  006137  001470                   ROL     KMACTV            ;GENERATE ACTIVE REGISTER OF DEVICES.
013114  005237  001470                   INC     KMACTV            ;SET THE BIT
013120  005301                           DEC     R1
013122  001371                           BNE     4$                ;BR IF MORE TO GENERATE
013124  012737  000006  000004           MOV     #6,@#4            ;RESTORE TRAP VECTOR
013132  013737  001470  001474           MOV     KMACTV,SAVACT     ;SAVE ACTIVE REGISTER
013140  000137  013172                   JMP     VECMAP            ;GO FIND THE VECTOR NOW.
013144  104401  007645           5$:     TYPE    ,MERR2            ;NOTIFY OPR THAT NO KMC11'S FOUND.
013150  005000                           CLR     R0                ;MAKE DATA LIGHTS ZERO
013152  000000                           HALT                      ;STOP THE SHOW
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013154  000776                           BR      .-2                 ;DISABLE CONT. SW.
013156  012716  013052           6$:     MOV     #14$,(SP)           ;ENTERED BY NON-EXISTANT TIME-OUT.
013162  000002                           RTI                         ;RETURN TO MAINSTREAM

013164  000001                   WHICH:  1
013166     002     002                   .BYTE   2,2
013170  001306                           $TMP4

013172  032737  000001  001446   VECMAP: BIT     #SW00,STRTSW
013200  001114                           BNE     5$
013202  012737  000340  000022           MOV     #340,@#22           ;SET IOT TRAP PRIO TO 7
013210  012737  013364  000020           MOV     #4$,@#20            ;SET IOT TRAP VECTOR
013216  012702  002100                   MOV     #KM.MAP,R2          ;SET SOFTWARE POINTER
013222  012700  000300                   MOV     #300,R0             ;FLOATING VECTORS START HERE.
013226  012701  000302                   MOV     #302,R1             ;PC OF IOT INSTR.
013232  010120                   1$:     MOV     R1,(R0)+            ;START FILLING VECTOR AREA
013234  012721  000004                   MOV     #4,(R1)+            ;WITH .+2; IOT
013240  022021                           CMP     (R0)+,(R1)+         ;ADD 2 TO R0 +R1
013242  020127  001000                   CMP     R1,#1000
013246  101771                           BLOS    1$                  ;BR IF MORE TO FILL
013250  013737  001470  001276           MOV     KMACTV,$TMP0        ;STORE TEMPORALLY
013256  006037  001276           2$:     ROR     $TMP0               ;BRING OUT A BIT
013262  103063                           BCC     5$                  ;BR IF ALL DONE
013264  012704  000012                   MOV     #12,R4              ;R4 IS INDEX REGISTER
013270  016437  013442  177776           MOV     BRLVL(R4),PS        ;SET PS TO 7
013276  011201                           MOV     (R2),R1
013300  012761  000200  000004           MOV     #200,4(R1)
013306  012711  001000                   MOV     #BIT9,(R1)          ;SET ROMI
013312  012761  121111  000006           MOV     #121111,6(R1)       ;PUT INSTRUCTION IN PORT6
013320  012711  001400                   MOV     #BIT9!BIT8,(R1)     ;FORCE AN INTERRUPT
013324  105200                   7$:     INCB    R0                  ;STALL
013326  001376                           BNE     .-2                 ;FOR TIME TO INTERUPT
013330  162704  000002                   SUB     #2,R4               ;GET NEXT LOWEST PS LEVEL
013334  001404                           BEQ     6$                  ;BR IF R4 = 0
013336  016437  013442  177776           MOV     BRLVL(R4),PS        ;MOVE NEXT LOWER LEVEL IN PS
013344  000767                           BR      7$                  ;BR TO DELAY
013346  052762  005300  000002   6$:     BIS     #5300,2(R2)         ;NO INTERUPT ASSUME 300 AT LEVEL 5 AND FIX KMC11 LATER
013354  005011                   3$:     CLR     (R1)                ;CLEAR ROMI
013356  062702  000010                   ADD     #10,R2              ;POP SOFTWARE POINTER
013362  000735                           BR      2$                  ;KEEP GOING
013364  051662  000002           4$:     BIS     (SP),2(R2)          ;GET VECTOR ADDRESS
013370  042762  000007  000002           BIC     #7,2(R2)            ;CLEAR JUNK
013376  016405  013444                   MOV     BRLVL+2(R4),R5      ;GET BR LEVEL OF KMC11
013402  006305                           ASL     R5                  ;SHIFT LEVEL 4 PLACES
013404  006305                           ASL     R5                  ;TO THE LEFT FOR THE
013406  006305                           ASL     R5                  ;STATUS TABLE
013410  006305                           ASL     R5
013412  042705  170777                   BIC     #170777,R5          ;CLEAR UNWANTED BITS
013416  050562  000002                   BIS     R5,2(R2)            ;PUT BR LEVEL IN STATUS TABLE
013422  022626                           CMP     (SP)+,(SP)+         ;POP IOT JUNK OFF STACK
013424  012716  013354                   MOV     #3$,(SP)            ;SET FOR RETURN
013430  000002                           RTI
013432  012737  004134  000020   5$:     MOV     #$SCOPE,@#20        ; RESTORE SCOPE VECTOR
013440  000207                           RTS     PC                  ;ALL DONE WITH "AUTO SIZING"

013442  000000                   BRLVL:  PR0     ;LEVEL 0
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 013444  000000                               PR0       ;LEVEL 0
 013446  000200                               PR4       ;LEVEL 4
 013450  000240                               PR5       ;LEVEL 5
 013452  000300                               PR6       ;LEVEL 6
 013454  000340                               PR7       ;LEVEL 7


 013456  105777  165562           INTTY:     TSTB      @$TKS                ;WAIT FOR DONE
 013462  100375                              BPL       .-4
 013464  017703  165556                      MOV       @$TKB,R3             ;PUT CHAR IN R3
 013470  105777  165554                      TSTB      @$TPS                ;WAIT UNTIL PRINTER IS READY
 013474  100375                              BPL       .-4
 013476  010377  165550                      MOV       R3,@$TPB             ;ECHO CHAR
 013502  042703  000240                      BIC       #BIT7!BIT5,R3        ;MASK OFF LOWER CASE
 013506  000207                              RTS       PC                   ;RETURN

 013510                           APT.SIZE:
 013510  000005                              RESET
 013512  010046                              MOV       R0,-(SP)             ;;PUSH R0 ON STACK
 013514  010146                              MOV       R1,-(SP)             ;;PUSH R1 ON STACK
 013516  010246                              MOV       R2,-(SP)             ;;PUSH R2 ON STACK
 013520  010346                              MOV       R3,-(SP)             ;;PUSH R3 ON STACK
 013522  005037  013724                      CLR       VECTR                ; CLEAR THE LOCAL VARIABLE
 013526  005037  013730                      CLR       PRIRTY               ; CLEAN UP LOCAL VARIABLE
 013532  013700  001376                      MOV       $CDW1,R0             ; GET THE DEVICE COUNT
 013536  010037  001476                      MOV       R0,SAVNUM            ; SAVE THE NO. OF DEVICES
 013542  012701  001346                      MOV       #$MAMS1,R1           ; GET EXTRA INFO. BITS POINTER
 013546  013737  001372  013726              MOV       $BASE,BASE           ; GET BASE CSR ADDRESS
 013554  113737  001366  013724              MOVB      $VECT1,VECTR         ; GET THE VECTOR
 013562  113737  001367  013730              MOVB      $VECT1+1,PRIRTY      ; GET THE PRIORITY
 013570  013737  001374  001470              MOV       $DEVM,KMACTV         ; SAVE THE KMC'S SELECTED ACTIVE
 013576  013737  001470  001474              MOV       KMACTV,SAVACT        ; SAVE THE ACTIVE REGISTER
 013604  012702  001402                      MOV       #$DDW0,R2            ; GET ADDRESS OF FIRST DEVICE DESCRIPTOR WORD
 013610  012703  002100                      MOV       #KM.MAP,R3           ; GET POINTER TO DEVICE MAP
 013614  005023                   3$:        CLR       (R3)+                ; CLEAR DEVICE MAP
 013616  022703  002300                      CMP       #KM.END,R3           ; IS WHOLE DEV.MAP CLEARED?
 013622  003374                              BGT       3$                   ; NO, THEN GO ON.
 013624  012703  002100                      MOV       #KM.MAP,R3           ; RESTORE DEV.MAP POINTER.
 013630  013723  013726           1$:        MOV       BASE,(R3)+           ; LOAD CSR ADDRESS
 013634  112163  000001                      MOVB      (R1)+,1(R3)          ; GET EXTRA INFO. BITS
 013640  006213                              ASR       (R3)                 ; SET IT IN RIGHT POSITION.
 013642  006213                              ASR       (R3)                 ; SET IT IN RIGHT POSITION.
 013644  053713  013730                      BIS       PRIRTY,(R3)          ; GET PRIORITY IN STAT1
 013650  006313                              ASL       (R3)                 ; SET THEM IN RIGHT POSITION
 013652  006313                              ASL       (R3)                 ;   "    "   "    "     "
 013654  006313                              ASL       (R3)                 ;   "    "   "    "     "
 013656  006313                              ASL       (R3)
 013660  053723  013724                      BIS       VECTR,(R3)+          ; GET THE VECTOR IN STAT1.
 013664  012223                              MOV       (R2)+,(R3)+          ; GET THE STAT2 FROM DDWXX
 013666  005723                              TST       (R3)+                ; SKIP OVER STAT3
 013670  005300                              DEC       R0                   ; COUNT BY 1
 013672  001407                              BEQ       2$                   ; ALL DONE?
 013674  062737  000010  013726              ADD       #10,BASE             ; INCREMENT BASE CSR ADDRESS BY 10
 013702  062737  000010  013724              ADD       #10,VECTR            ; INCREMENT VECTOR ADDRESS BY 10
 013710  000747                              BR        1$                   ; SET THE NEXT MAP ENTRY
 013712                           2$:
```

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 013712  012603                           MOV     (SP)+,R3          ;;POP STACK INTO R3
 013714  012602                           MOV     (SP)+,R2          ;;POP STACK INTO R2
 013716  012601                           MOV     (SP)+,R1          ;;POP STACK INTO R1
 013720  012600                           MOV     (SP)+,R0          ;;POP STACK INTO R0
 013722  000207                           RTS     PC                ; RETURN
 013724  000000                   VECTR:  .WORD   0
 013726  000000                   BASE:   .WORD   0
 013730  000000                   PRIRTY: .WORD   0


                                          ;*************************** TEST 1 ***************************
                                          ;*VERIFY THAT REFERENCING UNIBUS DEVICE REGISTERS
                                          ;*DOES NOT CAUSE A TIME OUT TRAP
                                          ;:*************************************************************

                                          ;   TEST 1
                                          ;--------------

                                  ;;*************************************************************
 013732  000004                   TST1:   SCOPE
 013734  012737  000001  001202           MOV     #1,$TSTNM              ; LOAD THE NO. OF THIS TEST
 013742  012737  014042  001442           MOV     #TST2,NEXT             ; POINT TO THE START OF NEXT TEST.
 013750  012737  014002  001444           MOV     #1$,LOCK               ; ADDRESS FOR LOCK ON DATA.
                                                                    ;R1 CONTAINS BASE KMC11 ADDRESS
 013756  013701  002066                   MOV     KMCSR,R1          ;R1 CONTAINS BASE KMC11 ADDRESS
 013762  012700  000004                   MOV     #4,R0             ;4 REGISTERS TO BE TESTED
 013766  012737  014034  000004           MOV     #2$,4             ;SET UP TIMEOUT TRAP
 013774  012737  000340  000006           MOV     #340,6            ;LEVEL 7
 014002  005711                   1$:     TST     (R1)              ;REFERENCE DEVICE REGISTER
 014004  000240                           NOP
 014006  104405                           SCOP1                     ;SW09=1?
 014010  062701  000002                   ADD     #2,R1             ;NEXT REGISTER
 014014  005300                           DEC     R0                ;DEC REGISTER COUNT
 014016  001371                           BNE     1$                ;BR IF NOT LAST REGISTER
 014020  012737  000006  000004           MOV     #6,4              ;RESTORE LOC 4
 014026  005037  000006                   CLR     6                 ;RESTORE LOC 6
 014032  104420                           ADVANCE                   ; ADVANCE TO NEXT TEST
 014034  011602                   2$:     MOV     (SP),R2           ;GET PC OF TRAP
 014036  104001                           ERROR   1                 ;TIME-OUT ERROR
 014040  000002                           RTI


                                          ;*************************** TEST 2 ***************************
                                          ;*VERIFY THAT RUN CAN BE CLEARED
                                          ;:*************************************************************

                                          ;   TEST 2
                                          ;--------------

                                  ;;*************************************************************
 014042  000004                   TST2:   SCOPE
 014044  012737  000002  001202           MOV     #2,$TSTNM              ; LOAD THE NO. OF THIS TEST
 014052  012737  014072  001442           MOV     #TST3,NEXT             ; POINT TO THE START OF NEXT TEST.
                                                                    ;R1 CONTAINS BASE KMC11 ADDRESS
 014060  005011                           CLR     (R1)              ;CLEAR KMCSR
 014062  005005                           CLR     R5                ;CLEAR "EXPECTED"
 014064  011104                           MOV     (R1),R4           ;PUT KMCSR IN "FOUND"
 014066  001401                           BEQ     1$                ;BR IF CLEARED
```

```
014070  104002                          ERROR   2                       ;ERROR KMCSR NOT CLEARED
014072                          1$:


                                        ;*************************** TEST 3 ***************************
                                        ;*UNIBUS REGISTER WORD DUAL ADDRESSING TEST
                                        ;*LOAD ALL REGISTERS WITH INCREMENTING PATTERN
                                        ;*READ BACK ALL REGISTERS TO VERIFY CORRECT ADDRESSING
                                        ;:************************************************************

                                        ;   TEST 3
                                        ;--------------

                                ;;***************************************************************
014072  000004                  TST3:   SCOPE
014074  012737  000003  001202          MOV     #3,$TSTNM                       ; LOAD THE NO. OF THIS TEST
014102  012737  014222  001442          MOV     #TST4,NEXT                      ; POINT TO THE START OF NEXT TEST.
014110  012737  014124  001444          MOV     #1$,LOCK                        ; ADDRESS FOR LOCK ON DATA.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
014116  104410                          MSTCLR                          ;MASTER CLEAR KMC11
014120  012700  000001                  MOV     #1,R0                   ;START PATTERN AT 1
014124  005011                  1$:     CLR     (R1)                    ;CLEAR REGISTER
014126  010005                          MOV     R0,R5                   ;PUT DATA IN "EXPECTED"
014130  010011                          MOV     R0,(R1)                 ;WRITE KMC REGISTER WITH PATTERN
014132  011104                          MOV     (R1),R4                 ;READ KMC REGISTER INTO "FOUND"
014134  020504                          CMP     R5,R4                   ;IS DATA CORRECT
014136  001401                          BEQ     2$                      ;BR IF YES
014140  104002                          ERROR   2                       ;DATA ERROR
014142  104405                  2$:     SCOP1                           ;SW09=1?
014144  005721                          TST     (R1)+                   ;NEXT REGISTER
014146  005200                          INC     R0                      ;INCREMENT DATA PATTERN
014150  022700  000005                  CMP     #5,R0                   ;LAST REGISTER?
014154  001363                          BNE     1$                      ;BR IF NO
014156  013701  002066                  MOV     KMCSR,R1                ;BASE KMC11  ADDRESS TO R1
014162  012700  000001                  MOV     #1,R0                   ;RESTART PATTERN AT 1
014166  012737  014174  001444          MOV     #3$,LOCK                ;NEW SCOP1
014174  010005                  3$:     MOV     R0,R5                   ;PUT DATA IN "EXPECTED"
014176  011104                          MOV     (R1),R4                 ;READ KMC REGISTER INTO "FOUND"
014200  020504                          CMP     R5,R4                   ;IS DATA CORRECT
014202  001401                          BEQ     4$                      ;BR IF YES
014204  104002                          ERROR   2                       ;DUAL ADDRESSING ERROR
014206  104405                  4$:     SCOP1                           ;SW09=1?
014210  005721                          TST     (R1)+                   ;NEXT REGISTER
014212  005200                          INC     R0                      ;INCREMENT PATTERN
014214  022700  000005                  CMP     #5,R0                   ;LAST REGISTER?
014220  001365                          BNE     3$                      ;BR IF NO


                                        ;*************************** TEST 4 ***************************
                                        ;*CONTROL STATUS REGISTER WRITE/READ TEST
                                        ;*SET BIT0, VERIFY BIT0 WAS SET
                                        ;*CLEAR BIT0, VERIFY BIT0 WAS CLEARED
                                        ;:************************************************************

                                        ;   TEST 4
                                        ;--------------

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

```
014222  000004                          TST4:   SCOPE
014224  012737  000004  001202                  MOV     #4,$TSTNM               ; LOAD THE NO. OF THIS TEST
014232  012737  014320  001442                  MOV     #TST5,NEXT              ; POINT TO THE START OF NEXT TEST.
014240  012737  014250  001444                  MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
014246  104410                                  MSTCLR                          ;MASTER CLEAR KMC11
014250  013701  002066                  1$:     MOV     KMCSR,R1                ;PUT REGISTER ADDRESS IN R1
014254  012705  000001                          MOV     #BIT0,R5                ;PUT DATA IN "EXPECTED"
014260  010511                                  MOV     R5,(R1)                 ;WRITE BIT 0
014262  011104                                  MOV     (R1),R4                 ;READ CONTROL STATUS REGISTER
014264  020504                                  CMP     R5,R4                   ;IS DATA CORRECT
014266  001401                                  BEQ     2$                      ;BR IF YES
014270  104002                                  ERROR   2                       ;DATA ERROR
014272  104405                          2$:     SCOP1                           ;SW09 UP?
014274  012737  014302  001444                  MOV     #3$,LOCK                ;NEW SCOP1
014302  042711  000001                  3$:     BIC     #BIT0,(R1)              ;CLEAR BIT 0
014306  005005                                  CLR     R5                      ;CLEAR "EXPECTED"
014310  011104                                  MOV     (R1),R4                 ;READ CONTROL STATUS REGISTER
014312  001402                                  BEQ     4$                      ;BR IF ZERO
014314  104002                                  ERROR   2                       ;DATA ERROR BIT0 NOT CLEARED
014316  104405                                  SCOP1                           ;SW09 UP?
014320                                  4$:


                                                ;************************** TEST 5 **************************
                                                ;*CONTROL STATUS REGISTER WRITE/READ TEST
                                                ;*SET BIT1, VERIFY BIT1 WAS SET
                                                ;*CLEAR BIT1, VERIFY BIT1 WAS CLEARED
                                                ;:***********************************************************

                                                ;  TEST 5
                                                ;-------------

                                        ;;*****************************************************************
014320  000004                          TST5:   SCOPE
014322  012737  000005  001202                  MOV     #5,$TSTNM               ; LOAD THE NO. OF THIS TEST
014330  012737  014416  001442                  MOV     #TST6,NEXT              ; POINT TO THE START OF NEXT TEST.
014336  012737  014346  001444                  MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
014344  104410                                  MSTCLR                          ;MASTER CLEAR KMC11
014346  013701  002066                  1$:     MOV     KMCSR,R1                ;PUT REGISTER ADDRESS IN R1
014352  012705  000002                          MOV     #BIT1,R5                ;PUT DATA IN "EXPECTED"
014356  010511                                  MOV     R5,(R1)                 ;WRITE BIT 1
014360  011104                                  MOV     (R1),R4                 ;READ CONTROL STATUS REGISTER
014362  020504                                  CMP     R5,R4                   ;IS DATA CORRECT
014364  001401                                  BEQ     2$                      ;BR IF YES
014366  104002                                  ERROR   2                       ;DATA ERROR
014370  104405                          2$:     SCOP1                           ;SW09 UP?
014372  012737  014400  001444                  MOV     #3$,LOCK                ;NEW SCOP1
014400  042711  000002                  3$:     BIC     #BIT1,(R1)              ;CLEAR BIT 1
014404  005005                                  CLR     R5                      ;CLEAR "EXPECTED"
014406  011104                                  MOV     (R1),R4                 ;READ CONTROL STATUS REGISTER
014410  001402                                  BEQ     4$                      ;BR IF ZERO
014412  104002                                  ERROR   2                       ;DATA ERROR BIT1 NOT CLEARED
014414  104405                                  SCOP1                           ;SW09 UP?
014416                                  4$:


                                                ;************************** TEST 6 **************************
                                                ;*CONTROL STATUS REGISTER WRITE/READ TEST
                                                ;*SET BIT2, VERIFY BIT2 WAS SET
                                                ;*CLEAR BIT2, VERIFY BIT2 WAS CLEARED
                                                ;;*************************************************************

                                                ;  TEST 6
                                                ;--------------

                                        ;;************************************************************
014416  000004                          TST6:   SCOPE
014420  012737  000006  001202                  MOV     #6,$TSTNM               ; LOAD THE NO. OF THIS TEST
014426  012737  014514  001442                  MOV     #TST7,NEXT              ; POINT TO THE START OF NEXT TEST.
014434  012737  014444  001444                  MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
014442  104410                                  MSTCLR                         ;MASTER CLEAR KMC11
014444  013701  002066                  1$:     MOV     KMCSR,R1               ;PUT REGISTER ADDRESS IN R1
014450  012705  000004                          MOV     #BIT2,R5               ;PUT DATA IN "EXPECTED"
014454  010511                                  MOV     R5,(R1)                ;WRITE BIT 2
014456  011104                                  MOV     (R1),R4                ;READ CONTROL STATUS REGISTER
014460  020504                                  CMP     R5,R4                  ;IS DATA CORRECT
014462  001401                                  BEQ     2$                     ;BR IF YES
014464  104002                                  ERROR   2                      ;DATA ERROR
014466  104405                          2$:     SCOP1                          ;SW09 UP?
014470  012737  014476  001444                  MOV     #3$,LOCK               ;NEW SCOP1
014476  042711  000004                  3$:     BIC     #BIT2,(R1)             ;CLEAR BIT 2
014502  005005                                  CLR     R5                     ;CLEAR "EXPECTED"
014504  011104                                  MOV     (R1),R4                ;READ CONTROL STATUS REGISTER
014506  001402                                  BEQ     4$                     ;BR IF ZERO
014510  104002                                  ERROR   2                      ;DATA ERROR BIT2 NOT CLEARED
014512  104405                                  SCOP1                          ;SW09 UP?
014514                                  4$:



                                                ;*************************** TEST 7 *************************
                                                ;*CONTROL STATUS REGISTER WRITE/READ TEST
                                                ;*SET BIT5, VERIFY BIT5 WAS SET
                                                ;*CLEAR BIT5, VERIFY BIT5 WAS CLEARED
                                                ;;*************************************************************

                                                ;  TEST 7
                                                ;--------------

                                        ;;************************************************************
014514  000004                          TST7:   SCOPE
014516  012737  000007  001202                  MOV     #7,$TSTNM               ; LOAD THE NO. OF THIS TEST
014524  012737  014612  001442                  MOV     #TST10,NEXT             ; POINT TO THE START OF NEXT TEST.
014532  012737  014542  001444                  MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
014540  104410                                  MSTCLR                         ;MASTER CLEAR KMC11
014542  013701  002066                  1$:     MOV     KMCSR,R1               ;PUT REGISTER ADDRESS IN R1
014546  012705  000040                          MOV     #BIT5,R5               ;PUT DATA IN "EXPECTED"
014552  010511                                  MOV     R5,(R1)                ;WRITE BIT 5
014554  011104                                  MOV     (R1),R4                ;READ CONTROL STATUS REGISTER
014556  020504                                  CMP     R5,R4                  ;IS DATA CORRECT
014560  001401                                  BEQ     2$                     ;BR IF YES
014562  104002                                  ERROR   2                      ;DATA ERROR
014564  104405                          2$:     SCOP1                          ;SW09 UP?
014566  012737  014574  001444                  MOV     #3$,LOCK               ;NEW SCOP1
014574  042711  000040                  3$:     BIC     #BIT5,(R1)             ;CLEAR BIT 5
014600  005005                                  CLR     R5                     ;CLEAR "EXPECTED"
```

```
014602  011104                          MOV     (R1),R4                 ;READ CONTROL STATUS REGISTER
014604  001402                          BEQ     4$                      ;BR IF ZERO
014606  104002                          ERROR   2                       ;DATA ERROR BITS NOT CLEARED
014610  104405                          SCOP1                           ;SW09 UP?
014612                          4$:



                                        ;************************ TEST 10 ************************
                                        ;*CONTROL STATUS REGISTER WRITE/READ TEST
                                        ;*SET BIT6, VERIFY BIT6 WAS SET
                                        ;*CLEAR BIT6, VERIFY BIT6 WAS CLEARED
                                        ;;*******************************************************

                                        ;  TEST 10
                                        ;--------------

                                ;;***********************************************************
014612  000004                  TST10:  SCOPE
014614  012737  000010  001202          MOV     #10,$TSTNM              ; LOAD THE NO. OF THIS TEST
014622  012737  014710  001442          MOV     #TST11,NEXT             ; POINT TO THE START OF NEXT TEST.
014630  012737  014640  001444          MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
014636  104410                          MSTCLR                          ;MASTER CLEAR KMC11
014640  013701  002066          1$:     MOV     KMCSR,R1                ;PUT REGISTER ADDRESS IN R1
014644  012705  000100                  MOV     #BIT6,R5                ;PUT DATA IN "EXPECTED"
014650  010511                          MOV     R5,(R1)                 ;WRITE BIT 6
014652  011104                          MOV     (R1),R4                 ;READ CONTROL STATUS REGISTER
014654  020504                          CMP     R5,R4                   ;IS DATA CORRECT
014656  001401                          BEQ     2$                      ;BR IF YES
014660  104002                          ERROR   2                       ;DATA ERROR
014662  104405                  2$:     SCOP1                           ;SW09 UP?
014664  012737  014672  001444          MOV     #3$,LOCK                ;NEW SCOP1
014672  042711  000100          3$:     BIC     #BIT6,(R1)              ;CLEAR BIT 6
014676  005005                          CLR     R5                      ;CLEAR "EXPECTED"
014700  011104                          MOV     (R1),R4                 ;READ CONTROL STATUS REGISTER
014702  001402                          BEQ     4$                      ;BR IF ZERO
014704  104002                          ERROR   2                       ;DATA ERROR BIT6 NOT CLEARED
014706  104405                          SCOP1                           ;SW09 UP?
014710                          4$:


                                        ;************************ TEST 11 ************************
                                        ;*CONTROL STATUS REGISTER WRITE/READ TEST
                                        ;*SET BIT7, VERIFY BIT7 WAS SET
                                        ;*CLEAR BIT7, VERIFY BIT7 WAS CLEARED
                                        ;;*******************************************************

                                        ;  TEST 11
                                        ;--------------

                                ;;***********************************************************
014710  000004                  TST11:  SCOPE
014712  012737  000011  001202          MOV     #11,$TSTNM              ; LOAD THE NO. OF THIS TEST
014720  012737  015006  001442          MOV     #TST12,NEXT             ; POINT TO THE START OF NEXT TEST.
014726  012737  014736  001444          MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
014734  104410                          MSTCLR                          ;MASTER CLEAR KMC11
014736  013701  002066          1$:     MOV     KMCSR,R1                ;PUT REGISTER ADDRESS IN R1
014742  012705  000200                  MOV     #BIT7,R5                ;PUT DATA IN "EXPECTED"
014746  010511                          MOV     R5,(R1)                 ;WRITE BIT 7
```

```
014750  011104                            MOV     (R1),R4             ;READ CONTROL STATUS REGISTER
014752  020504                            CMP     R5,R4               ;IS DATA CORRECT
014754  001401                            BEQ     2$                  ;BR IF YES
014756  104002                            ERROR   2                   ;DATA ERROR
014760  104405                    2$:     SCOP1                       ;SW09 UP?
014762  012737  014770  001444            MOV     #3$,LOCK            ;NEW SCOP1
014770  042711  000200            3$:     BIC     #BIT7,(R1)          ;CLEAR BIT 7
014774  005005                            CLR     R5                  ;CLEAR "EXPECTED"
014776  011104                            MOV     (R1),R4             ;READ CONTROL STATUS REGISTER
015000  001402                            BEQ     4$                  ;BR IF ZERO
015002  104002                            ERROR   2                   ;DATA ERROR BIT7 NOT CLEARED
015004  104405                            SCOP1                       ;SW09 UP?
015006                            4$:


                                          ;************************** TEST 12 **************************
                                          ;*CONTROL STATUS REGISTER WRITE/READ TEST
                                          ;*SET BIT9, VERIFY BIT9 WAS SET
                                          ;*CLEAR BIT9, VERIFY BIT9 WAS CLEARED
                                          ;;************************************************************

                                          ;  TEST 12
                                          ;-------------

                                  ;;**************************************************************
015006  000004                    TST12:  SCOPE
015010  012737  000012  001202            MOV     #12,$TSTNM                  ; LOAD THE NO. OF THIS TEST
015016  012737  015104  001442            MOV     #TST13,NEXT                 ; POINT TO THE START OF NEXT TEST.
015024  012737  015034  001444            MOV     #1$,LOCK                    ; ADDRESS FOR LOCK ON DATA.
015032  104410                            MSTCLR                      ;MASTER CLEAR KMC11
015034  013701  002066            1$:     MOV     KMCSR,R1            ;PUT REGISTER ADDRESS IN R1
015040  012705  001000                    MOV     #BIT9,R5            ;PUT DATA IN "EXPECTED"
015044  010511                            MOV     R5,(R1)             ;WRITE BIT 9
015046  011104                            MOV     (R1),R4             ;READ CONTROL STATUS REGISTER
015050  020504                            CMP     R5,R4               ;IS DATA CORRECT
015052  001401                            BEQ     2$                  ;BR IF YES
015054  104002                            ERROR   2                   ;DATA ERROR
015056  104405                    2$:     SCOP1                       ;SW09 UP?
015060  012737  015066  001444            MOV     #3$,LOCK            ;NEW SCOP1
015066  042711  001000            3$:     BIC     #BIT9,(R1)          ;CLEAR BIT 9
015072  005005                            CLR     R5                  ;CLEAR "EXPECTED"
015074  011104                            MOV     (R1),R4             ;READ CONTROL STATUS REGISTER
015076  001402                            BEQ     4$                  ;BR IF ZERO
015100  104002                            ERROR   2                   ;DATA ERROR BIT9 NOT CLEARED
015102  104405                            SCOP1                       ;SW09 UP?
015104                            4$:


                                          ;************************** TEST 13 **************************
                                          ;*CONTROL STATUS REGISTER WRITE/READ TEST
                                          ;*SET BIT11, VERIFY BIT11 WAS SET
                                          ;*CLEAR BIT11, VERIFY BIT11 WAS CLEARED
                                          ;;************************************************************

                                          ;  TEST 13
                                          ;-------------

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

```
015104  000004                  TST13:  SCOPE
015106  012737  000013  001202          MOV     #13,$TSTNM              ; LOAD THE NO. OF THIS TEST
015114  012737  015202  001442          MOV     #TST14,NEXT             ; POINT TO THE START OF NEXT TEST.
015122  012737  015132  001444          MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
015130  104410                          MSTCLR                  ;MASTER CLEAR KMC11
015132  013701  002066          1$:     MOV     KMCSR,R1        ;PUT REGISTER ADDRESS IN R1
015136  012705  004000                  MOV     #BIT11,R5       ;PUT DATA IN "EXPECTED"
015142  010511                          MOV     R5,(R1)         ;WRITE BIT 11
015144  011104                          MOV     (R1),R4         ;READ CONTROL STATUS REGISTER
015146  020504                          CMP     R5,R4           ;IS DATA CORRECT
015150  001401                          BEQ     2$              ;BR IF YES
015152  104002                          ERROR   2               ;DATA ERROR
015154  104405                  2$:     SCOP1                   ;SW09 UP?
015156  012737  015164  001444          MOV     #3$,LOCK        ;NEW SCOP1
015164  042711  004000          3$:     BIC     #BIT11,(R1)     ;CLEAR BIT 11
015170  005005                          CLR     R5              ;CLEAR "EXPECTED"
015172  011104                          MOV     (R1),R4         ;READ CONTROL STATUS REGISTER
015174  001402                          BEQ     4$              ;BR IF ZERO
015176  104002                          ERROR   2               ;DATA ERROR BIT11 NOT CLEARED
015200  104405                          SCOP1                   ;SW09 UP?
015202                          4$:


                                        ;************************** TEST 14 **************************
                                        ;*CONTROL STATUS REGISTER WRITE/READ TEST
                                        ;*SET BIT12, VERIFY BIT12 WAS SET
                                        ;*CLEAR BIT12, VERIFY BIT12 WAS CLEARED
                                        ;:*************************************************************

                                        ;  TEST 14
                                        ;-------------

                                ;;*************************************************************
015202  000004                  TST14:  SCOPE
015204  012737  000014  001202          MOV     #14,$TSTNM              ; LOAD THE NO. OF THIS TEST
015212  012737  015300  001442          MOV     #TST15,NEXT             ; POINT TO THE START OF NEXT TEST.
015220  012737  015230  001444          MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
015226  104410                          MSTCLR                  ;MASTER CLEAR KMC11
015230  013701  002066          1$:     MOV     KMCSR,R1        ;PUT REGISTER ADDRESS IN R1
015234  012705  010000                  MOV     #BIT12,R5       ;PUT DATA IN "EXPECTED"
015240  010511                          MOV     R5,(R1)         ;WRITE BIT 12
015242  011104                          MOV     (R1),R4         ;READ CONTROL STATUS REGISTER
015244  020504                          CMP     R5,R4           ;IS DATA CORRECT
015246  001401                          BEQ     2$              ;BR IF YES
015250  104002                          ERROR   2               ;DATA ERROR
015252  104405                  2$:     SCOP1                   ;SW09 UP?
015254  012737  015262  001444          MOV     #3$,LOCK        ;NEW SCOP1
015262  042711  010000          3$:     BIC     #BIT12,(R1)     ;CLEAR BIT 12
015266  005005                          CLR     R5              ;CLEAR "EXPECTED"
015270  011104                          MOV     (R1),R4         ;READ CONTROL STATUS REGISTER
015272  001402                          BEQ     4$              ;BR IF ZERO
015274  104002                          ERROR   2               ;DATA ERROR BIT12 NOT CLEARED
015276  104405                          SCOP1                   ;SW09 UP?
015300                          4$:


                                        ;************************** TEST 15 **************************
```

```
                                                ;*CONTROL OUT REGISTER WRITE/READ TEST
                                                ;*SET BIT0, VERIFY BIT0 WAS SET
                                                ;*CLEAR BIT0, VERIFY BIT0 WAS CLEARED
                                                ;:*******************************************************

                                                ;  TEST 15
                                                ;--------------

                                        ;;*******************************************************
015300  000004                          TST15:  SCOPE
015302  012737  000015  001202                  MOV     #15,$TSTNM              ; LOAD THE NO. OF THIS TEST
015310  012737  015376  001442                  MOV     #TST16,NEXT             ; POINT TO THE START OF NEXT TEST.
015316  012737  015326  001444                  MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
015324  104410                                  MSTCLR                  ;MASTER CLEAR KMC11
015326  013701  002072                  1$:     MOV     KMCTL,R1        ;PUT REGISTER ADDRESS IN R1
015332  012705  000001                          MOV     #BIT0,R5        ;PUT DATA IN "EXPECTED"
015336  010511                                  MOV     R5,(R1)         ;WRITE BIT 0
015340  011104                                  MOV     (R1),R4         ;READ CONTROL OUT REGISTER
015342  020504                                  CMP     R5,R4           ;IS DATA CORRECT
015344  001401                                  BEQ     2$              ;BR IF YES
015346  104002                                  ERROR   2               ;DATA ERROR
015350  104405                          2$:     SCOP1                   ;SW09 UP?
015352  012737  015360  001444                  MOV     #3$,LOCK        ;NEW SCOP1
015360  042711  000001                  3$:     BIC     #BIT0,(R1)      ;CLEAR BIT 0
015364  005005                                  CLR     R5              ;CLEAR "EXPECTED"
015366  011104                                  MOV     (R1),R4         ;READ CONTROL OUT REGISTER
015370  001402                                  BEQ     4$              ;BR IF ZERO
015372  104002                                  ERROR   2               ;DATA ERROR BIT0 NOT CLEARED
015374  104405                                  SCOP1                   ;SW09 UP?
015376                                  4$:


                                                ;************************** TEST 16 **************************
                                                ;*CONTROL OUT REGISTER WRITE/READ TEST
                                                ;*SET BIT1, VERIFY BIT1 WAS SET
                                                ;*CLEAR BIT1, VERIFY BIT1 WAS CLEARED
                                                ;:*******************************************************

                                                ;  TEST 16
                                                ;--------------

                                        ;;*******************************************************
015376  000004                          TST16:  SCOPE
015400  012737  000016  001202                  MOV     #16,$TSTNM              ; LOAD THE NO. OF THIS TEST
015406  012737  015474  001442                  MOV     #TST17,NEXT             ; POINT TO THE START OF NEXT TEST.
015414  012737  015424  001444                  MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
015422  104410                                  MSTCLR                  ;MASTER CLEAR KMC11
015424  013701  002072                  1$:     MOV     KMCTL,R1        ;PUT REGISTER ADDRESS IN R1
015430  012705  000002                          MOV     #BIT1,R5        ;PUT DATA IN "EXPECTED"
015434  010511                                  MOV     R5,(R1)         ;WRITE BIT 1
015436  011104                                  MOV     (R1),R4         ;READ CONTROL OUT REGISTER
015440  020504                                  CMP     R5,R4           ;IS DATA CORRECT
015442  001401                                  BEQ     2$              ;BR IF YES
015444  104002                                  ERROR   2               ;DATA ERROR
015446  104405                          2$:     SCOP1                   ;SW09 UP?
015450  012737  015456  001444                  MOV     #3$,LOCK        ;NEW SCOP1
015456  042711  000002                  3$:     BIC     #BIT1,(R1)      ;CLEAR BIT 1
015462  005005                                  CLR     R5              ;CLEAR "EXPECTED"
```

```
015464  011104                          MOV     (R1),R4                 ;READ CONTROL OUT REGISTER
015466  001402                          BEQ     4$                      ;BR IF ZERO
015470  104002                          ERROR   2                       ;DATA ERROR BIT1 NOT CLEARED
015472  104405                          SCOP1                           ;SW09 UP?
015474                          4$:



                                        ;*************************** TEST 17 ***************************
                                        ;*CONTROL OUT REGISTER WRITE/READ TEST
                                        ;*SET BIT2, VERIFY BIT2 WAS SET
                                        ;*CLEAR BIT2, VERIFY BIT2 WAS CLEARED
                                        ;:****************************************************************

                                        ;  TEST 17
                                        ;_____________

                                ;:*************************************************************
015474  000004                  TST17:  SCOPE
015476  012737  000017  001202          MOV     #17,$TSTNM                      ; LOAD THE NO. OF THIS TEST
015504  012737  015572  001442          MOV     #TST20,NEXT                     ; POINT TO THE START OF NEXT TEST.
015512  012737  015522  001444          MOV     #1$,LOCK                        ; ADDRESS FOR LOCK ON DATA.
015520  104410                          MSTCLR                          ;MASTER CLEAR KMC11
015522  013701  002072          1$:     MOV     KMCTL,R1                ;PUT REGISTER ADDRESS IN R1
015526  012705  000004                  MOV     #BIT2,R5                ;PUT DATA IN "EXPECTED"
015532  010511                          MOV     R5,(R1)                 ;WRITE BIT 2
015534  011104                          MOV     (R1),R4                 ;READ CONTROL OUT REGISTER
015536  020504                          CMP     R5,R4                   ;IS DATA CORRECT
015540  001401                          BEQ     2$                      ;BR IF YES
015542  104002                          ERROR   2                       ;DATA ERROR
015544  104405                  2$:     SCOP1                           ;SW09 UP?
015546  012737  015554  001444          MOV     #3$,LOCK                ;NEW SCOP1
015554  042711  000004          3$:     BIC     #BIT2,(R1)              ;CLEAR BIT 2
015560  005005                          CLR     R5                      ;CLEAR "EXPECTED"
015562  011104                          MOV     (R1),R4                 ;READ CONTROL OUT REGISTER
015564  001402                          BEQ     4$                      ;BR IF ZERO
015566  104002                          ERROR   2                       ;DATA ERROR BIT2 NOT CLEARED
015570  104405                          SCOP1                           ;SW09 UP?
015572                          4$:



                                        ;*************************** TEST 20 ***************************
                                        ;*CONTROL OUT REGISTER WRITE/READ TEST
                                        ;*SET BIT6, VERIFY BIT6 WAS SET
                                        ;*CLEAR BIT6, VERIFY BIT6 WAS CLEARED
                                        ;:****************************************************************

                                        ;  TEST 20
                                        ;_____________

                                ;:*************************************************************
015572  000004                  TST20:  SCOPE
015574  012737  000020  001202          MOV     #20,$TSTNM                      ; LOAD THE NO. OF THIS TEST
015602  012737  015670  001442          MOV     #TST21,NEXT                     ; POINT TO THE START OF NEXT TEST.
015610  012737  015620  001444          MOV     #1$,LOCK                        ; ADDRESS FOR LOCK ON DATA.
015616  104410                          MSTCLR                          ;MASTER CLEAR KMC11
015620  013701  002072          1$:     MOV     KMCTL,R1                ;PUT REGISTER ADDRESS IN R1
015624  012705  000100                  MOV     #BIT6,R5                ;PUT DATA IN "EXPECTED"
015630  010511                          MOV     R5,(R1)                 ;WRITE BIT 6
```

```
015632  011104                            MOV     (R1),R4            ;READ CONTROL OUT REGISTER
015634  020504                            CMP     R5,R4              ;IS DATA CORRECT
015636  001401                            BEQ     2$                 ;BR IF YES
015640  104002                            ERROR   2                  ;DATA ERROR
015642  104405                    2$:     SCOP1                      ;SW09 UP?
015644  012737  015652  001444            MOV     #3$,LOCK           ;NEW SCOP1
015652  042711  000100            3$:     BIC     #BIT6,(R1)         ;CLEAR BIT 6
015656  005005                            CLR     R5                 ;CLEAR "EXPECTED"
015660  011104                            MOV     (R1),R4            ;READ CONTROL OUT REGISTER
015662  001402                            BEQ     4$                 ;BR IF ZERO
015664  104002                            ERROR   2                  ;DATA ERROR BIT6 NOT CLEARED
015666  104405                            SCOP1                      ;SW09 UP?
015670                            4$:



                                          ;************************** TEST 21 **************************
                                          ;*CONTROL OUT REGISTER WRITE/READ TEST
                                          ;*SET BIT7, VERIFY BIT7 WAS SET
                                          ;*CLEAR BIT7, VERIFY BIT7 WAS CLEARED
                                          ;:************************************************************

                                          ;  TEST 21
                                          ;--------------

                                  ;;************************************************************
015670  000004                    TST21:  SCOPE
015672  012737  000021  001202            MOV     #21,$TSTNM               ; LOAD THE NO. OF THIS TEST
015700  012737  015766  001442            MOV     #TST22,NEXT              ; POINT TO THE START OF NEXT TEST.
015706  012737  015716  001444            MOV     #1$,LOCK                 ; ADDRESS FOR LOCK ON DATA.
015714  104410                            MSTCLR                     ;MASTER CLEAR KMC11
015716  013701  002072            1$:     MOV     KMCTL,R1           ;PUT REGISTER ADDRESS IN R1
015722  012705  000200                    MOV     #BIT7,R5           ;PUT DATA IN "EXPECTED"
015726  010511                            MOV     R5,(R1)            ;WRITE BIT 7
015730  011104                            MOV     (R1),R4            ;READ CONTROL OUT REGISTER
015732  020504                            CMP     R5,R4              ;IS DATA CORRECT
015734  001401                            BEQ     2$                 ;BR IF YES
015736  104002                            ERROR   2                  ;DATA ERROR
015740  104405                    2$:     SCOP1                      ;SW09 UP?
015742  012737  015750  001444            MOV     #3$,LOCK           ;NEW SCOP1
015750  042711  000200            3$:     BIC     #BIT7,(R1)         ;CLEAR BIT 7
015754  005005                            CLR     R5                 ;CLEAR "EXPECTED"
015756  011104                            MOV     (R1),R4            ;READ CONTROL OUT REGISTER
015760  001402                            BEQ     4$                 ;BR IF ZERO
015762  104002                            ERROR   2                  ;DATA ERROR BIT7 NOT CLEARED
015764  104405                            SCOP1                      ;SW09 UP?
015766                            4$:



                                          ;************************** TEST 22 **************************
                                          ;*CONTROL OUT REGISTER WRITE/READ TEST
                                          ;*SET BIT12, VERIFY BIT12 WAS SET
                                          ;*CLEAR BIT12, VERIFY BIT12 WAS CLEARED
                                          ;:************************************************************

                                          ;  TEST 22
                                          ;--------------
                                  ;;************************************************************
```

```
015766  000004                          TST22:  SCOPE
015770  012737  000022  001202                  MOV     #22,$TSTNM              ; LOAD THE NO. OF THIS TEST
015776  012737  016064  001442                  MOV     #TST23,NEXT             ; POINT TO THE START OF NEXT TEST.
016004  012737  016014  001444                  MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
016012  104410                                  MSTCLR                  ;MASTER CLEAR KMC11
016014  013701  002072                  1$:     MOV     KMCTL,R1        ;PUT REGISTER ADDRESS IN R1
016020  012705  010000                          MOV     #BIT12,R5       ;PUT DATA IN "EXPECTED"
016024  010511                                  MOV     R5,(R1)         ;WRITE BIT 12
016026  011104                                  MOV     (R1),R4         ;READ CONTROL OUT REGISTER
016030  020504                                  CMP     R5,R4           ;IS DATA CORRECT
016032  001401                                  BEQ     2$              ;BR IF YES
016034  104002                                  ERROR   2               ;DATA ERROR
016036  104405                          2$:     SCOP1                   ;SW09 UP?
016040  012737  016046  001444                  MOV     #3$,LOCK        ;NEW SCOP1
016046  042711  010000                  3$:     BIC     #BIT12,(R1)     ;CLEAR BIT 12
016052  005005                                  CLR     R5              ;CLEAR "EXPECTED"
016054  011104                                  MOV     (R1),R4         ;READ CONTROL OUT REGISTER
016056  001402                                  BEQ     4$              ;BR IF ZERO
016060  104002                                  ERROR   2               ;DATA ERROR BIT12 NOT CLEARED
016062  104405                                  SCOP1                   ;SW09 UP?
016064                                  4$:


                                                ;*************************** TEST 23 **************************
                                                ;*CONTROL OUT REGISTER WRITE/READ TEST
                                                ;*SET BIT13, VERIFY BIT13 WAS SET
                                                ;*CLEAR BIT13, VERIFY BIT13 WAS CLEARED
                                                ;;*************************************************************

                                                ;  TEST 23
                                                ;_____________

                                        ;;*****************************************************************
016064  000004                          TST23:  SCOPE
016066  012737  000023  001202                  MOV     #23,$TSTNM              ; LOAD THE NO. OF THIS TEST
016074  012737  016162  001442                  MOV     #TST24,NEXT             ; POINT TO THE START OF NEXT TEST.
016102  012737  016112  001444                  MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
016110  104410                                  MSTCLR                  ;MASTER CLEAR KMC11
016112  013701  002072                  1$:     MOV     KMCTL,R1        ;PUT REGISTER ADDRESS IN R1
016116  012705  020000                          MOV     #BIT13,R5       ;PUT DATA IN "EXPECTED"
016122  010511                                  MOV     R5,(R1)         ;WRITE BIT 13
016124  011104                                  MOV     (R1),R4         ;READ CONTROL OUT REGISTER
016126  020504                                  CMP     R5,R4           ;IS DATA CORRECT
016130  001401                                  BEQ     2$              ;BR IF YES
016132  104002                                  ERROR   2               ;DATA ERROR
016134  104405                          2$:     SCOP1                   ;SW09 UP?
016136  012737  016144  001444                  MOV     #3$,LOCK        ;NEW SCOP1
016144  042711  020000                  3$:     BIC     #BIT13,(R1)     ;CLEAR BIT 13
016150  005005                                  CLR     R5              ;CLEAR "EXPECTED"
016152  011104                                  MOV     (R1),R4         ;READ CONTROL OUT REGISTER
016154  001402                                  BEQ     4$              ;BR IF ZERO
016156  104002                                  ERROR   2               ;DATA ERROR BIT13 NOT CLEARED
016160  104405                                  SCOP1                   ;SW09 UP?
016162                                  4$:


                                                ;*************************** TEST 24 **************************
                                                ;*PORT4 REGISTER WRITE/READ TEST
                                                ;*FLOAT A ONE THROUGH PORT4 REGISTER
                                                ;*FLOAT A ZERO THROUGH PORT4 REGISTER
                                                ;:*******************************************************

                                                ;  TEST 24
                                                ;--------------

                                        ::******************************************************
016162  000004                          TST24:  SCOPE
016164  012737  000024  001202                  MOV     #24,$TSTNM              ; LOAD THE NO. OF THIS TEST
016172  012737  016306  001442                  MOV     #TST25,NEXT             ; POINT TO THE START OF NEXT TEST.
016200  012737  016220  001444                  MOV     #64$,LOCK               ; ADDRESS FOR LOCK ON DATA.
016206  104410                                  MSTCLR                          ;MASTER CLEAR KMC11
016210  013701  002074                          MOV     KMP04,R1                ;PUT REGISTER ADDRESS IN R1
016214  012700  000001                          MOV     #1,R0                   ;START WITH BIT0
016220                                  64$:
016220  010005                                  MOV     R0,R5                   ;PUT "EXPECTED" IN R5
016222  010511                                  MOV     R5,(R1)                 ;WRITE PORT4 REGISTER
016224  011104                                  MOV     (R1),R4                 ;READ PORT4 REGISTER
016226  020504                                  CMP     R5,R4                   ;COMPARE EXPECTED AND FOUND
016230  001401                                  BEQ     65$                     ;BR IF OK
016232  104002                                  ERROR   2                       ;WRITE/READ ERROR
016234  104405                          65$:    SCOP1                           ;LOOP TO 64$ IF SW09=1
016236  000241                                  CLC                             ;CLEAR CARRY
016240  006100                                  ROL     R0                      ;SHIFT TO NEXT BIT
016242  001366                                  BNE     64$                     ;BR IF NOT DONE YET?
016244  012737  016256  001444                  MOV     #66$,LOCK               ;NEW SCOP1
016252  012700  000001                          MOV     #1,R0                   ;START WITH BIT0
016256                                  66$:
016256  005100                                  COM     R0                      ;CHANGE TO A FLOATING ZERO
016260  010005                                  MOV     R0,R5                   ;PUT "EXPECTED" IN R5
016262  010511                                  MOV     R5,(R1)                 ;WRITE PORT4 REGISTER
016264  011104                                  MOV     (R1),R4                 ;READ PORT4 REGISTER
016266  020504                                  CMP     R5,R4                   ;COMPARE EXPECTED AND FOUND
016270  001401                                  BEQ     67$                     ;BR IF OK
016272  104002                                  ERROR   2                       ;WRITE/READ ERROR
016274  104405                          67$:    SCOP1                           ;LOOP TO 66$ IF SW09=1
016276  005100                                  COM     R0                      ;CHANGE BACK TO A FLOATING ONE
016300  000241                                  CLC                             ;CLEAR CARRY
016302  006100                                  ROL     R0                      ;SHIFT TO NEXT BIT
016304  001364                                  BNE     66$                     ;BR IF NOT DONE YET?


                                                ;************************** TEST 25 **************************
                                                ;*PORT6 REGISTER WRITE/READ TEST
                                                ;*FLOAT A ONE THROUGH PORT6 REGISTER
                                                ;*FLOAT A ZERO THROUGH PORT6 REGISTER
                                                ;:*******************************************************

                                                ;  TEST 25
                                                ;--------------

                                        ::******************************************************
016306  000004                          TST25:  SCOPE
016310  012737  000025  001202                  MOV     #25,$TSTNM              ; LOAD THE NO. OF THIS TEST
016316  012737  016432  001442                  MOV     #TST26,NEXT             ; POINT TO THE START OF NEXT TEST.
016324  012737  016344  001444                  MOV     #64$,LOCK               ; ADDRESS FOR LOCK ON DATA.
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016332  104410                                  MSTCLR                          ;MASTER CLEAR KMC11
016334  013701  002076                          MOV     KMP06,R1                ;PUT REGISTER ADDRESS IN R1
016340  012700  000001                          MOV     #1,R0                   ;START WITH BIT0
016344                                  64$:
016344  010005                                  MOV     R0,R5                   ;PUT "EXPECTED" IN R5
016346  010511                                  MOV     R5,(R1)                 ;WRITE PORT6 REGISTER
016350  011104                                  MOV     (R1),R4                 ;READ PORT6 REGISTER
016352  020504                                  CMP     R5,R4                   ;COMPARE EXPECTED AND FOUND
016354  001401                                  BEQ     65$                     ;BR IF OK
016356  104002                                  ERROR   2                       ;WRITE/READ ERROR
016360  104405                          65$:    SCOP1                           ;LOOP TO 64$ IF SW09=1
016362  000241                                  CLC                             ;CLEAR CARRY
016364  006100                                  ROL     R0                      ;SHIFT TO NEXT BIT
016366  001366                                  BNE     64$                     ;BR IF NOT DONE YET?
016370  012737  016402  001444                  MOV     #66$,LOCK               ;NEW SCOP1
016376  012700  000001                          MOV     #1,R0                   ;START WITH BIT0
016402                                  66$:
016402  005100                                  COM     R0                      ;CHANGE TO A FLOATING ZERO
016404  010005                                  MOV     R0,R5                   ;PUT "EXPECTED" IN R5
016406  010511                                  MOV     R5,(R1)                 ;WRITE PORT6 REGISTER
016410  011104                                  MOV     (R1),R4                 ;READ PORT6 REGISTER
016412  020504                                  CMP     R5,R4                   ;COMPARE EXPECTED AND FOUND
016414  001401                                  BEQ     67$                     ;BR IF OK
016416  104002                                  ERROR   2                       ;WRITE/READ ERROR
016420  104405                          67$:    SCOP1                           ;LOOP TO 66$ IF SW09=1
016422  005100                                  COM     R0                      ;CHANGE BACK TO A FLOATING ONE
016424  000241                                  CLC                             ;CLEAR CARRY
016426  006100                                  ROL     R0                      ;SHIFT TO NEXT BIT
016430  001364                                  BNE     66$                     ;BR IF NOT DONE YET?


                                                ;************************ TEST 26 ***************************
                                                ;*UNIBUS REGISTER BYTE DUAL ADDRESSING TEST
                                                ;*LOAD ALL REGISTERS WITH INCREMENTING PATTERN
                                                ;*READ BACK ALL REGISTERS TO VERIFY CORRECT ADDRESSING
                                                ;:***********************************************************

                                                ;  TEST 26
                                                ;_____________

                                        ;;*************************************************************
016432  000004                          TST26:  SCOPE
016434  012737  000026  001202                  MOV     #26,$TSTNM                      ; LOAD THE NO. OF THIS TEST
016442  012737  016562  001442                  MOV     #TST27,NEXT                     ; POINT TO THE START OF NEXT TEST.
016450  012737  016464  001444                  MOV     #1$,LOCK                        ; ADDRESS FOR LOCK ON DATA.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
016456  104410                                  MSTCLR                  ;MASTER CLEAR KMC11
016460  012700  000001                          MOV     #1,R0           ;START PATTERN AT 1
016464  105011                          1$:     CLRB    (R1)            ;CLEAR REGISTER
016466  110005                                  MOVB    R0,R5           ;PUT DATA IN "EXPECTED"
016470  110011                                  MOVB    R0,(R1)         ;WRITE KMC REGISTER WITH PATTERN
016472  111104                                  MOVB    (R1),R4         ;READ KMC REGISTER INTO "FOUND"
016474  020504                                  CMP     R5,R4           ;IS DATA CORRECT
016476  001401                                  BEQ     2$              ;BR IF YES
016500  104002                                  ERROR   2               ;DATA ERROR
016502  104405                          2$:     SCOP1                   ;SW09=1?
016504  105721                                  TSTB    (R1)+           ;NEXT REGISTER
```

```
016506  005200                           INC     R0                      ;INCREMENT DATA PATTERN
016510  022700  000011                   CMP     #11,R0                  ;LAST REGISTER?
016514  001363                           BNE     1$                      ;BR IF NO
016516  013701  002066                   MOV     KMCSR,R1                ;BASE KMC11  ADDRESS TO R1
016522  012700  000001                   MOV     #1,R0                   ;RESTART PATTERN AT 1
016526  012737  016534  001444           MOV     #3$,LOCK                ;NEW SCOP1
016534  110005                   3$:     MOVB    R0,R5                   ;PUT DATA IN "EXPECTED"
016536  111104                           MOVB    (R1),R4                 ;READ KMC REGISTER INTO "FOUND"
016540  020504                           CMP     R5,R4                   ;IS DATA CORRECT
016542  001401                           BEQ     4$                      ;BR IF YES
016544  104002                           ERROR   2                       ;DUAL ADDRESSING ERROR
016546  104405                   4$:     SCOP1                           ;SW09=1?
016550  105721                           TSTB    (R1)+                   ;NEXT REGISTER
016552  005200                           INC     R0                      ;INCREMENT PATTERN
016554  022700  000011                   CMP     #11,R0                  ;LAST REGISTER?
016560  001365                           BNE     3$                      ;BR IF NO


                                         ;*************************** TEST 27 ***************************
                                         ;*MAINTENANCE INSTRUCTION REGISTER TEST
                                         ;*VERIFY THAT THE MAINT IR CAN BE WRITTEN TO ALL ZEROS'
                                         ;*AND ALL ONES'. VERIFY THAT IT IS CLEARED ON A BUS RESET.
                                         ;;**************************************************************

                                         ;  TEST 27
                                         ;--------------
                                 ;;*******************************************************************
016562  000004                   TST27:  SCOPE
016564  012737  000027  001202           MOV     #27,$TSTNM                       ; LOAD THE NO. OF THIS TEST
016572  012737  016722  001442           MOV     #TST30,NEXT                      ; POINT TO THE START OF NEXT TEST.
016600  012737  016616  001444           MOV     #1$,LOCK                         ; ADDRESS FOR LOCK ON DATA.
                                                                         ;R1 CONTAINS BASE KMC11 ADDRESS
016606  104410                           MSTCLR                          ;MASTER CLEAR KMC11
016610  012711  003000                   MOV     #BIT9!BIT10,(R1)        ;SEL6 IS NOW THE IR
016614  005005                           CLR     R5                      ;PUT "EXPECTED" IN R5
016616  010561  000006           1$:     MOV     R5,6(R1)                ;CLEAR THE IR
016622  016104  000006                   MOV     6(R1),R4                ;READ THE IR
016626  020504                           CMP     R5,R4                   ;IS IT CLEARED?
016630  001401                           BEQ     2$                      ;BR IF YES
016632  104023                           ERROR   23                      ;ERROR IR IS NOT CLEAR
016634  104405                   2$:     SCOP1                           ;LOOP TO 1$ IF SW09=1
016636  012737  016650  001444           MOV     #3$,LOCK                ;NEW SCOP1
016644  012705  177777                   MOV     #-1,R5                  ;PUT "EXPECTED" IN R5
016650  010561  000006           3$:     MOV     R5,6(R1)                ;WRITE ALL ONES TO THE IR
016654  016104  000006                   MOV     6(R1),R4                ;READ THE IR
016660  020504                           CMP     R5,R4                   ;IS IT ALL ONES?
016662  001401                           BEQ     4$                      ;BR IF YES
016664  104023                           ERROR   23                      ;ERROR IR IS NOT = ALL ONES
016666  104405                   4$:     SCOP1                           ;LOOP TO 3$ IF SW09=1
016670  012737  016700  001444           MOV     #5$,LOCK                ;NEW SCOP1
016676  005005                           CLR     R5                      ;PUT "EXPECTED" IN R5
016700  000005                   5$:     RESET                           ;BUS RESET
016702  012711  003000                   MOV     #BIT9!BIT10,(R1)        ;SEL6 IS IR
016706  016104  000006                   MOV     6(R1),R4                ;READ THE IR
016712  020504                           CMP     R5,R4                   ;IS IT CLEARED?
016714  001401                           BEQ     6$                      ;BR IF YES
```

```
016716  104023                        ERROR   23                      ;ERROR, IR IS NOT CLEARED
016720  104405                6$:     SCOP1                           ;LOOP TO 5$ IF SW09=1


                                      ;************************** TEST 30 **************************
                                      ;*MAINTENANCE INSTRUCTION REGISTER TEST
                                      ;*VERIFY THAT THE MAINT IR CAN BE WRITTEN TO ALL ZEROS'
                                      ;*AND ALL ONES'. VERIFY THAT IT IS CLEARED ON A MASTER RESET.
                                      ;;*************************************************************

                                      ;  TEST 30
                                      ;-------------
                              ;;*************************************************************
016722  000004                TST30:  SCOPE
016724  012737  000030  001202        MOV     #30,$TSTNM                      ; LOAD THE NO. OF THIS TEST
016732  012737  017064  001442        MOV     #TST31,NEXT                     ; POINT TO THE START OF NEXT TEST.
016740  012737  016756  001444        MOV     #1$,LOCK                        ; ADDRESS FOR LOCK ON DATA.
                                                                      ;R1 CONTAINS BASE KMC11 ADDRESS
016746  104410                        MSTCLR                          ;MASTER CLEAR KMC11
016750  012711  003000                MOV     #BIT9!BIT10,(R1)        ;SEL6 IS NOW THE IR
016754  005005                        CLR     R5                      ;PUT "EXPECTED" IN R5
016756  010561  000006        1$:     MOV     R5,6(R1)                ;CLEAR THE IR
016762  016104  000006                MOV     6(R1),R4                ;READ THE IR
016766  020504                        CMP     R5,R4                   ;IS IT CLEARED?
016770  001401                        BEQ     2$                      ;BR IF YES
016772  104023                        ERROR   23                      ;ERROR IR IS NOT CLEAR
016774  104405                2$:     SCOP1                           ;LOOP TO 1$ IF SW09=1
016776  012737  017010  001444        MOV     #3$,LOCK                ;NEW SCOP1
017004  012705  177777                MOV     #-1,R5                  ;PUT "EXPECTED" IN R5
017010  010561  000006        3$:     MOV     R5,6(R1)                ;WRITE ALL ONES TO THE IR
017014  016104  000006                MOV     6(R1),R4                ;READ THE IR
017020  020504                        CMP     R5,R4                   ;IS IT ALL ONES?
017022  001401                        BEQ     4$                      ;BR IF YES
017024  104023                        ERROR   23                      ;ERROR IR IS NOT = ALL ONES
017026  104405                4$:     SCOP1                           ;LOOP TO 3$ IF SW09=1
017030  012737  017040  001444        MOV     #5$,LOCK                ;NEW SCOP1
017036  005005                        CLR     R5                      ;PUT "EXPECTED" IN R5
017040  052711  040000        5$:     BIS     #BIT14,(R1)             ;MASTER CLEAR
017044  012711  003000                MOV     #BIT9!BIT10,(R1)        ;SEL6 IS IR
017050  016104  000006                MOV     6(R1),R4                ;READ THE IR
017054  020504                        CMP     R5,R4                   ;IS IT CLEARED?
017056  001401                        BEQ     6$                      ;BR IF YES
017060  104023                        ERROR   23                      ;ERROR, IR IS NOT CLEARED
017062  104405                6$:     SCOP1                           ;LOOP TO 5$ IF SW09=1


                                      ;************************** TEST 31 **************************
                                      ;*MICRO PROCESSOR TEST
                                      ;*LOAD KMP06 WITH A MICRO-PROCESSOR INSTRUCTION, CLOCK IT
                                      ;*VERIFY INSTRUCTION EXECUTED PROPERLY
                                      ;*INSTRUCTION SHOULD MOVE IBUS*4 TO IBUS*5. IBUS*4 IS ALL 1'S
                                      ;*AND IBUS*5 IS ALL 0'S. RESULT SHOULD BE ALL 1'S IN SEL4
                                      ;;*************************************************************

                                      ;  TEST 31
                                      ;-------------
                                      ;;*************************************************************
017064  000004                        TST31:  SCOPE
017066  012737  000031  001202                MOV     #31,$TSTNM              ; LOAD THE NO. OF THIS TEST
017074  012737  017150  001442                MOV     #TST32,NEXT             ; POINT TO THE START OF NEXT TEST.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
017102  104410                                MSTCLR                    ;MASTER CLEAR KMC11
017104  012761  000377  000004                MOV     #377,4(R1)        ;PORT4 HI-BYTE=0'S LO-BYTE=1'S
017112  012711  001000                        MOV     #BIT9,(R1)        ;SET ROMI
017116  012761  121105  000006                MOV     #121105,6(R1)     ;INSTRUCTION TO PORT6
017124  052711  001400                        BIS     #BIT8!BIT9,(R1)   ;CLK INTSRUCTION, MOVE IBUS*4 TO IBUS*5
017130  000240                                NOP
017132  012705  177777                        MOV     #-1,R5            ;PUT "EXPECTED" IN R5
017136  016104  000004                        MOV     4(R1),R4          ;PUT "FOUND" INTO R4
017142  020504                                CMP     R5,R4             ;IS DATA CORRECT
017144  001401                                BEQ     1$                ;BR IF YES
017146  104003                                ERROR   3                 ;ERROR
017150                                1$:



                                              ;*************************** TEST 32 ***************************
                                              ;*MICRO PROCESSOR IBUS* REGISTER WRITE/READ TEST
                                              ;*FLOAT A 1 THROUGH IBUS* REGISTER 0
                                              ;*FLOAT A 0 THROUGH IBUS* REGISTER 0
                                              ;;*************************************************************

                                              ;  TEST 32
                                              ;-------------

                                      ;;*************************************************************
017150  000004                        TST32:  SCOPE
017152  012737  000032  001202                MOV     #32,$TSTNM              ; LOAD THE NO. OF THIS TEST
017160  012737  017350  001442                MOV     #TST33,NEXT             ; POINT TO THE START OF NEXT TEST.
017166  012737  017206  001444                MOV     #64$,LOCK               ; ADDRESS FOR LOCK ON DATA.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
017174  104410                                MSTCLR                    ;MASTER CLEAR KMC11
017176  012702  000000                        MOV     #0,R2             ;SAVE REGISTER ADDRESS FOR TYPEOUT
017202  012700  000001                        MOV     #1,R0             ;START WITH BIT 0
017206                                64$:
017206  010061  000004                        MOV     R0,4(R1)          ;PUT PATTERN INTO PORT4
017212  042761  000030  000004                BIC     #30,4(R1)         ;CLEAR UNWANTED BITS
017220  104412                                ROMCLK                    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
017222  121100                                121100!0                  ;MOV DATA TO IBUS* REGISTER 0
017224  104412                                ROMCLK                    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
017226  121005                                121005!<0*20>             ;READ FROM IBUS* REGISTER 0
017230  010005                                MOV     R0,R5             ;PUT EXPECTED IN R5
017232  042705  000030                        BIC     #30,R5            ;CLEAR UNWANTED BITS
017236  116104  000005                        MOVB    5(R1),R4          ;PUT "FOUND" INTO R4
017242  120504                                CMPB    R5,R4             ;DATA CORRECT?
017244  001401                                BEQ     65$               ;BR IF YES
017246  104004                                ERROR   4                 ;ERROR
017250  104405                        65$:    SCOP1                     ;SW09=1?
017252  000241                                CLC                       ;CLEAR CARRY
017254  106100                                ROLB    R0                ;SHIFT BIT IN R0
017256  001353                                BNE     64$               ;IF R0=0 THEN DONE
017260  012737  017274  001444                MOV     #67$,LOCK         ;NEW SCOP1
017266  012700  000001                        MOV     #1,R0             ;START WITH BIT 0
017272  005100                        69$:    COM     R0                ;CHANGE TO FLOATING ZERO
```

```
017274                          67$:
017274  010061  000004                  MOV     R0,4(R1)        ;PUT PATTERN INTO PORT4
017300  042761  000030  000004          BIC     #30,4(R1)       ;CLEAR UNWANTED BITS
017306  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
017310  121100                          121100!0                ;MOV DATA TO IBUS* REGISTER 0
017312  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
017314  121005                          121005!<0*20>           ;READ FROM IBUS* REGISTER 0
017316  010005                          MOV     R0,R5           ;PUT EXPECTED IN R5
017320  042705  000030                  BIC     #30,R5          ;CLEAR UNWANTED BITS
017324  116104  000005                  MOVB    5(R1),R4        ;PUT "FOUND" INTO R4
017330  120504                          CMPB    R5,R4           ;DATA CORRECT?
017332  001401                          BEQ     68$             ;BR IF YES
017334  104004                          ERROR   4               ;ERROR
017336  104405                  68$:    SCOP1                   ;SW09=1?
017340  005100                          COM     R0              ;CHANGE TO FLOATING 1
017342  000241                          CLC                     ;CLEAR CARRY
017344  106100                          ROLB    R0              ;SHIFT BIT IN R0
017346  001351                          BNE     69$             ;IF R0=0 THEN DONE


                                        ;*************************** TEST 33 ***************************
                                        ;*MICRO PROCESSOR IBUS* REGISTER WRITE/READ TEST
                                        ;*FLOAT A 1 THROUGH IBUS* REGISTER 2
                                        ;*FLOAT A 0 THROUGH IBUS* REGISTER 2
                                        ;;**************************************************************

                                        ;  TEST 33
                                        ;--------------

                                ;;*************************************************************
017350  000004                  TST33:  SCOPE
017352  012737  000033  001202          MOV     #33,$TSTNM              ; LOAD THE NO. OF THIS TEST
017360  012737  017550  001442          MOV     #TST34,NEXT             ; POINT TO THE START OF NEXT TEST.
017366  012737  017406  001444          MOV     #64$,LOCK               ; ADDRESS FOR LOCK ON DATA.
                                                                ;R1 CONTAINS BASE KMC11 ADDRESS
017374  104410                          MSTCLR                  ;MASTER CLEAR KMC11
017376  012702  000002                  MOV     #2,R2           ;SAVE REGISTER ADDRESS FOR TYPEOUT
017402  012700  000001                  MOV     #1,R0           ;START WITH BIT 0
017406                          64$:
017406  010061  000004                  MOV     R0,4(R1)        ;PUT PATTERN INTO PORT4
017412  042761  000070  000004          BIC     #70,4(R1)       ;CLEAR UNWANTED BITS
017420  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
017422  121102                          121100!2                ;MOV DATA TO IBUS* REGISTER 2
017424  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
017426  121045                          121005!<2*20>           ;READ FROM IBUS* REGISTER 2
017430  010005                          MOV     R0,R5           ;PUT EXPECTED IN R5
017432  042705  000070                  BIC     #70,R5          ;CLEAR UNWANTED BITS
017436  116104  000005                  MOVB    5(R1),R4        ;PUT "FOUND" INTO R4
017442  120504                          CMPB    R5,R4           ;DATA CORRECT?
017444  001401                          BEQ     65$             ;BR IF YES
017446  104004                          ERROR   4               ;ERROR
017450  104405                  65$:    SCOP1                   ;SW09=1?
017452  000241                          CLC                     ;CLEAR CARRY
017454  106100                          ROLB    R0              ;SHIFT BIT IN R0
017456  001353                          BNE     64$             ;IF R0=0 THEN DONE
017460  012737  017474  001444          MOV     #67$,LOCK       ;NEW SCOP1
017466  012700  000001                  MOV     #1,R0           ;START WITH BIT 0
```

```
 017472  005100                         69$:    COM     R0                      ;CHANGE TO FLOATING ZERO
 017474                                 67$:
 017474  010061  000004                         MOV     R0,4(R1)                ;PUT PATTERN INTO PORT4
 017500  042761  000070  000004                 BIC     #70,4(R1)               ;CLEAR UNWANTED BITS
 017506  104412                                 ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 017510  121102                                 121100!2                        ;MOV DATA TO IBUS* REGISTER 2
 017512  104412                                 ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 017514  121045                                 121005!<2*20>                   ;READ FROM IBUS* REGISTER 2
 017516  010005                                 MOV     R0,R5                   ;PUT EXPECTED IN R5
 017520  042705  000070                         BIC     #70,R5                  ;CLEAR UNWANTED BITS
 017524  116104  000005                         MOVB    5(R1),R4                ;PUT "FOUND" INTO R4
 017530  120504                                 CMPB    R5,R4                   ;DATA CORRECT?
 017532  001401                                 BEQ     68$                     ;BR IF YES
 017534  104004                                 ERROR   4                       ;ERROR
 017536  104405                         68$:    SCOP1                           ;SW09=1?
 017540  005100                                 COM     R0                      ;CHANGE TO FLOATING 1
 017542  000241                                 CLC                             ;CLEAR CARRY
 017544  106100                                 ROLB    R0                      ;SHIFT BIT IN R0
 017546  001351                                 BNE     69$                     ;IF R0=0 THEN DONE


                                                ;*************************** TEST 34 ***************************
                                                ;*MICRO PROCESSOR IBUS* REGISTER WRITE/READ TEST
                                                ;*FLOAT A 1 THROUGH IBUS* REGISTER 4
                                                ;*FLOAT A 0 THROUGH IBUS* REGISTER 4
                                                ;:**************************************************************

                                                ;  TEST 34
                                                ;--------------

                                        ;:*************************************************************
 017550  000004                         TST34:  SCOPE
 017552  012737  000034  001202                 MOV     #34,$TSTNM              ; LOAD THE NO. OF THIS TEST
 017560  012737  017724  001442                 MOV     #TST35,NEXT             ; POINT TO THE START OF NEXT TEST.
 017566  012737  017606  001444                 MOV     #64$,LOCK               ; ADDRESS FOR LOCK ON DATA.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
 017574  104410                                 MSTCLR                          ;MASTER CLEAR KMC11
 017576  012702  000004                         MOV     #4,R2                   ;SAVE REGISTER ADDRESS FOR TYPEOUT
 017602  012700  000001                         MOV     #1,R0                   ;START WITH BIT 0
 017606                                 64$:
 017606  010061  000004                         MOV     R0,4(R1)                ;PUT PATTERN INTO PORT4
 017612  104412                                 ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 017614  121104                                 121100!4                        ;MOV DATA TO IBUS* REGISTER 4
 017616  104412                                 ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 017620  121105                                 121005!<4*20>                   ;READ FROM IBUS* REGISTER 4
 017622  010005                                 MOV     R0,R5                   ;PUT EXPECTED IN R5
 017624  116104  000005                         MOVB    5(R1),R4                ;PUT "FOUND" INTO R4
 017630  120504                                 CMPB    R5,R4                   ;DATA CORRECT?
 017632  001401                                 BEQ     65$                     ;BR IF YES
 017634  104004                                 ERROR   4                       ;ERROR
 017636  104405                         65$:    SCOP1                           ;SW09=1?
 017640  000241                                 CLC                             ;CLEAR CARRY
 017642  106100                                 ROLB    R0                      ;SHIFT BIT IN R0
 017644  001360                                 BNE     64$                     ;IF R0=0 THEN DONE
 017646  012737  017662  001444                 MOV     #67$,LOCK               ;NEW SCOP1
 017654  012700  000001                         MOV     #1,R0                   ;START WITH BIT 0
 017660  005100                         69$:    COM     R0                      ;CHANGE TO FLOATING ZERO
 017662                           67$:
 017662  010061  000004                   MOV     R0,4(R1)        ;PUT PATTERN INTO PORT4
 017666  104412                           ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 017670  121104                           121100!4                ;MOV DATA TO IBUS* REGISTER 4
 017672  104412                           ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 017674  121105                           121005!<4*20>           ;READ FROM IBUS* REGISTER 4
 017676  010005                           MOV     R0,R5           ;PUT EXPECTED IN R5
 017700  116104  000005                   MOVB    5(R1),R4        ;PUT "FOUND" INTO R4
 017704  120504                           CMPB    R5,R4           ;DATA CORRECT?
 017706  001401                           BEQ     68$             ;BR IF YES
 017710  104004                           ERROR   4               ;ERROR
 017712  104405                   68$:    SCOP1                   ;SW09=1?
 017714  005100                           COM     R0              ;CHANGE TO FLOATING 1
 017716  000241                           CLC                     ;CLEAR CARRY
 017720  106100                           ROLB    R0              ;SHIFT BIT IN R0
 017722  001356                           BNE     69$             ;IF R0=0 THEN DONE



                                          ;************************* TEST 35 *************************
                                          ;*MICRO PROCESSOR IBUS* REGISTER WRITE/READ TEST
                                          ;*FLOAT A 1 THROUGH IBUS* REGISTER 5
                                          ;*FLOAT A 0 THROUGH IBUS* REGISTER 5
                                          ;:**********************************************************


                                          ;    TEST 35
                                          ;______________

                                  ;;*********************************************************
 017724  000004                   TST35:  SCOPE
 017726  012737  000035  001202           MOV     #35,$TSTNM               ; LOAD THE NO. OF THIS TEST
 017734  012737  020100  001442           MOV     #TST36,NEXT              ; POINT TO THE START OF NEXT TEST.
 017742  012737  017762  001444           MOV     #64$,LOCK                ; ADDRESS FOR LOCK ON DATA.
                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
 017750  104410                           MSTCLR                  ;MASTER CLEAR KMC11
 017752  012702  000005                   MOV     #5,R2           ;SAVE REGISTER ADDRESS FOR TYPEOUT
 017756  012700  000001                   MOV     #1,R0           ;START WITH BIT 0
 017762                           64$:
 017762  010061  000004                   MOV     R0,4(R1)        ;PUT PATTERN INTO PORT4
 017766  104412                           ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 017770  121105                           121100!5                ;MOV DATA TO IBUS* REGISTER 5
 017772  104412                           ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 017774  121125                           121005!<5*20>           ;READ FROM IBUS* REGISTER 5
 017776  010005                           MOV     R0,R5           ;PUT EXPECTED IN R5
 020000  116104  000005                   MOVB    5(R1),R4        ;PUT "FOUND" INTO R4
 020004  120504                           CMPB    R5,R4           ;DATA CORRECT?
 020006  001401                           BEQ     65$             ;BR IF YES
 020010  104004                           ERROR   4               ;ERROR
 020012  104405                   65$:    SCOP1                   ;SW09=1?
 020014  000241                           CLC                     ;CLEAR CARRY
 020016  106100                           ROLB    R0              ;SHIFT BIT IN R0
 020020  001360                           BNE     64$             ;IF R0=0 THEN DONE
 020022  012737  020036  001444           MOV     #67$,LOCK       ;NEW SCOP1
 020030  012700  000001                   MOV     #1,R0           ;START WITH BIT 0
 020034  005100                   69$:    COM     R0              ;CHANGE TO FLOATING ZERO
 020036                           67$:
 020036  010061  000004                   MOV     R0,4(R1)        ;PUT PATTERN INTO PORT4
 020042  104412                           ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
```

```
020044  121105                            121100!5                      ;MOV DATA TO IBUS* REGISTER 5
020046  104412                            ROMCLK                        ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020050  121125                            121005!<5*20>                 ;READ FROM IBUS* REGISTER 5
020052  010005                            MOV     R0,R5                 ;PUT EXPECTED IN R5
020054  116104  000005                    MOVB    5(R1),R4              ;PUT "FOUND" INTO R4
020060  120504                            CMPB    R5,R4                 ;DATA CORRECT?
020062  001401                            BEQ     68$                   ;BR IF YES
020064  104004                            ERROR   4                     ;ERROR
020066  104405                    68$:    SCOP1                         ;SW09=1?
020070  005100                            COM     R0                    ;CHANGE TO FLOATING 1
020072  000241                            CLC                           ;CLEAR CARRY
020074  106100                            ROLB    R0                    ;SHIFT BIT IN R0
020076  001356                            BNE     69$                   ;IF R0=0 THEN DONE



                                          ;************************** TEST 36 **************************
                                          ;*MICRO PROCESSOR IBUS* REGISTER WRITE/READ TEST
                                          ;*FLOAT A 1 THROUGH IBUS* REGISTER 10
                                          ;*FLOAT A 0 THROUGH IBUS* REGISTER 10
                                          ;:*************************************************************

                                          ;  TEST 36
                                          ;--------------

                                  ;:**************************************************************
020100  000004                    TST36:  SCOPE
020102  012737  000036  001202            MOV     #36,$TSTNM                    ; LOAD THE NO. OF THIS TEST
020110  012737  020300  001442            MOV     #TST37,NEXT                   ; POINT TO THE START OF NEXT TEST.
020116  012737  020136  001444            MOV     #64$,LOCK                     ; ADDRESS FOR LOCK ON DATA.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
020124  104410                            MSTCLR                        ;MASTER CLEAR KMC11
020126  012702  000010                    MOV     #10,R2                ;SAVE REGISTER ADDRESS FOR TYPEOUT
020132  012700  000001                    MOV     #1,R0                 ;START WITH BIT 0
020136                            64$:
020136  010061  000004                    MOV     R0,4(R1)              ;PUT PATTERN INTO PORT4
020142  042761  000141  000004            BIC     #141,4(R1)            ;CLEAR UNWANTED BITS
020150  104412                            ROMCLK                        ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020152  121110                            121100!10                     ;MOV DATA TO IBUS* REGISTER 10
020154  104412                            ROMCLK                        ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020156  121205                            121005!<10*20>                ;READ FROM IBUS* REGISTER 10
020160  010005                            MOV     R0,R5                 ;PUT EXPECTED IN R5
020162  042705  000141                    BIC     #141,R5               ;CLEAR UNWANTED BITS
020166  116104  000005                    MOVB    5(R1),R4              ;PUT "FOUND" INTO R4
020172  120504                            CMPB    R5,R4                 ;DATA CORRECT?
020174  001401                            BEQ     65$                   ;BR IF YES
020176  104004                            ERROR   4                     ;ERROR
020200  104405                    65$:    SCOP1                         ;SW09=1?
020202  000241                            CLC                           ;CLEAR CARRY
020204  106100                            ROLB    R0                    ;SHIFT BIT IN R0
020206  001353                            BNE     64$                   ;IF R0=0 THEN DONE
020210  012737  020224  001444            MOV     #67$,LOCK             ;NEW SCOP1
020216  012700  000001                    MOV     #1,R0                 ;START WITH BIT 0
020222  005100                    69$:    COM     R0                    ;CHANGE TO FLOATING ZERO
020224                            67$:
020224  010061  000004                    MOV     R0,4(R1)              ;PUT PATTERN INTO PORT4
020230  042761  000141  000004            BIC     #141,4(R1)            ;CLEAR UNWANTED BITS
020236  104412                            ROMCLK                        ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
```

```
020240  121110                                    121100!10               ;MOV DATA TO IBUS* REGISTER 10
020242  104412                                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020244  121205                                    121005!<10*20>          ;READ FROM IBUS* REGISTER 10
020246  010005                                    MOV     R0,R5           ;PUT EXPECTED IN R5
020250  042705  000141                            BIC     #141,R5         ;CLEAR UNWANTED BITS
020254  116104  000005                            MOVB    5(R1),R4        ;PUT "FOUND" INTO R4
020260  120504                                    CMPB    R5,R4           ;DATA CORRECT?
020262  001401                                    BEQ     68$             ;BR IF YES
020264  104004                                    ERROR   4               ;ERROR
020266  104405                            68$:    SCOP1                   ;SW09=1?
020270  005100                                    COM     R0              ;CHANGE TO FLOATING 1
020272  000241                                    CLC                     ;CLEAR CARRY
020274  106100                                    ROLB    R0              ;SHIFT BIT IN R0
020276  001351                                    BNE     69$             ;IF R0=0 THEN DONE


                                                  ;************************ TEST 37 **************************
                                                  ;*MICRO PROCESSOR IBUS* REGISTER WRITE/READ TEST
                                                  ;*FLOAT A 1 THROUGH IBUS* REGISTER 11
                                                  ;*FLOAT A 0 THROUGH IBUS* REGISTER 11
                                                  ;;*********************************************************

                                                  ;  TEST 37
                                                  ;-------------
                                          ;;*********************************************************
020300  000004                            TST37:  SCOPE
020302  012737  000037  001202                    MOV     #37,$TSTNM              ; LOAD THE NO. OF THIS TEST
020310  012737  020510  001442                    MOV     #TST40,NEXT             ; POINT TO THE START OF NEXT TEST.
020316  012737  020336  001444                    MOV     #64$,LOCK               ; ADDRESS FOR LOCK ON DATA.
                                                                          ;R1 CONTAINS BASE KMC11 ADDRESS
020324  104410                                    MSTCLR                  ;MASTER CLEAR KMC11
020326  012702  000011                            MOV     #11,R2          ;SAVE REGISTER ADDRESS FOR TYPEOUT
020332  012700  000001                            MOV     #1,R0           ;START WITH BIT 0
020336                                    64$:
020336  010061  000004                            MOV     R0,4(R1)        ;PUT PATTERN INTO PORT4
020342  042761  000262  000004                    BIC     #262,4(R1)      ;CLEAR UNWANTED BITS
020350  104412                                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020352  121111                                    121100!11               ;MOV DATA TO IBUS* REGISTER 11
020354  104412                                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020356  121225                                    121005!<11*20>          ;READ FROM IBUS* REGISTER 11
020360  010005                                    MOV     R0,R5           ;PUT EXPECTED IN R5
020362  042705  000262                            BIC     #262,R5         ;CLEAR UNWANTED BITS
020366  052705  000020                            BIS     #20,R5          ;ADD THESE BITS
020372  116104  000005                            MOVB    5(R1),R4        ;PUT "FOUND" INTO R4
020376  120504                                    CMPB    R5,R4           ;DATA CORRECT?
020400  001401                                    BEQ     65$             ;BR IF YES
020402  104004                                    ERROR   4               ;ERROR
020404  104405                            65$:    SCOP1                   ;SW09=1?
020406  000241                                    CLC                     ;CLEAR CARRY
020410  106100                                    ROLB    R0              ;SHIFT BIT IN R0
020412  001351                                    BNE     64$             ;IF R0=0 THEN DONE
020414  012737  020430  001444                    MOV     #67$,LOCK       ;NEW SCOP1
020422  012700  000001                            MOV     #1,R0           ;START WITH BIT 0
020426  005100                            69$:    COM     R0              ;CHANGE TO FLOATING ZERO
020430                                    67$:
020430  010061  000004                            MOV     R0,4(R1)        ;PUT PATTERN INTO PORT4
```

```
020434  042761  000262  000004          BIC     #262,4(R1)              ;CLEAR UNWANTED BITS
020442  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020444  121111                          121100!11                       ;MOV DATA TO IBUS* REGISTER 11
020446  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020450  121225                          121005!<11*20>                  ;READ FROM IBUS* REGISTER 11
020452  010005                          MOV     R0,R5                   ;PUT EXPECTED IN R5
020454  042705  000262                  BIC     #262,R5                 ;CLEAR UNWANTED BITS
020460  052705  000020                  BIS     #20,R5                  ;ADD THESE BITS
020464  116104  000005                  MOVB    5(R1),R4                ;PUT "FOUND" INTO R4
020470  120504                          CMPB    R5,R4                   ;DATA CORRECT?
020472  001401                          BEQ     68$                     ;BR IF YES
020474  104004                          ERROR   4                       ;ERROR
020476  104405                  68$:    SCOP1                           ;SW09=1?
020500  005100                          COM     R0                      ;CHANGE TO FLOATING 1
020502  000241                          CLC                             ;CLEAR CARRY
020504  106100                          ROLB    R0                      ;SHIFT BIT IN R0
020506  001347                          BNE     69$                     ;IF R0=0 THEN DONE


                                        ;*************************** TEST 40 ***************************
                                        ;*MICRO PROCESSOR IBUS REGISTER WRITE/READ TEST
                                        ;*FLOAT A 1 THROUGH IBUS REGISTER 0
                                        ;*FLOAT A 0 THROUGH IBUS REGISTER 0
                                        ;:**************************************************************

                                        ;  TEST 40
                                        ;--------------
                                ;;*******************************************************************
020510  000004                  TST40:  SCOPE
020512  012737  000040  001202          MOV     #40,$TSTNM                      ; LOAD THE NO. OF THIS TEST
020520  012737  020664  001442          MOV     #TST41,NEXT                     ; POINT TO THE START OF NEXT TEST.
020526  012737  020546  001444          MOV     #64$,LOCK                       ; ADDRESS FOR LOCK ON DATA.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
020534  104410                          MSTCLR                          ;MASTER CLEAR KMC11
020536  012702  000000                  MOV     #0,R2                   ;SAVE REGISTER ADDRESS FOR TYPEOUT
020542  012700  000001                  MOV     #1,R0                   ;START WITH BIT 0
020546                          64$:
020546  010061  000004                  MOV     R0,4(R1)                ;PUT PATTERN INTO PORT4
020552  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020554  122100                          122100!0                        ;MOV DATA TO IBUS REGISTER 0
020556  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020560  021005                          21005!<0*20>                    ;READ FROM IBUS REGISTER 0
020562  010005                          MOV     R0,R5                   ;PUT EXPECTED IN R5
020564  116104  000005                  MOVB    5(R1),R4                ;PUT "FOUND" INTO R4
020570  120504                          CMPB    R5,R4                   ;DATA CORRECT?
020572  001401                          BEQ     65$                     ;BR IF YES
020574  104005                          ERROR   5                       ;ERROR
020576  104405                  65$:    SCOP1                           ;SW09=1?
020600  000241                          CLC                             ;CLEAR CARRY
020602  106100                          ROLB    R0                      ;SHIFT BIT IN R0
020604  001360                          BNE     64$                     ;IF R0=0 THEN DONE
020606  012737  020622  001444          MOV     #67$,LOCK               ;NEW SCOP1
020614  012700  000001                  MOV     #1,R0                   ;START WITH BIT 0
020620  005100                  69$:    COM     R0                      ;CHANGE TO FLOATING ZERO
020622                          67$:
020622  010061  000004                  MOV     R0,4(R1)                ;PUT PATTERN INTO PORT4
```

```
020626  104412                            ROMCLK                        ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020630  122100                            122100!0                      ;MOV DATA TO IBUS REGISTER 0
020632  104412                            ROMCLK                        ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020634  021005                            21005!<0*20>                  ;READ FROM IBUS REGISTER 0
020636  010005                            MOV     R0,R5                 ;PUT EXPECTED IN R5
020640  116104  000005                    MOVB    5(R1),R4              ;PUT "FOUND" INTO R4
020644  120504                            CMPB    R5,R4                 ;DATA CORRECT?
020646  001401                            BEQ     68$                   ;BR IF YES
020650  104005                            ERROR   5                     ;ERROR
020652  104405                    68$:    SCOP1                         ;SW09=1?
020654  005100                            COM     R0                    ;CHANGE TO FLOATING 1
020656  000241                            CLC                           ;CLEAR CARRY
020660  106100                            ROLB    R0                    ;SHIFT BIT IN R0
020662  001356                            BNE     69$                   ;IF R0=0 THEN DONE


                                          ;*************************** TEST 41 ***************************
                                          ;*MICRO PROCESSOR IBUS REGISTER WRITE/READ TEST
                                          ;*FLOAT A 1 THROUGH IBUS REGISTER 1
                                          ;*FLOAT A 0 THROUGH IBUS REGISTER 1
                                          ;;***************************************************************

                                          ;  TEST 41
                                          ;--------------
                                  ;;**************************************************************
020664  000004                    TST41:  SCOPE
020666  012737  000041  001202            MOV     #41,$TSTNM                   ; LOAD THE NO. OF THIS TEST
020674  012737  021040  001442            MOV     #TST42,NEXT                  ; POINT TO THE START OF NEXT TEST.
020702  012737  020722  001444            MOV     #64$,LOCK                    ; ADDRESS FOR LOCK ON DATA.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
020710  104410                            MSTCLR                        ;MASTER CLEAR KMC11
020712  012702  000001                    MOV     #1,R2                 ;SAVE REGISTER ADDRESS FOR TYPEOUT
020716  012700  000001                    MOV     #1,R0                 ;START WITH BIT 0
020722                            64$:
020722  010061  000004                    MOV     R0,4(R1)              ;PUT PATTERN INTO PORT4
020726  104412                            ROMCLK                        ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020730  122101                            122100!1                      ;MOV DATA TO IBUS REGISTER 1
020732  104412                            ROMCLK                        ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
020734  021025                            21005!<1*20>                  ;READ FROM IBUS REGISTER 1
020736  010005                            MOV     R0,R5                 ;PUT EXPECTED IN R5
020740  116104  000005                    MOVB    5(R1),R4              ;PUT "FOUND" INTO R4
020744  120504                            CMPB    R5,R4                 ;DATA CORRECT?
020746  001401                            BEQ     65$                   ;BR IF YES
020750  104005                            ERROR   5                     ;ERROR
020752  104405                    65$:    SCOP1                         ;SW09=1?
020754  000241                            CLC                           ;CLEAR CARRY
020756  106100                            ROLB    R0                    ;SHIFT BIT IN R0
020760  001360                            BNE     64$                   ;IF R0=0 THEN DONE
020762  012737  020776  001444            MOV     #67$,LOCK             ;NEW SCOP1
020770  012700  000001                    MOV     #1,R0                 ;START WITH BIT 0
020774  005100                    69$:    COM     R0                    ;CHANGE TO FLOATING ZERO
020776                            67$:
020776  010061  000004                    MOV     R0,4(R1)              ;PUT PATTERN INTO PORT4
021002  104412                            ROMCLK                        ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021004  122101                            122100!1                      ;MOV DATA TO IBUS REGISTER 1
021006  104412                            ROMCLK                        ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
```

```
021010  021025                          21005!<1*20>                    ;READ FROM IBUS REGISTER 1
021012  010005                          MOV     R0,R5                   ;PUT EXPECTED IN R5
021014  116104  000005                  MOVB    5(R1),R4                ;PUT "FOUND" INTO R4
021020  120504                          CMPB    R5,R4                   ;DATA CORRECT?
021022  001401                          BEQ     68$                     ;BR IF YES
021024  104005                          ERROR   5                       ;ERROR
021026  104405                  68$:    SCOP1                           ;SW09=1?
021030  005100                          COM     R0                      ;CHANGE TO FLOATING 1
021032  000241                          CLC                             ;CLEAR CARRY
021034  106100                          ROLB    R0                      ;SHIFT BIT IN R0
021036  001356                          BNE     69$                     ;IF R0=0 THEN DONE


                                        ;*************************** TEST 42 ***************************
                                        ;*MICRO PROCESSOR IBUS REGISTER WRITE/READ TEST
                                        ;*FLOAT A 1 THROUGH IBUS REGISTER 2
                                        ;*FLOAT A 0 THROUGH IBUS REGISTER 2
                                        ;;*************************************************************

                                        ;   TEST 42
                                        ;-------------

                                ;;*************************************************************
021040  000004                  TST42:  SCOPE
021042  012737  000042  001202          MOV     #42,$TSTNM                      ; LOAD THE NO. OF THIS TEST
021050  012737  021214  001442          MOV     #TST43,NEXT                     ; POINT TO THE START OF NEXT TEST.
021056  012737  021076  001444          MOV     #64$,LOCK                       ; ADDRESS FOR LOCK ON DATA.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
021064  104410                          MSTCLR                          ;MASTER CLEAR KMC11
021066  012702  000002                  MOV     #2,R2                   ;SAVE REGISTER ADDRESS FOR TYPEOUT
021072  012700  000001                  MOV     #1,R0                   ;START WITH BIT 0
021076                          64$:
021076  010061  000004                  MOV     R0,4(R1)                ;PUT PATTERN INTO PORT4
021102  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021104  122102                          122100!2                        ;MOV DATA TO IBUS REGISTER 2
021106  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021110  021045                          21005!<2*20>                    ;READ FROM IBUS REGISTER 2
021112  010005                          MOV     R0,R5                   ;PUT EXPECTED IN R5
021114  116104  000005                  MOVB    5(R1),R4                ;PUT "FOUND" INTO R4
021120  120504                          CMPB    R5,R4                   ;DATA CORRECT?
021122  001401                          BEQ     65$                     ;BR IF YES
021124  104005                          ERROR   5                       ;ERROR
021126  104405                  65$:    SCOP1                           ;SW09=1?
021130  000241                          CLC                             ;CLEAR CARRY
021132  106100                          ROLB    R0                      ;SHIFT BIT IN R0
021134  001360                          BNE     64$                     ;IF R0=0 THEN DONE
021136  012737  021152  001444          MOV     #67$,LOCK               ;NEW SCOP1
021144  012700  000001                  MOV     #1,R0                   ;START WITH BIT 0
021150  005100                  69$:    COM     R0                      ;CHANGE TO FLOATING ZERO
021152                          67$:
021152  010061  000004                  MOV     R0,4(R1)                ;PUT PATTERN INTO PORT4
021156  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021160  122102                          122100!2                        ;MOV DATA TO IBUS REGISTER 2
021162  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021164  021045                          21005!<2*20>                    ;READ FROM IBUS REGISTER 2
021166  010005                          MOV     R0,R5                   ;PUT EXPECTED IN R5
021170  116104  000005                  MOVB    5(R1),R4                ;PUT "FOUND" INTO R4
```

```
021174  120504                          CMPB    R5,R4           ;DATA CORRECT?
021176  001401                          BEQ     68$             ;BR IF YES
021200  104005                          ERROR   5               ;ERROR
021202  104405                  68$:    SCOP1                   ;SW09=1?
021204  005100                          COM     R0              ;CHANGE TO FLOATING 1
021206  000241                          CLC                     ;CLEAR CARRY
021210  106100                          ROLB    R0              ;SHIFT BIT IN R0
021212  001356                          BNE     69$             ;IF R0=0 THEN DONE


                                        ;*********************** TEST 43 ***********************
                                        ;*MICRO PROCESSOR IBUS REGISTER WRITE/READ TEST
                                        ;*FLOAT A 1 THROUGH IBUS REGISTER 3
                                        ;*FLOAT A 0 THROUGH IBUS REGISTER 3
                                        ;:*******************************************************

                                        ;  TEST 43
                                        ;_____________

                                ;;*******************************************************
021214  000004                  TST43:  SCOPE
021216  012737  000043  001202          MOV     #43,$TSTNM              ; LOAD THE NO. OF THIS TEST
021224  012737  021370  001442          MOV     #TST44,NEXT             ; POINT TO THE START OF NEXT TEST.
021232  012737  021252  001444          MOV     #64$,LOCK               ; ADDRESS FOR LOCK ON DATA.
                                                                ;R1 CONTAINS BASE KMC11 ADDRESS
021240  104410                          MSTCLR                  ;MASTER CLEAR KMC11
021242  012702  000003                  MOV     #3,R2           ;SAVE REGISTER ADDRESS FOR TYPEOUT
021246  012700  000001                  MOV     #1,R0           ;START WITH BIT 0
021252                          64$:
021252  010061  000004                  MOV     R0,4(R1)        ;PUT PATTERN INTO PORT4
021256  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021260  122103                          122100!3                ;MOV DATA TO IBUS REGISTER 3
021262  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021264  021065                          21005!<3*20>            ;READ FROM IBUS REGISTER 3
021266  010005                          MOV     R0,R5           ;PUT EXPECTED IN R5
021270  116104  000005                  MOVB    5(R1),R4        ;PUT "FOUND" INTO R4
021274  120504                          CMPB    R5,R4           ;DATA CORRECT?
021276  001401                          BEQ     65$             ;BR IF YES
021300  104005                          ERROR   5               ;ERROR
021302  104405                  65$:    SCOP1                   ;SW09=1?
021304  000241                          CLC                     ;CLEAR CARRY
021306  106100                          ROLB    R0              ;SHIFT BIT IN R0
021310  001360                          BNE     64$             ;IF R0=0 THEN DONE
021312  012737  021326  001444          MOV     #67$,LOCK       ;NEW SCOP1
021320  012700  000001                  MOV     #1,R0           ;START WITH BIT 0
021324  005100                  69$:    COM     R0              ;CHANGE TO FLOATING ZERO
021326                          67$:
021326  010061  000004                  MOV     R0,4(R1)        ;PUT PATTERN INTO PORT4
021332  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021334  122103                          122100!3                ;MOV DATA TO IBUS REGISTER 3
021336  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021340  021065                          21005!<3*20>            ;READ FROM IBUS REGISTER 3
021342  010005                          MOV     R0,R5           ;PUT EXPECTED IN R5
021344  116104  000005                  MOVB    5(R1),R4        ;PUT "FOUND" INTO R4
021350  120504                          CMPB    R5,R4           ;DATA CORRECT?
021352  001401                          BEQ     68$             ;BR IF YES
021354  104005                          ERROR   5               ;ERROR
```

```
021356  104405                          68$:    SCOP1                           ;SW09=1?
021360  005100                                  COM     R0                      ;CHANGE TO FLOATING 1
021362  000241                                  CLC                             ;CLEAR CARRY
021364  106100                                  ROLB    R0                      ;SHIFT BIT IN R0
021366  001356                                  BNE     69$                     ;IF R0=0 THEN DONE


                                                ;*************************** TEST 44 ***************************
                                                ;*MICRO PROCESSOR IBUS REGISTER WRITE/READ TEST
                                                ;*FLOAT A 1 THROUGH IBUS REGISTER 4
                                                ;*FLOAT A 0 THROUGH IBUS REGISTER 4
                                                ;:***************************************************************

                                                ;  TEST 44
                                                ;--------------
                                        ;:*************************************************************
021370  000004                          TST44:  SCOPE
021372  012737  000044  001202                  MOV     #44,$TSTNM                      ; LOAD THE NO. OF THIS TEST
021400  012737  021544  001442                  MOV     #TST45,NEXT                     ; POINT TO THE START OF NEXT TEST.
021406  012737  021426  001444                  MOV     #64$,LOCK                       ; ADDRESS FOR LOCK ON DATA.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
021414  104410                                  MSTCLR                  ;MASTER CLEAR KMC11
021416  012702  000004                          MOV     #4,R2           ;SAVE REGISTER ADDRESS FOR TYPEOUT
021422  012700  000001                          MOV     #1,R0           ;START WITH BIT 0
021426                                  64$:
021426  010061  000004                          MOV     R0,4(R1)        ;PUT PATTERN INTO PORT4
021432  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021434  122104                                  122100!4                ;MOV DATA TO IBUS REGISTER 4
021436  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021440  021105                                  21005!<4*20>            ;READ FROM IBUS REGISTER 4
021442  010005                                  MOV     R0,R5           ;PUT EXPECTED IN R5
021444  116104  000005                          MOVB    5(R1),R4        ;PUT "FOUND" INTO R4
021450  120504                                  CMPB    R5,R4           ;DATA CORRECT?
021452  001401                                  BEQ     65$             ;BR IF YES
021454  104005                                  ERROR   5               ;ERROR
021456  104405                          65$:    SCOP1                   ;SW09=1?
021460  000241                                  CLC                     ;CLEAR CARRY
021462  106100                                  ROLB    R0              ;SHIFT BIT IN R0
021464  001360                                  BNE     64$             ;IF R0=0 THEN DONE
021466  012737  021502  001444                  MOV     #67$,LOCK       ;NEW SCOP1
021474  012700  000001                          MOV     #1,R0           ;START WITH BIT 0
021500  005100                          69$:    COM     R0              ;CHANGE TO FLOATING ZERO
021502                                  67$:
021502  010061  000004                          MOV     R0,4(R1)        ;PUT PATTERN INTO PORT4
021506  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021510  122104                                  122100!4                ;MOV DATA TO IBUS REGISTER 4
021512  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021514  021105                                  21005!<4*20>            ;READ FROM IBUS REGISTER 4
021516  010005                                  MOV     R0,R5           ;PUT EXPECTED IN R5
021520  116104  000005                          MOVB    5(R1),R4        ;PUT "FOUND" INTO R4
021524  120504                                  CMPB    R5,R4           ;DATA CORRECT?
021526  001401                                  BEQ     68$             ;BR IF YES
021530  104005                                  ERROR   5               ;ERROR
021532  104405                          68$:    SCOP1                   ;SW09=1?
021534  005100                                  COM     R0              ;CHANGE TO FLOATING 1
021536  000241                                  CLC                     ;CLEAR CARRY
```

```
021540  106100                          ROLB    R0                      ;SHIFT BIT IN R0
021542  001356                          BNE     69$                     ;IF R0=0 THEN DONE


                                        ;************************* TEST 45 ***************************
                                        ;*MICRO PROCESSOR IBUS REGISTER WRITE/READ TEST
                                        ;*FLOAT A 1 THROUGH IBUS REGISTER 5
                                        ;*FLOAT A 0 THROUGH IBUS REGISTER 5
                                        ;:*************************************************************

                                        ;  TEST 45
                                        ;--------------
                                ;;**************************************************************
021544  000004                  TST45:  SCOPE
021546  012737  000045  001202          MOV     #45,$TSTNM              ; LOAD THE NO. OF THIS TEST
021554  012737  021720  001442          MOV     #TST46,NEXT             ; POINT TO THE START OF NEXT TEST.
021562  012737  021602  001444          MOV     #64$,LOCK               ; ADDRESS FOR LOCK ON DATA.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
021570  104410                          MSTCLR                          ;MASTER CLEAR KMC11
021572  012702  000005                  MOV     #5,R2                   ;SAVE REGISTER ADDRESS FOR TYPEOUT
021576  012700  000001                  MOV     #1,R0                   ;START WITH BIT 0
021602                          64$:
021602  010061  000004                  MOV     R0,4(R1)                ;PUT PATTERN INTO PORT4
021606  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021610  122105                          122100!5                        ;MOV DATA TO IBUS REGISTER 5
021612  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021614  021125                          21005!<5*20>                    ;READ FROM IBUS REGISTER 5
021616  010005                          MOV     R0,R5                   ;PUT EXPECTED IN R5
021620  116104  000005                  MOVB    5(R1),R4                ;PUT "FOUND" INTO R4
021624  120504                          CMPB    R5,R4                   ;DATA CORRECT?
021626  001401                          BEQ     65$                     ;BR IF YES
021630  104005                          ERROR   5                       ;ERROR
021632  104405                  65$:    SCOP1                           ;SW09=1?
021634  000241                          CLC                             ;CLEAR CARRY
021636  106100                          ROLB    R0                      ;SHIFT BIT IN R0
021640  001360                          BNE     64$                     ;IF R0=0 THEN DONE
021642  012737  021656  001444          MOV     #67$,LOCK               ;NEW SCOP1
021650  012700  000001                  MOV     #1,R0                   ;START WITH BIT 0
021654  005100                  69$:    COM     R0                      ;CHANGE TO FLOATING ZERO
021656                          67$:
021656  010061  000004                  MOV     R0,4(R1)                ;PUT PATTERN INTO PORT4
021662  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021664  122105                          122100!5                        ;MOV DATA TO IBUS REGISTER 5
021666  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021670  021125                          21005!<5*20>                    ;READ FROM IBUS REGISTER 5
021672  010005                          MOV     R0,R5                   ;PUT EXPECTED IN R5
021674  116104  000005                  MOVB    5(R1),R4                ;PUT "FOUND" INTO R4
021700  120504                          CMPB    R5,R4                   ;DATA CORRECT?
021702  001401                          BEQ     68$                     ;BR IF YES
021704  104005                          ERROR   5                       ;ERROR
021706  104405                  68$:    SCOP1                           ;SW09=1?
021710  005100                          COM     R0                      ;CHANGE TO FLOATING 1
021712  000241                          CLC                             ;CLEAR CARRY
021714  106100                          ROLB    R0                      ;SHIFT BIT IN R0
021716  001356                          BNE     69$                     ;IF R0=0 THEN DONE
```

```

                                                 ;*************************** TEST 46 ***************************
                                                 ;*MICRO PROCESSOR IBUS REGISTER WRITE/READ TEST
                                                 ;*FLOAT A 1 THROUGH IBUS REGISTER 6
                                                 ;*FLOAT A 0 THROUGH IBUS REGISTER 6
                                                 ;;*************************************************************

                                                 ;  TEST 46
                                                 ;--------------

                                         ;;*************************************************************
021720  000004                           TST46:  SCOPE
021722  012737  000046  001202                   MOV     #46,$TSTNM              ; LOAD THE NO. OF THIS TEST
021730  012737  022074  001442                   MOV     #TST47,NEXT             ; POINT TO THE START OF NEXT TEST.
021736  012737  021756  001444                   MOV     #64$,LOCK               ; ADDRESS FOR LOCK ON DATA.
                                                                         ;R1 CONTAINS BASE KMC11 ADDRESS
021744  104410                                   MSTCLR                  ;MASTER CLEAR KMC11
021746  012702  000006                           MOV     #6,R2           ;SAVE REGISTER ADDRESS FOR TYPEOUT
021752  012700  000001                           MOV     #1,R0           ;START WITH BIT 0
021756                                   64$:
021756  010061  000004                           MOV     R0,4(R1)        ;PUT PATTERN INTO PORT4
021762  104412                                   ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021764  122106                                   122100!6                ;MOV DATA TO IBUS REGISTER 6
021766  104412                                   ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021770  021145                                   21005!<6*20>            ;READ FROM IBUS REGISTER 6
021772  010005                                   MOV     R0,R5           ;PUT EXPECTED IN R5
021774  116104  000005                           MOVB    5(R1),R4        ;PUT "FOUND" INTO R4
022000  120504                                   CMPB    R5,R4           ;DATA CORRECT?
022002  001401                                   BEQ     65$             ;BR IF YES
022004  104005                                   ERROR   5               ;ERROR
022006  104405                           65$:    SCOP1                   ;SW09=1?
022010  000241                                   CLC                     ;CLEAR CARRY
022012  106100                                   ROLB    R0              ;SHIFT BIT IN R0
022014  001360                                   BNE     64$             ;IF R0=0 THEN DONE
022016  012737  022032  001444                   MOV     #67$,LOCK       ;NEW SCOP1
022024  012700  000001                           MOV     #1,R0           ;START WITH BIT 0
022030  005100                           69$:    COM     R0              ;CHANGE TO FLOATING ZERO
022032                                   67$:
022032  010061  000004                           MOV     R0,4(R1)        ;PUT PATTERN INTO PORT4
022036  104412                                   ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
022040  122106                                   122100!6                ;MOV DATA TO IBUS REGISTER 6
022042  104412                                   ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
022044  021145                                   21005!<6*20>            ;READ FROM IBUS REGISTER 6
022046  010005                                   MOV     R0,R5           ;PUT EXPECTED IN R5
022050  116104  000005                           MOVB    5(R1),R4        ;PUT "FOUND" INTO R4
022054  120504                                   CMPB    R5,R4           ;DATA CORRECT?
022056  001401                                   BEQ     68$             ;BR IF YES
022060  104005                                   ERROR   5               ;ERROR
022062  104405                           68$:    SCOP1                   ;SW09=1?
022064  005100                                   COM     R0              ;CHANGE TO FLOATING 1
022066  000241                                   CLC                     ;CLEAR CARRY
022070  106100                                   ROLB    R0              ;SHIFT BIT IN R0
022072  001356                                   BNE     69$             ;IF R0=0 THEN DONE



                                                 ;*************************** TEST 47 ***************************
                                                 ;*MICRO PROCESSOR IBUS REGISTER WRITE/READ TEST
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                                                       ;*FLOAT A 1 THROUGH IBUS REGISTER 7
                                                       ;*FLOAT A 0 THROUGH IBUS REGISTER 7
                                                       ;;*******************************************************************

                                                       ;   TEST 47
                                                       ;_______________

                                                       ;;***********************************************************************
 022074  000004                           TST47:       SCOPE
 022076  012737  000047  001202                        MOV      #47,$TSTNM                  ; LOAD THE NO. OF THIS TEST
 022104  012737  022250  001442                        MOV      #TST50,NEXT                 ; POINT TO THE START OF NEXT TEST.
 022112  012737  022132  001444                        MOV      #64$,LOCK                   ; ADDRESS FOR LOCK ON DATA.
                                                                                          ;R1 CONTAINS BASE KMC11 ADDRESS
 022120  104410                                        MSTCLR                             ;MASTER CLEAR KMC11
 022122  012702  000007                                MOV      #7,R2                     ;SAVE REGISTER ADDRESS FOR TYPEOUT
 022126  012700  000001                                MOV      #1,R0                     ;START WITH BIT 0
 022132                                   64$:
 022132  010061  000004                                MOV      R0,4(R1)                  ;PUT PATTERN INTO PORT4
 022136  104412                                        ROMCLK                             ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 022140  122107                                        122100!7                           ;MOV DATA TO IBUS REGISTER 7
 022142  104412                                        ROMCLK                             ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 022144  021165                                        21005!<7*20>                       ;READ FROM IBUS REGISTER 7
 022146  010005                                        MOV      R0,R5                     ;PUT EXPECTED IN R5
 022150  116104  000005                                MOVB     5(R1),R4                  ;PUT "FOUND" INTO R4
 022154  120504                                        CMPB     R5,R4                     ;DATA CORRECT?
 022156  001401                                        BEQ      65$                       ;BR IF YES
 022160  104005                                        ERROR    5                         ;ERROR
 022162  104405                           65$:         SCOP1                              ;SW09=1?
 022164  000241                                        CLC                                ;CLEAR CARRY
 022166  106100                                        ROLB     R0                        ;SHIFT BIT IN R0
 022170  001360                                        BNE      64$                       ;IF R0=0 THEN DONE
 022172  012737  022206  001444                        MOV      #67$,LOCK                 ;NEW SCOP1
 022200  012700  000001                                MOV      #1,R0                     ;START WITH BIT 0
 022204  005100                           69$:         COM      R0                        ;CHANGE TO FLOATING ZERO
 022206                                   67$:
 022206  010061  000004                                MOV      R0,4(R1)                  ;PUT PATTERN INTO PORT4
 022212  104412                                        ROMCLK                             ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 022214  122107                                        122100!7                           ;MOV DATA TO IBUS REGISTER 7
 022216  104412                                        ROMCLK                             ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 022220  021165                                        21005!<7*20>                       ;READ FROM IBUS REGISTER 7
 022222  010005                                        MOV      R0,R5                     ;PUT EXPECTED IN R5
 022224  116104  000005                                MOVB     5(R1),R4                  ;PUT "FOUND" INTO R4
 022230  120504                                        CMPB     R5,R4                     ;DATA CORRECT?
 022232  001401                                        BEQ      68$                       ;BR IF YES
 022234  104005                                        ERROR    5                         ;ERROR
 022236  104405                           68$:         SCOP1                              ;SW09=1?
 022240  005100                                        COM      R0                        ;CHANGE TO FLOATING 1
 022242  000241                                        CLC                                ;CLEAR CARRY
 022244  106100                                        ROLB     R0                        ;SHIFT BIT IN R0
 022246  001356                                        BNE      69$                       ;IF R0=0 THEN DONE



                                                       ;************************** TEST 50 ***************************
                                                       ;*MICRO PROCESSOR IBUS DUAL ADDRESS TEST
                                                       ;*WRITE ALL IBUS REGISTERS WITH INCREMENTING PATTERN
                                                       ;*READ ALL IBUS REGISTERS TO VERIFY CORRECT ADDRESSING
                                                       ;;*******************************************************************
```

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                                               ;  TEST 50
                                               ;-------------
                                       ;;***********************************************************
022250  000004                         TST50:  SCOPE
022252  012737  000050  001202                 MOV     #50,$TSTNM              ; LOAD THE NO. OF THIS TEST
022260  012737  022476  001442                 MOV     #TST51,NEXT             ; POINT TO THE START OF NEXT TEST.
022266  012737  022304  001444                 MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
                                                                       ;R1 CONTAINS BASE KMC11 ADDRESS
022274  104410                                 MSTCLR                  ;MASTER CLEAR KMC11
022276  012700  000001                         MOV     #1,R0           ;START WITH A ONE
022302  005002                                 CLR     R2              ;R2 CONTAINS ADDRESS OF REGISTER
022304  010203                         1$:     MOV     R2,R3           ;R3=REGISTER ADDRESS
022306  010061  000004                         MOV     R0,4(R1)        ;WRITE DATA TO PORT4
022312  042737  000017  022326                 BIC     #17,5$          ;CLEAR ADDRESS FIELD OF INSTRUCTION
022320  050337  022326                         BIS     R3,5$           ;ADD ADDRESS TO INSTRUCTION
022324  104412                                 ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
022326  122100                         5$:     122100                  ;MOVE DATA TO IBUS REGISTER
022330  006303                                 ASL     R3              ;SHIFT ADDRESS
022332  006303                                 ASL     R3              ;4 TIMES TO GET
022334  006303                                 ASL     R3              ;IT TO BITS 4-7
022336  006303                                 ASL     R3              ;OF NEXT INSTRUCTION
022340  042737  000360  022354                 BIC     #360,6$         ;CLEAR ADDRESS FIELD
022346  050337  022354                         BIS     R3,6$           ;ADD ADDRESS TO INSTRUCTION
022352  104412                                 ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
022354  021005                         6$:     21005                   ;READ FROM IBUS REGISTER
022356  010005                                 MOV     R0,R5           ;PUT "EXPECTED" IN R5
022360  116104  000005                         MOVB    5(R1),R4        ;PUT "FOUND" IN R4
022364  120504                                 CMPB    R5,R4           ;IS DATA CORRECT?
022366  001401                                 BEQ     2$              ;BR IF YES
022370  104005                                 ERROR   5               ;DATA ERROR
022372  104405                         2$:     SCOP1                   ;SW09=1?
022374  005200                                 INC     R0              ;INCREMENT PATTERN
022376  005202                                 INC     R2              ;INCREMENT REGISTER ADDRESS
022400  022702  000010                         CMP     #7+1,R2 ;LAST ADDRESS DONE?
022404  001337                                 BNE     1$              ;BR IF NO
022406  012737  022424  001444                 MOV     #3$,LOCK        ;NEW SCOP1
022414  012700  000001                         MOV     #1,R0           ;RESTART PATTERN TO 1
022420  005002                                 CLR     R2              ;RESTART AT ADDRESS 0
022422  005003                                 CLR     R3              ;RESTART AT ADDRESS 0
022424  042737  000360  022440         3$:     BIC     #360,7$         ;CLEAR ADDRESS FIELD OF INSTRUCTION
022432  050337  022440                         BIS     R3,7$           ;ADD ADDRESS TO INSTRUCTION
022436  104412                                 ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
022440  021005                         7$:     21005                   ;READ FROM IBUS REGISTER
022442  010005                                 MOV     R0,R5           ;PUT "EXPECTED" IN R5
022444  116104  000005                         MOVB    5(R1),R4        ;PUT "FOUND" IN R5
022450  120504                                 CMPB    R5,R4           ;DATA CORRECT?
022452  001401                                 BEQ     4$              ;BR IF YES
022454  104005                                 ERROR   5               ;DUAL ADDRESSING ERROR
022456  104405                         4$:     SCOP1                   ;SW09=1?
022460  005200                                 INC     R0              ;INCREMENT PATTERN
022462  005202                                 INC     R2              ;NEXT ADDRESS
022464  062703  000020                         ADD     #20,R3          ;ADD 1 TO ADDRESS IN R3(SHIFTED 4 TIMES)
022470  022702  000010                         CMP     #7+1,R2 ;LAST ADDRESS DONE?
022474  001353                                 BNE     3$              ;BR IF NO
```

```



                                                ;************************** TEST 51 **************************
                                                ;*MICRO PROCESSOR BR REGISTER TEST
                                                ;*FLOAT A 1 THROUGH THE BR
                                                ;*FLOAT A 0 THROUGH THE BR
                                                ;:*********************************************************

                                                ;  TEST 51
                                                ;-------------

                                        ;:*********************************************************
022476  000004                          TST51:  SCOPE
022500  012737  000051  001202                  MOV     #51,$TSTNM              ; LOAD THE NO. OF THIS TEST
022506  012737  022646  001442                  MOV     #TST52,NEXT             ; POINT TO THE START OF NEXT TEST.
022514  012737  022530  001444                  MOV     #64$,LOCK               ; ADDRESS FOR LOCK ON DATA.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
022522  104410                                  MSTCLR                  ;MASTER CLEAR KMC11
022524  012700  000001                          MOV     #1,R0           ;START PATTERN WITH BIT0
022530                                  64$:
022530  010061  000004                          MOV     R0,4(R1)        ;WRITE PATTERN IN PORT4
022534  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
022536  120500                                  120500                  ;MOVE DATA TO THE BR REGISTER
022540  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
022542  061225                                  061225                  ;MOVE BR TO PORT 5
022544  010005                                  MOV     R0,R5           ;PUT "EXPECTED" IN R5
022546  116104  000005                          MOVB    5(R1),R4        ;PUT "FOUND" IN R4
022552  120504                                  CMPB    R5,R4           ;DATA CORRECT?
022554  001401                                  BEQ     65$             ;BR IF YES
022556  104006                                  ERROR   6               ;DATA ERROR
022560  104405                          65$:    SCOP1
022562  000241                                  CLC                     ;CLEAR CARRY
022564  106100                                  ROLB    R0              ;SHIFT BIT IN R0
022566  001360                                  BNE     64$             ;DONE IF R0=0
022570  012737  022604  001444                  MOV     #67$,LOCK       ;NEW SCOP1
022576  012700  000001                          MOV     #1,R0           ;START PATTERN WITH BIT0
022602  005100                          69$:    COM     R0              ;CHANGE TO FLOATING ZERO
022604                                  67$:
022604  010061  000004                          MOV     R0,4(R1)        ;WRITE PATTERN IN PORT4
022610  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
022612  120500                                  120500                  ;MOVE DATA TO THE BR REGISTER
022614  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
022616  061225                                  061225                  ;MOVE BR TO PORT 5
022620  010005                                  MOV     R0,R5           ;PUT "EXPECTED" IN R5
022622  116104  000005                          MOVB    5(R1),R4        ;PUT "FOUND" IN R4
022626  120504                                  CMPB    R5,R4           ;DATA CORRECT?
022630  001401                                  BEQ     68$             ;BR IF YES
022632  104006                                  ERROR   6               ;DATA ERROR
022634  104405                          68$:    SCOP1
022636  005100                                  COM     R0              ;CHANGE BACK TO A ONE
022640  000241                                  CLC                     ;CLEAR CARRY
022642  106100                                  ROLB    R0              ;SHIFT BIT IN R0
022644  001356                                  BNE     69$             ;DONE IF R0=0



                                                ;************************** TEST 52 **************************
                                                ;*SCRATCH PAD TEST
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                                                ;*FLOAT A 1 THROUGH EACH SCRATCH PAD LOCATION
                                                ;*FLOAT A 0 THROUGH EACH SCRATCH PAD LOCATION
                                                ;:*************************************************************

                                                ;   TEST 52
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                                        ;;*************************************************************
022646  000004                          TST52:  SCOPE
022650  012737  000052  001202                  MOV     #52,$TSTNM              ; LOAD THE NO. OF THIS TEST
022656  012737  023114  001442                  MOV     #TST53,NEXT             ; POINT TO THE START OF NEXT TEST.
022664  012737  022702  001444                  MOV     #64$,LOCK               ; ADDRESS FOR LOCK ON DATA.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
022672  104410                                  MSTCLR                  ;MASTER CLEAR KMC11
022674  005002                                  CLR     R2              ;START AT ADDRESS ZERO
022676  012700  000001                          MOV     #1,R0           ;START WITH BIT0
022702  042737  000017  022722          64$:    BIC     #17,65$         ;CLEAR ADDRESS FIELD OF INSTRUCTION
022710  050237  022722                          BIS     R2,65$          ;ADD ADDRESS TO INSTRUCTION
022714  010061  000004                          MOV     R0,4(R1)        ;WRITE PATTERN TO PORT4
022720  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
022722  123100                          65$:    123100                  ;WRITE SCRATCH PAD(ADDRESS IN R2)
022724  042737  000017  022740                  BIC     #17,66$         ;CLEAR ADDRESS FIELD OF INSTRUCTION
022732  050237  022740                          BIS     R2,66$          ;ADD ADDRESS TO INSTRUCTION
022736  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
022740  040600                          66$:    040600                  ;MOV SP TO BR
022742  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
022744  061225                                  061225                  ;MOVE BR TO PORT5
022746  010005                                  MOV     R0,R5           ;PUT "EXPECTED" IN R5
022750  116104  000005                          MOVB    5(R1),R4        ;PUT "FOUND" IN R4
022754  120504                                  CMPB    R5,R4           ;DATA CORRECT
022756  001401                                  BEQ     67$             ;BR IF YES
022760  104007                                  ERROR   7               ;DATA ERROR
022762  104405                          67$:    SCOP1                   ;SW09=1?
022764  000241                                  CLC                     ;CLEAR CARRY
022766  106100                                  ROLB    R0              ;SHIFT BIT IN R0
022770  001344                                  BNE     64$             ;DONE IF R0=0
022772  012737  023006  001444                  MOV     #69$,LOCK       ;NEW SCOP1
023000  012700  000001                          MOV     #1,R0           ;START WITH BIT0
023004  005100                          73$:    COM     R0              ;CHANGE TO FLOATING ZERO
023006  042737  000017  023026          69$:    BIC     #17,70$         ;CLEAR ADDRESS FIELD OF INSTRUCTION
023014  050237  023026                          BIS     R2,70$          ;ADD ADDRESS TO INSTRUCTION
023020  010061  000004                          MOV     R0,4(R1)        ;WRITE PATTERN TO PORT4
023024  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023026  123100                          70$:    123100                  ;WRITE SCRATCH PAD(ADDRESS IN R2)
023030  042737  000017  023044                  BIC     #17,71$         ;CLEAR ADDRESS FIELD OF INSTRUCTION
023036  050237  023044                          BIS     R2,71$          ;ADD ADDRESS TO INSTRUCTION
023042  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023044  040600                          71$:    040600                  ;MOV SP TO BR
023046  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023050  061225                                  061225                  ;MOVE BR TO PORT5
023052  010005                                  MOV     R0,R5           ;PUT "EXPECTED" IN R5
023054  116104  000005                          MOVB    5(R1),R4        ;PUT "FOUND" IN R4
023060  120504                                  CMPB    R5,R4           ;DATA CORRECT
023062  001401                                  BEQ     72$             ;BR IF YES
023064  104007                                  ERROR   7               ;DATA ERROR
023066  104405                          72$:    SCOP1                   ;SW09=1?
023070  005100                                  COM     R0              ;CHANGE BACK TO A ONE
```

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 023072  000241                                CLC                          ;CLEAR CARRY
 023074  106100                                ROLB      R0                 ;SHIFT BIT IN R0
 023076  001342                                BNE       73$                ;DONE IF R0=0
 023100  012700  000001                        MOV       #1,R0              ;RESTART AT BIT 0
 023104  005202                                INC       R2                 ;NEXT SP ADDRESS
 023106  022702  000020                        CMP       #20,R2  ;LAST ADDRESS?
 023112  001273                                BNE       64$                ;BR IF NO


                                       ;*************************** TEST 53 ***************************
                                       ;*SCRATCH PAD DUAL ADDRESSING TEST
                                       ;*WRITE AN INCREMENTING PATTERN IN ALL SP LOCATIONS
                                       ;*READ ALL SP LOCATIONS TO VERIFY CORRECT ADDRESSING
                                       ;;**************************************************************

                                       ;  TEST 53
                                       ;------------

                                   ;;*************************************************************
 023114  000004                    TST53:  SCOPE
 023116  012737  000053  001202            MOV       #53,$TSTNM           ; LOAD THE NO. OF THIS TEST
 023124  012737  023336  001442            MOV       #TST54,NEXT          ; POINT TO THE START OF NEXT TEST.
 023132  012737  023150  001444            MOV       #1$,LOCK             ; ADDRESS FOR LOCK ON DATA.
                                                                         ;R1 CONTAINS BASE KMC11 ADDRESS
 023140  104410                            MSTCLR                        ;MASTER CLEAR KMC11
 023142  012700  000001                    MOV       #1,R0               ;START WITH A 1
 023146  005003                            CLR       R3                  ;ADDRESS 0
 023150  010302                    1$:     MOV       R3,R2               ;MOVE ADDRESS TO R2
 023152  042737  000017  023172            BIC       #17,2$              ;CLEAR ADDRESS FIELD
 023160  050237  023172                    BIS       R2,2$               ;ADD ADDRESS TO INSTRUCTION
 023164  010061  000004                    MOV       R0,4(R1)            ;WRITE PATTERN TO PORT4
 023170  104412                            ROMCLK                        ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 023172  123100                    2$:     123100                        ;WRITE SP(ADDRESS IN R2)
 023174  042737  000017  023210            BIC       #17,3$              ;CLEAR ADDRESS FIELD OF INSTRUCTION
 023202  050237  023210                    BIS       R2,3$               ;ADD ADDRESS TO INSTRUCTION
 023206  104412                            ROMCLK                        ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 023210  060600                    3$:     60600                         ;MOV SP TO BR
 023212  104412                            ROMCLK                        ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 023214  061225                            61225                         ;MOV BR TO PORT5
 023216  010005                            MOV       R0,R5               ;PUT "EXPECTED" IN R5
 023220  116104  000005                    MOVB      5(R1),R4            ;PUT "FOUND" IN R4
 023224  120504                            CMPB      R5,R4               ;DATA CORRECT?
 023226  001401                            BEQ       4$                  ;BR IF YES
 023230  104007                            ERROR     7                   ;DATA ERROR
 023232  104405                    4$:     SCOP1                         ;SW09=0
 023234  005200                            INC       R0                  ;INCREMENT PATTERN
 023236  005203                            INC       R3                  ;NEXT ADDRESS
 023240  022703  000020                    CMP       #20,R3              ;LAST ADDRESS DONE?
 023244  001341                            BNE       1$                  ;BR IF NO
 023246  012737  023262  001444            MOV       #5$,LOCK            ;NEW SCOP1
 023254  012700  000001                    MOV       #1,R0               ;RESTART PATTERN AT 1
 023260  005003                            CLR       R3                  ;RESTART AT ADDRESS ZERO
 023262  010302                    5$:     MOV       R3,R2               ;PUT ADDRESS IN R2
 023264  042737  000017  023300            BIC       #17,6$              ;CLEAR ADDRESS FIELD OF INSTRUCTION
 023272  050237  023300                    BIS       R2,6$               ;ADD ADDRESS TO INSTRUCTION
 023276  104412                            ROMCLK                        ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 023300  060600                    6$:     60600                         ;MOV SP TO BR
```

```
023302  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023304  061225                          61225                           ;MOV BR TO PORTS
023306  010005                          MOV     R0,R5                   ;PUT "EXPECTED" IN R5
023310  116104  000005                  MOVB    5(R1),R4                ;PUT "FOUND" IN R4
023314  120504                          CMPB    R5,R4                   ;DATA CORRECT?
023316  001401                          BEQ     7$                      ;BR IF YES
023320  104007                          ERROR   7                       ;SP ADDRESSING ERROR
023322  104405                  7$:     SCOP1                           ;SW09=1?
023324  005200                          INC     R0                      ;INCREMENT PATTERN
023326  005203                          INC     R3                      ;NEXT ADDRESS
023330  022703  000020                  CMP     #20,R3  ;LAST ADDRESS DONE?
023334  001352                          BNE     5$                      ;BR IF NO


                                        ;*************************** TEST 54 **************************
                                        ;*INTERRUPT TEST
                                        ;*TEST THAT DEVICE CAN INTERRUPT TO VECTOR A
                                        ;:*************************************************************

                                        ;  TEST 54
                                        ;--------------

                                ;:************************************************************
023336  000004                  TST54:  SCOPE
023340  012737  000054  001202          MOV     #54,$TSTNM                      ; LOAD THE NO. OF THIS TEST
023346  012737  023432  001442          MOV     #TST55,NEXT                     ; POINT TO THE START OF NEXT TEST.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
023354  000005                          RESET                           ;BUS RESET
023356  005011                          CLR     (R1)                    ;CLEAR RUN
023360  004537  035516                  JSR     R5,SETVEC               ;SET UP VECTORS
023364  023426                          3$                              ;XX0
023366  023424                          2$                              ;XX4
023370     340     340                  .BYTE   340,340                 ;LEVEL 7
023372  012737  000340  177776  1$:     MOV     #340,PS                 ;PS = LEVEL 7
023400  012761  000200  000004          MOV     #200,4(R1)              ;WRITE PORT4
023406  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023410  121111                          121111                          ;SET BR RQ IN IBUS* REG 11
023412  005037  177776                  CLR     PS                      ;ALLOW INTERRUPT
023416  000240                          NOP
023420  104010                          ERROR   10                      ;NO INTERRUPT
023422  000403                          BR      4$
023424  104011                  2$:     ERROR   11                      ;WRONG VECTOR
023426  012706  001200          3$:     MOV     #STACK,SP               ;RESET STACK
023432                          4$:


                                        ;*************************** TEST 55 **************************
                                        ;*INTERRUPT TEST
                                        ;*TEST THAT DEVICE CAN INTERRUPT TO VECTOR B
                                        ;:*************************************************************

                                        ;  TEST 55
                                        ;--------------

                                ;:************************************************************
023432  000004                  TST55:  SCOPE
023434  012737  000055  001202          MOV     #55,$TSTNM                      ; LOAD THE NO. OF THIS TEST
023442  012737  023524  001442          MOV     #TST56,NEXT                     ; POINT TO THE START OF NEXT TEST.
```

```
                                                                ;R1 CONTAINS BASE KMC11 ADDRESS
023450  104410                          MSTCLR                  ;MASTER CLEAR KMC11
023452  004537  035516                  JSR     R5,SETVEC       ;SET UP VECTORS
023456  023516                          2$                      ;XX0
023460  023520                          3$                      ;XX4
023462     340     340                  .BYTE   340,340         ;LEVEL 7
023464  012737  000340  177776  1$:     MOV     #340,PS         ;PS = LEVEL 7
023472  012761  000300  000004          MOV     #300,4(R1)      ;WRITE PORT4
023500  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023502  121111                          121111                  ;SET BR RQ IN IBUS* REG 11
023504  005037  177776                  CLR     PS              ;ALLOW INTERRUPT
023510  000240                          NOP
023512  104010                          ERROR   10              ;NO INTERRUPT
023514  000403                          BR      4$
023516  104011                  2$:     ERROR   11              ;WRONG VECTOR
023520  012706  001200          3$:     MOV     #STACK,SP       ;RESET STACK
023524                          4$:


                                        ;************************* TEST 56 *************************
                                        ;*PRIORITY INTERRUPT TESTS
                                        ;*SET PS TO ALL BR LEVELS EQUAL OR GREATER THAN
                                        ;*THE KMC11 LEVEL,VERIFY THAT KMC11 DOES NOT INTERRUPT
                                        ;;*********************************************************

                                        ;  TEST 56
                                        ;-------------

                                ;;************************************************************
023524  000004                  TST56:  SCOPE
023526  012737  000056  001202          MOV     #56,$TSTNM              ; LOAD THE NO. OF THIS TEST
023534  012737  023646  001442          MOV     #TST57,NEXT             ; POINT TO THE START OF NEXT TEST.
                                                                ;R1 CONTAINS BASE KMC11 ADDRESS
023542  104410                          MSTCLR                  ;MASTER CLEAR KMC11
023544  012702  000340                  MOV     #340,R2         ;PUT LEVEL 7 IN R2
023550  010237  177776                  MOV     R2,PS           ;SET PRIORITY TO 7
023554  013700  002050                  MOV     STAT1,R0        ;GET BR LEVEL OF KMC11
023560  006200                          ASR     R0              ;SHIFT R0 4 TIMES
023562  006200                          ASR     R0              ;TO GET PROPER LEVEL
023564  006200                          ASR     R0
023566  006200                          ASR     R0
023570  042700  177437                  BIC     #177437,R0      ;CLEAR UNWANTED BITS
023574  004537  035516                  JSR     R5,SETVEC       ;SET UP VECTORS
023600  023642                          2$                      ;A VECTOR
023602  023642                          2$                      ;B VECTOR
023604     340     340                  .BYTE   340,340         ;PRIORITY 7
023606  012761  000200  000004  4$:     MOV     #200,4(R1)      ;LOAD PORT4
023614  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023616  121111                          121111                  ;SET BR REQUEST
023620  010237  177776          5$:     MOV     R2,PS           ;PUT LEVEL IN R2 IN PS
023624  000240                          NOP
023626  020002                          CMP     R0,R2           ;IS PRESENT PS LEVEL = TO KMC LEVEL
023630  001403                          BEQ     1$              ;BR IF YES
023632  162702  000040                  SUB     #40,R2          ;NO GET NEXT LOWER LEVEL IN R2
023636  000770                          BR      5$              ;AND CONTINUE WITH TEST
023640  104420                  1$:     ADVANCE                 ; ADVANCE LOOP
023642  104020                  2$:     ERROR   20              ;ERROR UNEXPECTED INTERRUPT
```

```
023644  000002                            RTI


                                          ;************************* TEST 57 *************************
                                          ;*PRIORITY INTERRUPT TESTS
                                          ;*SET PS TO ALL BR LEVELS LESS THAN THE KMC11 LEVEL
                                          ;*VERIFY THAT THE KMC11 WILL INTERRUPT
                                          ;:***********************************************************

                                          ;  TEST 57
                                          ;--------------
                                          ;
                                     ;:*******************************************************************
023646  000004                       TST57:  SCOPE
023650  012737  000057  001202               MOV     #57,$TSTNM             ; LOAD THE NO. OF THIS TEST
023656  012737  024014  001442               MOV     #TST60,NEXT            ; POINT TO THE START OF NEXT TEST.
                                                                    ;R1 CONTAINS BASE KMC11 ADDRESS
023664  104410                               MSTCLR                 ;MASTER CLEAR KMC11
023666  012702  000340                       MOV     #340,R2        ;PUT LEVEL 7 IN R2
023672  010237  177776                       MOV     R2,PS          ;SET PRIORITY TO 7
023676  013700  002050                       MOV     STAT1,R0       ;GET BR LEVEL OF KMC11
023702  006200                               ASR     R0             ;SHIFT R0 4 TIMES
023704  006200                               ASR     R0             ;TO GET PROPER LEVEL
023706  006200                               ASR     R0
023710  006200                               ASR     R0
023712  042700  177437                       BIC     #177437,R0     ;CLEAR UNWANTED BITS
023716  010002                               MOV     R0,R2          ;PUT KMC LEVEL IN R2
023720  162702  000040                       SUB     #40,R2         ;GET NEXT LOWER LEVEL IN R2
023724  004537  035516                       JSR     R5,SETVEC      ;SET UP VECTORS
023730  023776                               2$                     ;A VECTOR
023732  024004                               3$                     ;B VECTOR
023734     340     340                       .BYTE   340,340        ;PRIORITY 7
023736  012761  000200  000004       4$:     MOV     #200,4(R1)     ;LOAD PORT4
023744  104412                               ROMCLK                 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023746  121111                               121111                 ;SET BR REQUEST
023750  010237  177776               5$:     MOV     R2,PS          ;PUT LEVEL IN R2 IN PS
023754  000240                               NOP
023756  104010                               ERROR   10             ;ERROR, NO INTERRUPT
023760  022702  000140               6$:     CMP     #140,R2        ;IS IT DOWN TO LEVEL 3 YET?
023764  001403                               BEQ     1$             ;YES,KMC DID NOT INTERUPT, ERROR
023766  162702  000040                       SUB     #40,R2         ;PUT NEXT LOWER LEVEL IN R2
023772  000761                               BR      4$             ;CONTINUE TEST
023774  104420                       1$:     ADVANCE                ; ADVANCE LOOP
023776  012716  023760               2$:     MOV     #6$,(SP)       ;SET UP FOR RTI
024002  000002                               RTI
024004  104011                       3$:     ERROR   11             ;ERROR, WRONG VECTOR
024006  012716  023760                       MOV     #6$,(SP)       ;SET UP FOR RTI
024012  000002                               RTI


                                          ;************************* TEST 60 *************************
                                          ;*NPR TEST
                                          ;*TEST OF DATO, 1 WORD FROM UPROC TO 11 MEMORY
                                          ;:***********************************************************

                                          ;  TEST 60
                                          ;-------------
```

```
                                        ;;*******************************************************************
024014  000004                          TST60:  SCOPE
024016  012737  000060  001202                  MOV     #60,$TSTNM                  ; LOAD THE NO. OF THIS TEST
024024  012737  024122  001442                  MOV     #TST61,NEXT                 ; POINT TO THE START OF NEXT TEST.
                                                                            ;R1 CONTAINS BASE KMC11 ADDRESS
024032  000005                                  RESET                       ;BUS RESET
024034  005011                                  CLR     (R1)                ;CLEAR RUN
024036  005061  000004                          CLR     4(R1)               ;CLR PORT4
024042  004537  035540                          JSR     R5,NPRSET           ;SET UP IBUS REG 0-7
024046  000000                                  0                           ;IN DATA
024050  177777                                  -1                          ;OUT DATA
024052  024120                                  3$                          ;IN BA
024054  024116                                  2$                          ;OUT BA
024056  005037  024116                          CLR     2$                  ;CLEAR 2$
024062  012761  000021  000004                  MOV     #21,4(R1)           ;WRITE PORT4
024070  104412                                  ROMCLK                      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
024072  121110                                  121110                      ;SET NPR BITS IN IBUS* REG 11
024074  000240                                  NOP
024076  012705  177777                          MOV     #-1,R5              ;PUT "EXPECTED" IN R5
024102  013704  024116                          MOV     2$,R4               ;PUT "FOUND" IN R4
024106  020504                                  CMP     R5,R4               ;DATA CORRECT?
024110  001401                                  BEQ     4$                  ;BR IF YES
024112  104012                                  ERROR   12                  ;ERROR NPR FAILED
024114  104420                          4$:     ADVANCE                     ; ADVANCE LOOP
024116  000000                          2$:     0                           ;OUT BA
024120  000000                          3$:     0                           ;IN BA


                                                ;************************* TEST 61 *************************
                                                ;*NPR TEST
                                                ;*TEST OF DATI, 1 WORD FROM 11 MEMORY TO UPROC
                                                ;:**********************************************************

                                                ;  TEST 61
                                                ;-------------
                                        ;;*******************************************************************
024122  000004                          TST61:  SCOPE
024124  012737  000061  001202                  MOV     #61,$TSTNM                  ; LOAD THE NO. OF THIS TEST
024132  012737  024240  001442                  MOV     #TST62,NEXT                 ; POINT TO THE START OF NEXT TEST.
                                                                            ;R1 CONTAINS BASE KMC11 ADDRESS
024140  104410                                  MSTCLR                      ;MASTER CLEAR KMC11
024142  005061  000004                          CLR     4(R1)               ;CLR PORT4
024146  004537  035540                          JSR     R5,NPRSET           ;SET UP IBUS REG 0-7
024152  000000                                  0                           ;IN DATA
024154  177777                                  -1                          ;OUT DATA
024156  024236                                  3$                          ;IN BA
024160  024234                                  2$                          ;OUT BA
024162  012737  177777  024236                  MOV     #-1,3$              ;PUT DATA IN 3$
024170  012761  000001  000004                  MOV     #1,4(R1)            ;WRITE PORT4
024176  104412                                  ROMCLK                      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
024200  121110                                  121110                      ;SET NPR BITS IN IBUS* REG 11
024202  000240                                  NOP
024204  012705  177777                          MOV     #-1,R5              ;PUT "EXPECTED" IN R5
024210  104412                                  ROMCLK                      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
024212  021004                                  021004                      ;MOVE IN DATA LOW BYTE TO PORT4
024214  104412                                  ROMCLK                      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
```

```
024216  021025                           021025                          ;MOVE IN DATA HIGH BYTE TO PORTS
024220  016104  000004                   MOV     4(R1),R4                ;PUT "FOUND" IN R4
024224  020504                           CMP     R5,R4                   ;DATA CORRECT?
024226  001401                           BEQ     4$                      ;BR IF YES
024230  104012                           ERROR   12                      ;ERROR NPR FAILED
024232  104420                   4$:     ADVANCE                         ; ADVANCE LOOP
024234  000000                   2$:     0                               ;OUT BA
024236  000000                   3$:     0                               ;IN BA


                                         ;************************** TEST 62 **************************
                                         ;*NPR TEST
                                         ;*TEST OF DATOB, 1 BYTE FROM UPROC TO 11 MEMORY
                                         ;;************************************************************

                                         ;  TEST 62
                                         ;--------------
                                 ;;*************************************************************
024240  000004                   TST62:  SCOPE
024242  012737  000062  001202           MOV     #62,$TSTNM                ; LOAD THE NO. OF THIS TEST
024250  012737  024344  001442           MOV     #TST63,NEXT               ; POINT TO THE START OF NEXT TEST.
                                                                         ;R1 CONTAINS BASE KMC11 ADDRESS
024256  104410                           MSTCLR                          ;MASTER CLEAR KMC11
024260  005061  000004                   CLR     4(R1)                   ;CLR PORT4
024264  004537  035540                   JSR     R5,NPRSET               ;SET UP IBUS REG 0-7
024270  000000                           0                               ;IN DATA
024272  177777                           -1                              ;OUT DATA
024274  024342                           3$                              ;IN BA
024276  024341                           2$+1            ;OUT BA
024300  005037  024340                   CLR     2$                      ;CLEAR 2$
024304  012761  000221  000004           MOV     #221,4(R1)              ;WRITE PORT4
024312  104412                           ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
024314  121110                           121110                          ;SET NPR BITS IN IBUS* REG 11
024316  000240                           NOP
024320  012705  177400                   MOV     #177400,R5                  ;PUT "EXPECTED" IN R5
024324  013704  024340                   MOV     2$,R4                   ;PUT "FOUND" IN R4
024330  020504                           CMP     R5,R4                   ;DATA CORRECT?
024332  001401                           BEQ     4$                      ;BR IF YES
024334  104012                           ERROR   12                      ;ERROR NPR FAILED
024336  104420                   4$:     ADVANCE                         ; ADVANCE LOOP
024340  000000                   2$:     0                               ;OUT BA
024342  000000                   3$:     0                               ;IN BA


                                         ;************************** TEST 63 **************************
                                         ;*TEST OF EA BITS 16 AND 17
                                         ;*DO A DATO TO AN ADDRESS USING OUT BA BITS 16 AND 17
                                         ;*VERIFY CORRECT RESULTS
                                         ;;************************************************************

                                         ;  TEST 63
                                         ;--------------
                                 ;;*************************************************************
024344  000004                   TST63:  SCOPE
024346  012737  000063  001202           MOV     #63,$TSTNM                ; LOAD THE NO. OF THIS TEST
024354  012737  024502  001442           MOV     #TST64,NEXT               ; POINT TO THE START OF NEXT TEST.
```

```
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
024362  104410                                  MSTCLR                  ;MASTER CLEAR KMC11
024364  013737  002074  024412                  MOV     KMP04,1$        ;USE SEL4 FOR ADDRESS
024372  013737  002074  024410                  MOV     KMP04,2$        ;USE SEL4 FOR ADDRESS
024400  004537  035540                          JSR     R5,NPRSET       ;LOAD BA AND DATA
024404  000000                                  0                       ;IN DATA
024406  125252                                  125252                  ;OUT DATA
024410  000000                          2$:     0                       ;IN BA
024412  000000                          1$:     0                       ;OUT BA
024414  012761  000014  000004                  MOV     #14,4(R1)       ;LOAD SEL 4 WITH OUT BA16 AND 17
024422  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
024424  121111                                  121111                  ;SET OUTBA 16 AND 17
024426  012761  000021  000004                  MOV     #21,4(R1)       ;LOAD SEL4
024434  012761  121110  000006                  MOV     #121110,6(R1)   ;PUT INSTRUCTION IN SEL6
024442  012711  003000                          MOV     #BIT9!BIT10,(R1);SET CROMI AND CROMO!!
024446  052711  000400                          BIS     #BIT8,(R1)      ;CLOCK IT!
024452  000240                                  NOP                     ;WAIT FOR NPR
024454  012705  121110                          MOV     #121110,R5      ;PUT "EXPECTED" IN R5
024460  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
024462  021044                                  021044                  ;MOVE OUT DATA LB TO SEL4
024464  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
024466  021065                                  021065                  ;MOVE OUT DATA HB TO SEL5
024470  016104  000004                          MOV     4(R1),R4        ;PUT "FOUND" IN R4
024474  020504                                  CMP     R5,R4           ;CORRECT RESULTS ?
024476  001401                                  BEQ     3$              ;BR IF YES
024500  104012                                  ERROR   12              ;ERROR BA 16 AND 17 FAILED
024502                                  3$:



                                        ;************************** TEST 64 **************************
                                        ;*TEST OF EA BITS 16 AND 17
                                        ;*DO A DATI USING IN BA BITS 16 AND 17
                                        ;*VERIFY CORRECT RESULTS
                                        ;**************************************************************

                                        ;  TEST 64
                                        ;_____________

                                ;;*************************************************************
024502  000004                  TST64:  SCOPE
024504  012737  000064  001202          MOV     #64,$TSTNM              ; LOAD THE NO. OF THIS TEST
024512  012737  024626  001442          MOV     #TST65,NEXT             ; POINT TO THE START OF NEXT TEST.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
024520  104410                                  MSTCLR                  ;MASTER CLEAR KMC11
024522  013737  002074  024550                  MOV     KMP04,1$        ;USE SEL4 FOR ADDRESS
024530  013737  002074  024546                  MOV     KMP04,2$        ;USE SEL4 FOR ADDRESS
024536  004537  035540                          JSR     R5,NPRSET       ;LOAD BA AND DATA
024542  000000                                  0                       ;IN DATA
024544  125252                                  125252                  ;OUT DATA
024546  000000                          2$:     0                       ;IN BA
024550  000000                          1$:     0                       ;OUT BA
024552  012761  000015  000004                  MOV     #15,4(R1)       ;LOAD SEL4
024560  012761  121110  000006                  MOV     #121110,6(R1)   ;PUT INSTRUCTION IN SEL6
024566  012711  003000                          MOV     #BIT9!BIT10,(R1);SET CROMI AND CROMO!!
024572  052711  000400                          BIS     #BIT8,(R1)      ;CLOCK IT!
024576  000240                                  NOP                     ;WAIT FOR NPR
024600  012705  121110                          MOV     #121110,R5      ;PUT "EXPECTED" IN R5
```

```
024604  104412                             ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
024606  021004                             021004                          ;MOVE IN DATA LB TO SEL4
024610  104412                             ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
024612  021025                             021025                          ;MOVE IN DATA HB TO SEL5
024614  016104  000004                     MOV     4(R1),R4                ;PUT "FOUND" IN R4
024620  020504                             CMP     R5,R4                   ;CORRECT RESULTS ?
024622  001401                             BEQ     3$                      ;BR IF YES
024624  104012                             ERROR   12                      ;ERROR BA 16 AND 17 FAILED
024626                             3$:



                                   ;************************** TEST 65 **************************
                                   ;*NPR NON-EXISTENT MEMORY TEST
                                   ;*DO A DATO TO A NON-EXISTENT ADDRESS
                                   ;*VERIFY THAT THE NON-EXISTENT BIT SET IN IBUS REG 11
                                   ;;*************************************************************

                                   ;  TEST 65
                                   ;--------------

                           ;;**********************************************************************
024626  000004             TST65:  SCOPE
024630  012737  000065  001202     MOV     #65,$TSTNM              ; LOAD THE NO. OF THIS TEST
024636  012737  024736  001442     MOV     #TST66,NEXT             ; POINT TO THE START OF NEXT TEST.
                                                                   ;R1 CONTAINS BASE KMC11 ADDRESS
024644  104410                     MSTCLR                          ;MASTER CLEAR KMC11
024646  004537  035540             JSR     R5,NPRSET               ;LOAD IBUS REGISTERS 0-7
024652  000000                     0                               ;IN DATA
024654  000000                     0                               ;OUT DATA
024656  177320                     177320                          ;IN BA
024660  177320                     177320                          ;OUT BA
024662  012761  000014  000004     MOV     #14,4(R1)               ;SET OUT BA BITS 16+17 IN PORT4
024670  104412                     ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
024672  121111                     121111                          ;SET OUTBA 16 AND 17
024674  012761  000021  000004     MOV     #21,4(R1)               ;SET NPR REQUEST BITS IN PORT4
024702  104412                     ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
024704  121110                     121110                          ;MOV IBUS# 4 TO IBUS# 10
024706  000240                     NOP
024710  104412                     ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
024712  121225                     121225                          ;MOV IBUS#11 TO IBUS#5
024714  012705  000001             MOV     #1,R5                   ;PUT "EXPECTED" IN R5
024720  116104  000005             MOVB    5(R1),R4                ;PUT "FOUND" IN R4
024724  042704  177776             BIC     #177776,R4              ;CLEAR UNWANTED BITS
024730  020504                     CMP     R5,R4                   ;DATA CORRECT?
024732  001401                     BEQ     1$                      ;BR IF YES
024734  104012                     ERROR   12                      ;ERROR NON-EXISTENT MEM BIT FAILED TO SET
024736                     1$:



                                   ;************************** TEST 66 **************************
                                   ;*NPR NON-EXISTENT MEMORY TEST
                                   ;*DO A DATI FROM A NON-EXISTENT ADDRESS
                                   ;*VERIFY THAT THE NON-EXISTENT BIT SET IN IBUS REG 11
                                   ;;*************************************************************

                                   ;  TEST 66
                                   ;--------------
```

```
                                        ;;*************************************************************
024736  000004                          TST66:  SCOPE
024740  012737  000066  001202                  MOV     #66,$TSTNM              ; LOAD THE NO. OF THIS TEST
024746  012737  025044  001442                  MOV     #TST67,NEXT             ; POINT TO THE START OF NEXT TEST.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
024754  104410                                  MSTCLR                  ;MASTER CLEAR KMC11
024756  004537  035540                          JSR     R5,NPRSET       ;LOAD IBUS REGISTERS 0-7
024762  000000                                  0                       ;IN DATA
024764  000000                                  0                       ;OUT DATA
024766  177320                                  177320                  ;IN BA
024770  177320                                  177320                  ;OUT BA
024772  005061  000004                          CLR     4(R1)
024776  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
025000  121111                                  121111                  ;CLEAR NON-EXISTENT BIT
025002  012761  000015  000004                  MOV     #15,4(R1)       ;SET NPR REQUEST BITS IN PORT4
025010  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
025012  121110                                  121110                  ;MOV IBUS# 4 TO IBUS# 10
025014  000240                                  NOP
025016  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
025020  121225                                  121225                  ;MOV IBUS#11 TO IBUS#5
025022  012705  000001                          MOV     #1,R5           ;PUT "EXPECTED" IN R5
025026  116104  000005                          MOVB    5(R1),R4        ;PUT "FOUND" IN R4
025032  042704  177776                          BIC     #177776,R4      ;CLEAR UNWANTED BITS
025036  020504                                  CMP     R5,R4           ;DATA CORRECT?
025040  001401                                  BEQ     1$              ;BR IF YES
025042  104012                                  ERROR   12              ;ERROR NON-EXISTENT MEM BIT FAILED TO SET
025044                                  1$:



                                                ;*************************** TEST 67 ***************************
                                                ;*NPR TEST
                                                ;*USING DATO, NPR A BINARY COUNT (0-377 )
                                                ;*FROM MICRO-PROCESSOR TO ALL AVAILABLE MEMORY
                                                ;;*************************************************************

                                                ;  TEST 67
                                                ;-------------

                                        ;;*************************************************************
025044  000004                          TST67:  SCOPE
025046  012737  000067  001202                  MOV     #67,$TSTNM              ; LOAD THE NO. OF THIS TEST
025054  012737  000003  001310                  MOV     #3,$TIMES               ; LOAD ITERATION COUNT
025062  012737  025244  001442                  MOV     #TST70,NEXT             ; POINT TO THE START OF NEXT TEST.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
025070  104410                                  MSTCLR                  ;MASTER CLEAR KMC11
025072  005037  025242                          CLR     5$              ;START FLAG AT 0
025076  005000                                  CLR     R0              ;DATA
025100  012702  037234                          MOV     #CORMAX,R2      ;ADDRESS
025104                                  1$:
025104  010037  025134                          MOV     R0,2$           ;LOAD DATA
025110  010237  025140                          MOV     R2,4$           ;LOAD BA
025114  032702  000001                          BIT     #BIT0,R2        ;IS BA ODD?
025120  001402                                  BEQ     .+6             ;BR IF NO
025122  000337  025134                          SWAB    2$              ;IF ODD PUT DATA IN HI-BYTE
025126  004537  035540                          JSR     R5,NPRSET       ;LOAD NPR REGISTERS
025132  000000                                  0                       ;IN DATA
025134  000000                          2$:     0                       ;OUT DATA
```

```
025136  000000                              0                       ;IN BA
025140  000000                      4$:     0                       ;OUT BA
025142  105012                              CLRB    (R2)            ;CLEAR MEMORY LOCATION
025144  012761  000221  000004              MOV     #221,4(R1)      ;LOAD PORT4
025152  104412                              ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
025154  121110                              121110                  ;DO THE NPR
025156  000240                              NOP
025160  010005                              MOV     R0,R5           ;PUT "EXPECTED" IN R5
025162  111204                              MOVB    (R2),R4         ;PUT "FOUND" IN R4
025164  120504                              CMPB    R5,R4           ;IS DATA CORRECT?
025166  001401                              BEQ     3$              ;BR IF YES
025170  104021                              ERROR   21              ;ERROR, DATA INCORRECT
025172  104405                      3$:     SCOP1
025174  005200                              INC     R0              ;NEXT CHARACTER
025176  042700  177400                      BIC     #177400,R0      ;USE ONLY LOW BYTE
025202  005737  025242                      TST     5$              ;HAS MAX MEMORY BEEN REACHED YET?
025206  001402                              BEQ     6$              ;BR IF NO
025210  005700                              TST     R0              ;DONE PATTERN?
025212  001412                              BEQ     7$              ;BR IF YES
025214  005202                      6$:     INC     R2              ;INC BA
025216  023702  001466                      CMP     MEMLIM,R2       ;REACHED MEMORY LIMIT YET?
025222  001330                              BNE     1$              ;BR IF NOT
025224  012702  037234                      MOV     #CORMAX,R2      ;RESTART BA AT FIRST ADDRESS
025230  012737  177777  025242              MOV     #-1,5$          ;SET FLAG TO END TEST AT END OF DATA PATTERN
025236  000722                              BR 1$                   ;CONTINUE
025240  104420                      7$:     ADVANCE                 ; ADVANCE LOOP
025242  000000                      5$:     0                       ;THIS LOCATION IS A FLAG,  IT STARTS AT 0,
                                                                    ;AND IS SET TO -1 WHEN LAST MEMORY ADDRESS
                                                                    ;IS USED, TEST IS THEN ENDED WHEN PATTERN IS FINISHED
                                    ;$MEM1
                                    ;$MEM0
                                    ;$MEM2  1K
                                    ;$MEM3  1K


                                            ;*************************** TEST 70 ***************************
                                            ;*ALU C BIT TEST
                                            ;*TEST THAT AN ADD OF 377 AND 377 WILL SET THE C BIT
                                            ;:**************************************************************

                                            ;  TEST 70
                                            ;-------------

                                    ;;************************************************************
025244  000004                      TST70:  SCOPE
025246  012737  000070  001202              MOV     #70,$TSTNM              ; LOAD THE NO. OF THIS TEST
025254  012737  025360  001442              MOV     #TST71,NEXT             ; POINT TO THE START OF NEXT TEST.
025262  012737  025306  001444              MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
                                                                    ;R1 CONTAINS BASE KMC11 ADDRESS
025270  104410                              MSTCLR                  ;MASTER CLEAR KMC11
025272  004737  035602                      JSR     PC,MEMLD        ;LOAD MAINMEM DATA
025276  025350                              TDATA                   ;POINTER TO DATA
025300  004737  035636                      JSR     PC,SPLD         ;LOAD SP DATA
025304  025350                              TDATA                   ;POINTER TO DATA
025306                              1$:
025306  104412                              ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
025310  010000                              010000                  ;MAR←0
```

```
025312  104412                            ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
025314  054400                            054400!<0*20>                   ;ADD 377 AND 377, TO SET C BIT
025316  104412                            ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
025320  040421                            040401!<1*20>                   ;ADD 0 AND 0 AND THE C BIT
025322  104412                            ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
025324  061224                            61224                           ;PUT RESULTS IN PORT4
025326  012705  000001                    MOV     #1,R5                   ;PUT "EXPECTED" IN R5
025332  016104  000004                    MOV     4(R1),R4                ;PUT "FOUND" IN R4
025336  120504                            CMPB    R5,R4                   ;DATA CORRECT?
025340  001401                            BEQ     2$                      ;BR IF YES
025342  104015                            ERROR   15                      ;ERROR C BIT NOT SET
025344  104405                    2$:     SCOP1                           ;SW09=1?
025346  104420                            ADVANCE                         ; ADVANCE LOOP
025350     377     000     000    TDATA:  .BYTE   -1,0,0,0,0,0,0,0
025353     000     000     000
025356     000     000
                                  .EVEN



                                          ;************************** TEST 71 **************************
                                          ;*ALU TEST
                                          ;*TEST OF ALU FUNCTION SEL B WITH C BIT CLEARED
                                          ;*ALU FUNCTION (B)      CODE=11
                                          ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                          ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                          ;:*************************************************************


                                          ;  TEST 71
                                          ;_____________

                                  ;;*****************************************************************
025360  000004                    TST71:  SCOPE
025362  012737  000071  001202            MOV     #71,$TSTNM                      ; LOAD THE NO. OF THIS TEST
025370  012737  025536  001442            MOV     #TST72,NEXT                     ; POINT TO THE START OF NEXT TEST.
025376  012737  025430  001444            MOV     #1$,LOCK                        ; ADDRESS FOR LOCK ON DATA.
                                                                          ;R1 CONTAINS BASE KMC11 ADDRESS
025404  104410                            MSTCLR                          ;MASTER CLEAR KMC11
025406  005000                            CLR     R0                      ;MEM + SP ADDRESS
025410  012702  025526                    MOV     #5$,R2                  ;POINTER TO CORRECT DATA
025414  004737  035602                    JSR     PC,MEMLD                ;LOAD 8 WORDS OF MAIN MEMORY
025420  035726                            MEMDAT                          ;POINTER TO DATA
025422  004737  035636                    JSR     PC,SPLD                 ;LOAD 8 WORDS OF SP
025426  035736                            SPDAT                           ;POINTER TO DATA
025430  004737  035702            1$:     JSR     PC,CLRC                 ;CLEAR C BIT!
025434  042737  000017  025450            BIC     #17,2$                  ;CLEAR ADDRESS FIELD OF INSTRUCTION
025442  050037  025450                    BIS     R0,2$                   ;ADD ADDRESS TO INSTRUCTION
025446  104412                            ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
025450  010000                    2$:     010000                          ;LOAD MAR
025452  042737  000017  025466            BIC     #17,3$                  ;CLEAR ADDRESS OF INSTRUCTION
025460  050037  025466                    BIS     R0,3$                   ;ADD ADDRESS TO INSTRUCTION
025464  104412                            ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
025466  040620                    3$:     040400!<11*20>                  ;BR ← SEL B
025470  104412                            ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
025472  061224                            61224                           ;MOVE BR TO PORT4
025474  111205                            MOVB    (R2),R5                 ;PUT "EXPECTED" IN R5
025476  116104  000004                    MOVB    4(R1),R4                ;PUT "FOUND" IN R4
025502  120504                            CMPB    R5,R4                   ;DATA CORRECT?
```

```
025504  001401                                BEQ     4$                      ;BR IF YES
025506  104015                                ERROR   15                      ;ALU ERROR
025510  104405                        4$:     SCOP1                           ;SW09=1?
025512  005202                                INC     R2                      ;NEXT DATA
025514  005200                                INC     R0                      ;NEXT ADDRESS
025516  022700  000010                        CMP     #10,R0                  ;DONE YET?
025522  001342                                BNE     1$                      ;BR IF NO
025524  104420                                ADVANCE                         ; ADVANCE LOOP
025526     000     377     000        5$:     .BYTE   0,-1,0,-1,125,252,125,252
025531     377     125     252
025534     125     252
                                      .EVEN



                                              ;************************ TEST 72 ************************
                                              ;*ALU TEST
                                              ;*TEST OF ALU FUNCTION SEL A WITH C BIT CLEARED
                                              ;*ALU FUNCTION (A)     CODE=10
                                              ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                              ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                              ;**********************************************************

                                              ;  TEST 72
                                              ;_____________

                                      ;;*********************************************************
025536  000004                        TST72:  SCOPE
025540  012737  000072  001202                MOV     #72,$TSTNM                      ; LOAD THE NO. OF THIS TEST
025546  012737  025714  001442                MOV     #TST73,NEXT                     ; POINT TO THE START OF NEXT TEST.
025554  012737  025606  001444                MOV     #1$,LOCK                        ; ADDRESS FOR LOCK ON DATA.
                                                                      ;R1 CONTAINS BASE KMC11 ADDRESS
025562  104410                                MSTCLR                  ;MASTER CLEAR KMC11
025564  005000                                CLR     R0              ;MEM + SP ADDRESS
025566  012702  025704                        MOV     #5$,R2          ;POINTER TO CORRECT DATA
025572  004737  035602                        JSR     PC,MEMLD        ;LOAD 8 WORDS OF MAIN MEMORY
025576  035726                                MEMDAT                  ;POINTER TO DATA
025600  004737  035636                        JSR     PC,SPLD         ;LOAD 8 WORDS OF SP
025604  035736                                SPDAT                   ;POINTER TO DATA
025606  004737  035702                1$:     JSR     PC,CLRC         ;CLEAR C BIT!
025612  042737  000017  025626                BIC     #17,2$          ;CLEAR ADDRESS FIELD OF INSTRUCTION
025620  050037  025626                        BIS     R0,2$           ;ADD ADDRESS TO INSTRUCTION
025624  104412                                ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
025626  010000                        2$:     010000                  ;LOAD MAR
025630  042737  000017  025644                BIC     #17,3$          ;CLEAR ADDRESS OF INSTRUCTION
025636  050037  025644                        BIS     R0,3$           ;ADD ADDRESS TO INSTRUCTION
025642  104412                                ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
025644  040600                        3$:     040400!<10*20>          ;BR + SEL A
025646  104412                                ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
025650  061224                                61224                   ;MOVE BR TO PORT4
025652  111205                                MOVB    (R2),R5         ;PUT "EXPECTED" IN R5
025654  116104  000004                        MOVB    4(R1),R4        ;PUT "FOUND" IN R4
025660  120504                                CMPB    R5,R4           ;DATA CORRECT?
025662  001401                                BEQ     4$              ;BR IF YES
025664  104015                                ERROR   15              ;ALU ERROR
025666  104405                        4$:     SCOP1                   ;SW09=1?
025670  005202                                INC     R2              ;NEXT DATA
025672  005200                                INC     R0              ;NEXT ADDRESS
```

```
025674  022700  000010                  CMP     #10,R0                  ;DONE YET?
025700  001342                          BNE     1$                      ;BR IF NO
025702  104420                          ADVANCE                         ; ADVANCE LOOP
025704     000     000     377  5$:     .BYTE   0,0,-1,-1,125,125,252,252
025707     377     125     125
025712     252     252
                                .EVEN



                                        ;************************* TEST 73 *************************
                                        ;*ALU TEST
                                        ;*TEST OF ALU FUNCTION A OR NOTB WITH C BIT CLEARED
                                        ;*ALU FUNCTION (A OR NOTB)     CODE=12
                                        ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                        ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                        ;:***********************************************************

                                        ;  TEST 73
                                        ;--------------
                                ;:***********************************************************
025714  000004                  TST73:  SCOPE
025716  012737  000073  001202          MOV     #73,$TSTNM              ; LOAD THE NO. OF THIS TEST
025724  012737  026072  001442          MOV     #TST74,NEXT             ; POINT TO THE START OF NEXT TEST.
025732  012737  025764  001444          MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
                                                                ;R1 CONTAINS BASE KMC11 ADDRESS
025740  104410                          MSTCLR                  ;MASTER CLEAR KMC11
025742  005000                          CLR     R0              ;MEM + SP ADDRESS
025744  012702  026062                  MOV     #5$,R2          ;POINTER TO CORRECT DATA
025750  004737  035602                  JSR     PC,MEMLD        ;LOAD 8 WORDS OF MAIN MEMORY
025754  035726                          MEMDAT                  ;POINTER TO DATA
025756  004737  035636                  JSR     PC,SPLD         ;LOAD 8 WORDS OF SP
025762  035736                          SPDAT                   ;POINTER TO DATA
025764  004737  035702          1$:     JSR     PC,CLRC         ;CLEAR C BIT!
025770  042737  000017  026004          BIC     #17,2$          ;CLEAR ADDRESS FIELD OF INSTRUCTION
025776  050037  026004                  BIS     R0,2$           ;ADD ADDRESS TO INSTRUCTION
026002  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
026004  010000                  2$:     010000                  ;LOAD MAR
026006  042737  000017  026022          BIC     #17,3$          ;CLEAR ADDRESS OF INSTRUCTION
026014  050037  026022                  BIS     R0,3$           ;ADD ADDRESS TO INSTRUCTION
026020  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
026022  040640                  3$:     040400!<12*20>          ;BR ← A OR NOTB
026024  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
026026  061224                          61224                   ;MOVE BR TO PORT4
026030  111205                          MOVB    (R2),R5         ;PUT "EXPECTED" IN R5
026032  116104  000004                  MOVB    4(R1),R4        ;PUT "FOUND" IN R4
026036  120504                          CMPB    R5,R4           ;DATA CORRECT?
026040  001401                          BEQ     4$              ;BR IF YES
026042  104015                          ERROR   15              ;ALU ERROR
026044  104405                  4$:     SCOP1                   ;SW09=1?
026046  005202                          INC     R2              ;NEXT DATA
026050  005200                          INC     R0              ;NEXT ADDRESS
026052  022700  000010                  CMP     #10,R0          ;DONE YET?
026056  001342                          BNE     1$              ;BR IF NO
026060  104420                          ADVANCE                 ; ADVANCE LOOP
026062     377     000     377  5$:     .BYTE   -1,0,-1,-1,-1,125,252,-1
026065     377     377     125
```

```
026070     252     377
                                      .EVEN



                                                    ;************************* TEST 74 *************************
                                                    ;*ALU TEST
                                                    ;*TEST OF ALU FUNCTION A AND B WITH C BIT CLEARED
                                                    ;*ALU FUNCTION (A AND B)    CODE=13
                                                    ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                                    ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                                    ;:*********************************************************

                                                    ;  TEST 74
                                                    ;--------------
                                      ;:*****************************************************
026072  000004                        TST74:  SCOPE
026074  012737  000074  001202                MOV     #74,$TSTNM                ; LOAD THE NO. OF THIS TEST
026102  012737  026250  001442                MOV     #TST75,NEXT               ; POINT TO THE START OF NEXT TEST.
026110  012737  026142  001444                MOV     #1$,LOCK                  ; ADDRESS FOR LOCK ON DATA.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
026116  104410                                MSTCLR                    ;MASTER CLEAR KMC11
026120  005000                                CLR     R0                ;MEM + SP ADDRESS
026122  012702  026240                        MOV     #5$,R2            ;POINTER TO CORRECT DATA
026126  004737  035602                        JSR     PC,MEMLD          ;LOAD 8 WORDS OF MAIN MEMORY
026132  035726                                MEMDAT                    ;POINTER TO DATA
026134  004737  035636                        JSR     PC,SPLD           ;LOAD 8 WORDS OF SP
026140  035736                                SPDAT                     ;POINTER TO DATA
026142  004737  035702                1$:     JSR     PC,CLRC           ;CLEAR C BIT!
026146  042737  000017  026162                BIC     #17,2$            ;CLEAR ADDRESS FIELD OF INSTRUCTION
026154  050037  026162                        BIS     R0,2$             ;ADD ADDRESS TO INSTRUCTION
026160  104412                                ROMCLK                    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
026162  010000                        2$:     010000                    ;LOAD MAR
026164  042737  000017  026200                BIC     #17,3$            ;CLEAR ADDRESS OF INSTRUCTION
026172  050037  026200                        BIS     R0,3$             ;ADD ADDRESS TO INSTRUCTION
026176  104412                                ROMCLK                    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
026200  040660                        3$:     040400!<13*20>            ;BR ← A AND B
026202  104412                                ROMCLK                    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
026204  061224                                61224                     ;MOVE BR TO PORT4
026206  111205                                MOVB    (R2),R5           ;PUT "EXPECTED" IN R5
026210  116104  000004                        MOVB    4(R1),R4          ;PUT "FOUND" IN R4
026214  120504                                CMPB    R5,R4             ;DATA CORRECT?
026216  001401                                BEQ     4$                ;BR IF YES
026220  104015                                ERROR   15                ;ALU ERROR
026222  104405                        4$:     SCOP1                     ;SW09=1?
026224  005202                                INC     R2                ;NEXT DATA
026226  005200                                INC     R0                ;NEXT ADDRESS
026230  022700  000010                        CMP     #10,R0            ;DONE YET?
026234  001342                                BNE     1$                ;BR IF NO
026236  104420                                ADVANCE                   ; ADVANCE LOOP
026240     000     000     000        5$:     .BYTE   0,0,0,-1,125,0,0,252
026243     377     125     000
026246     000     252
                                      .EVEN



                                                    ;************************* TEST 75 *************************
```

N09

```
                                                ;*ALU TEST
                                                ;*TEST OF ALU FUNCTION A OR B WITH C BIT CLEARED
                                                ;*ALU FUNCTION (A OR B)     CODE=14
                                                ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                                ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                                ;;*******************************************************

                                                ;  TEST 75
                                                ;--------------

                                        ;;******************************************************
026250  000004                          TST75:  SCOPE
026252  012737  000075  001202                  MOV     #75,$TSTNM              ; LOAD THE NO. OF THIS TEST
026260  012737  026426  001442                  MOV     #TST76,NEXT             ; POINT TO THE START OF NEXT TEST.
026266  012737  026320  001444                  MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
026274  104410                                  MSTCLR                  ;MASTER CLEAR KMC11
026276  005000                                  CLR     R0              ;MEM + SP ADDRESS
026300  012702  026416                          MOV     #5$,R2          ;POINTER TO CORRECT DATA
026304  004737  035602                          JSR     PC,MEMLD        ;LOAD 8 WORDS OF MAIN MEMORY
026310  035726                                  MEMDAT                  ;POINTER TO DATA
026312  004737  035636                          JSR     PC,SPLD         ;LOAD 8 WORDS OF SP
026316  035736                                  SPDAT                   ;POINTER TO DATA
026320  004737  035702                  1$:     JSR     PC,CLRC         ;CLEAR C BIT!
026324  042737  000017  026340                  BIC     #17,2$          ;CLEAR ADDRESS FIELD OF INSTRUCTION
026332  050037  026340                          BIS     R0,2$           ;ADD ADDRESS TO INSTRUCTION
026336  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
026340  010000                          2$:     010000                  ;LOAD MAR
026342  042737  000017  026356                  BIC     #17,3$          ;CLEAR ADDRESS OF INSTRUCTION
026350  050037  026356                          BIS     R0,3$           ;ADD ADDRESS TO INSTRUCTION
026354  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
026356  040700                          3$:     040400!<14*20>          ;BR ← A OR B
026360  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
026362  061224                                  61224                   ;MOVE BR TO PORT4
026364  111205                                  MOVB    (R2),R5         ;PUT "EXPECTED" IN R5
026366  116104  000004                          MOVB    4(R1),R4        ;PUT "FOUND" IN R4
026372  120504                                  CMPB    R5,R4           ;DATA CORRECT?
026374  001401                                  BEQ     4$              ;BR IF YES
026376  104015                                  ERROR   15              ;ALU ERROR
026400  104405                          4$:     SCOP1                   ;SW09=1?
026402  005202                                  INC     R2              ;NEXT DATA
026404  005200                                  INC     R0              ;NEXT ADDRESS
026406  022700  000010                          CMP     #10,R0          ;DONE YET?
026412  001342                                  BNE     1$              ;BR IF NO
026414  104420                                  ADVANCE                 ; ADVANCE LOOP
026416     000     377     377          5$:     .BYTE   0,-1,-1,-1,125,-1,-1,252
026421     377     125     377
026424     377     252
                                        .EVEN



                                                ;*************************** TEST 76 ***************************
                                                ;*ALU TEST
                                                ;*TEST OF ALU FUNCTION A XOR B WITH C BIT CLEARED
                                                ;*ALU FUNCTION (A XOR B)    CODE=15
                                                ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                                ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
```

```
                                                    ;;*******************************************************************
                                                    
                                                    ;  TEST 76
                                                    ;--------------
                                                    
                                                    ;;*******************************************************************
 026426  000004                             TST76:  SCOPE
 026430  012737  000076  001202                     MOV     #76,$TSTNM              ; LOAD THE NO. OF THIS TEST
 026436  012737  026604  001442                     MOV     #TST77,NEXT             ; POINT TO THE START OF NEXT TEST.
 026444  012737  026476  001444                     MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
                                                                            ;R1 CONTAINS BASE KMC11 ADDRESS
 026452  104410                                     MSTCLR                  ;MASTER CLEAR KMC11
 026454  005000                                     CLR     R0              ;MEM + SP ADDRESS
 026456  012702  026574                             MOV     #5$,R2          ;POINTER TO CORRECT DATA
 026462  004737  035602                             JSR     PC,MEMLD        ;LOAD 8 WORDS OF MAIN MEMORY
 026466  035726                                     MEMDAT                  ;POINTER TO DATA
 026470  004737  035636                             JSR     PC,SPLD         ;LOAD 8 WORDS OF SP
 026474  035736                                     SPDAT                   ;POINTER TO DATA
 026476  004737  035702                     1$:     JSR     PC,CLRC         ;CLEAR C BIT!
 026502  042737  000017  026516                     BIC     #17,2$          ;CLEAR ADDRESS FIELD OF INSTRUCTION
 026510  050037  026516                             BIS     R0,2$           ;ADD ADDRESS TO INSTRUCTION
 026514  104412                                     ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 026516  010000                             2$:     010000                  ;LOAD MAR
 026520  042737  000017  026534                     BIC     #17,3$          ;CLEAR ADDRESS OF INSTRUCTION
 026526  050037  026534                             BIS     R0,3$           ;ADD ADDRESS TO INSTRUCTION
 026532  104412                                     ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 026534  040720                             3$:     040400!<15*20>          ;BR ← A XOR B
 026536  104412                                     ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 026540  061224                                     61224                   ;MOVE BR TO PORT4
 026542  111205                                     MOVB    (R2),R5         ;PUT "EXPECTED" IN R5
 026544  116104  000004                             MOVB    4(R1),R4        ;PUT "FOUND" IN R4
 026550  120504                                     CMPB    R5,R4           ;DATA CORRECT?
 026552  001401                                     BEQ     4$              ;BR IF YES
 026554  104015                                     ERROR   15              ;ALU ERROR
 026556  104405                             4$:     SCOP1                   ;SW09=1?
 026560  005202                                     INC     R2              ;NEXT DATA
 026562  005200                                     INC     R0              ;NEXT ADDRESS
 026564  022700  000010                             CMP     #10,R0          ;DONE YET?
 026570  001342                                     BNE     1$              ;BR IF NO
 026572  104420                                     ADVANCE                 ; ADVANCE LOOP
 026574     000     377     377             5$:     .BYTE   0,-1,-1,0,0,-1,-1,0
 026577     000     000     377
 026602     377     000
                                            .EVEN



                                                    ;************************** TEST 77 **************************
                                                    ;*ALU TEST
                                                    ;*TEST OF ALU FUNCTION ADD WITH C BIT CLEARED
                                                    ;*ALU FUNCTION (A PLUS B)     CODE=00
                                                    ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                                    ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                                    ;;*******************************************************************
                                                    
                                                    ;  TEST 77
                                                    ;--------------
                                                    
                                                    ;;*******************************************************************
```

```
026604  000004                    TST77:  SCOPE
026606  012737  000077  001202            MOV     #77,$TSTNM                ; LOAD THE NO. OF THIS TEST
026614  012737  026762  001442            MOV     #TST100,NEXT              ; POINT TO THE START OF NEXT TEST.
026622  012737  026654  001444            MOV     #1$,LOCK                  ; ADDRESS FOR LOCK ON DATA.
                                                                     ;R1 CONTAINS BASE KMC11 ADDRESS
026630  104410                            MSTCLR                     ;MASTER CLEAR KMC11
026632  005000                            CLR     R0                 ;MEM + SP ADDRESS
026634  012702  026752                    MOV     #5$,R2             ;POINTER TO CORRECT DATA
026640  004737  035602                    JSR     PC,MEMLD           ;LOAD 8 WORDS OF MAIN MEMORY
026644  035726                            MEMDAT                     ;POINTER TO DATA
026646  004737  035636                    JSR     PC,SPLD            ;LOAD 8 WORDS OF SP
026652  035736                            SPDAT                      ;POINTER TO DATA
026654  004737  035702            1$:     JSR     PC,CLRC            ;CLEAR C BIT!
026660  042737  000017  026674            BIC     #17,2$             ;CLEAR ADDRESS FIELD OF INSTRUCTION
026666  050037  026674                    BIS     R0,2$              ;ADD ADDRESS TO INSTRUCTION
026672  104412                            ROMCLK                     ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
026674  010000                    2$:     010000                     ;LOAD MAR
026676  042737  000017  026712            BIC     #17,3$             ;CLEAR ADDRESS OF INSTRUCTION
026704  050037  026712                    BIS     R0,3$              ;ADD ADDRESS TO INSTRUCTION
026710  104412                            ROMCLK                     ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
026712  040400                    3$:     040400!<00*20>             ;BR ← ADD
026714  104412                            ROMCLK                     ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
026716  061224                            61224                      ;MOVE BR TO PORT4
026720  111205                            MOVB    (R2),R5            ;PUT "EXPECTED" IN R5
026722  116104  000004                    MOVB    4(R1),R4           ;PUT "FOUND" IN R4
026726  120504                            CMPB    R5,R4              ;DATA CORRECT?
026730  001401                            BEQ     4$                 ;BR IF YES
026732  104015                            ERROR   15                 ;ALU ERROR
026734  104405                    4$:     SCOP1                      ;SW09=1?
026736  005202                            INC     R2                 ;NEXT DATA
026740  005200                            INC     R0                 ;NEXT ADDRESS
026742  022700  000010                    CMP     #10,R0             ;DONE YET?
026746  001342                            BNE     1$                 ;BR IF NO
026750  104420                            ADVANCE                    ; ADVANCE LOOP
026752     000     377     377    5$:     .BYTE   0,-1,-1,376,252,-1,-1,124
026755     376     252     377
026760     377     124
                                  .EVEN



                                          ;*************************** TEST 100 ***************************
                                          ;*ALU TEST
                                          ;*TEST OF ALU FUNCTION 2A W/C WITH C BIT CLEARED
                                          ;*ALU FUNCTION (A PLUS A PLUS C)     CODE=6
                                          ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                          ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                          ;;**************************************************************

                                          ;  TEST 100
                                          ;-------------

                                  ;;*************************************************************
026762  000004                    TST100: SCOPE
026764  012737  000100  001202            MOV     #100,$TSTNM               ; LOAD THE NO. OF THIS TEST
026772  012737  027140  001442            MOV     #TST101,NEXT              ; POINT TO THE START OF NEXT TEST.
027000  012737  027032  001444            MOV     #1$,LOCK                  ; ADDRESS FOR LOCK ON DATA.
                                                                     ;R1 CONTAINS BASE KMC11 ADDRESS
```

```
027006  104410                                 MSTCLR                          ;MASTER CLEAR KMC11
027010  005000                                 CLR     R0                      ;MEM + SP ADDRESS
027012  012702  027130                         MOV     #5$,R2                  ;POINTER TO CORRECT DATA
027016  004737  035602                         JSR     PC,MEMLD                ;LOAD 8 WORDS OF MAIN MEMORY
027022  035726                                 MEMDAT                          ;POINTER TO DATA
027024  004737  035636                         JSR     PC,SPLD                 ;LOAD 8 WORDS OF SP
027030  035736                                 SPDAT                           ;POINTER TO DATA
027032  004737  035702                 1$:     JSR     PC,CLRC                 ;CLEAR C BIT!
027036  042737  000017  027052                 BIC     #17,2$                  ;CLEAR ADDRESS FIELD OF INSTRUCTION
027044  050037  027052                         BIS     R0,2$                   ;ADD ADDRESS TO INSTRUCTION
027050  104412                                 ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027052  010000                         2$:     010000                          ;LOAD MAR
027054  042737  000017  027070                 BIC     #17,3$                  ;CLEAR ADDRESS OF INSTRUCTION
027062  050037  027070                         BIS     R0,3$                   ;ADD ADDRESS TO INSTRUCTION
027066  104412                                 ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027070  040540                         3$:     040400!<6*20>                   ;BR + 2A W/C
027072  104412                                 ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027074  061224                                 61224                           ;MOVE BR TO PORT4
027076  111205                                 MOVB    (R2),R5                 ;PUT "EXPECTED" IN R5
027100  116104  000004                         MOVB    4(R1),R4                ;PUT "FOUND" IN R4
027104  120504                                 CMPB    R5,R4                   ;DATA CORRECT?
027106  001401                                 BEQ     4$                      ;BR IF YES
027110  104015                                 ERROR   15                      ;ALU ERROR
027112  104405                         4$:     SCOP1                           ;SW09=1?
027114  005202                                 INC     R2                      ;NEXT DATA
027116  005200                                 INC     R0                      ;NEXT ADDRESS
027120  022700  000010                         CMP     #10,R0                  ;DONE YET?
027124  001342                                 BNE     1$                      ;BR IF NO
027126  104420                                 ADVANCE                         ; ADVANCE LOOP
027130     000     000     376         5$:     .BYTE   0,0,376,376,252,252,124,124
027133     376     252     252
027136     124     124
                                       .EVEN



                                               ;*************************** TEST 101 ***************************
                                               ;*ALU TEST
                                               ;*TEST OF ALU FUNCTION SUB WITH C BIT CLEARED
                                               ;*ALU FUNCTION (A-B)     CODE=16
                                               ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                               ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                               ;;***************************************************************

                                               ;   TEST 101
                                               ;-------------
                                       ;;*************************************************************
027140  000004                         TST101: SCOPE
027142  012737  000101  001202                 MOV     #101,$TSTNM              ; LOAD THE NO. OF THIS TEST
027150  012737  027316  001442                 MOV     #TST102,NEXT             ; POINT TO THE START OF NEXT TEST.
027156  012737  027210  001444                 MOV     #1$,LOCK                 ; ADDRESS FOR LOCK ON DATA.
                                                                       ;R1 CONTAINS BASE KMC11 ADDRESS
027164  104410                                 MSTCLR                          ;MASTER CLEAR KMC11
027166  005000                                 CLR     R0                      ;MEM + SP ADDRESS
027170  012702  027306                         MOV     #5$,R2                  ;POINTER TO CORRECT DATA
027174  004737  035602                         JSR     PC,MEMLD                ;LOAD 8 WORDS OF MAIN MEMORY
027200  035726                                 MEMDAT                          ;POINTER TO DATA
```

```
027202  004737  035636                    JSR     PC,SPLD              ;LOAD 8 WORDS OF SP
027206  035736                            SPDAT                        ;POINTER TO DATA
027210  004737  035702            1$:     JSR     PC,CLRC              ;CLEAR C BIT!
027214  042737  000017  027230            BIC     #17,2$               ;CLEAR ADDRESS FIELD OF INSTRUCTION
027222  050037  027230                    BIS     R0,2$                ;ADD ADDRESS TO INSTRUCTION
027226  104412                            ROMCLK                       ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027230  010000                    2$:     010000                       ;LOAD MAR
027232  042737  000017  027246            BIC     #17,3$               ;CLEAR ADDRESS OF INSTRUCTION
027240  050037  027246                    BIS     R0,3$                ;ADD ADDRESS TO INSTRUCTION
027244  104412                            ROMCLK                       ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027246  040740                    3$:     040400!<16*20>               ;BR ← SUB
027250  104412                            ROMCLK                       ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027252  061224                            61224                        ;MOVE BR TO PORT4
027254  111205                            MOVB    (R2),R5              ;PUT "EXPECTED" IN R5
027256  116104  000004                    MOVB    4(R1),R4             ;PUT "FOUND" IN R4
027262  120504                            CMPB    R5,R4                ;DATA CORRECT?
027264  001401                            BEQ     4$                   ;BR IF YES
027266  104015                            ERROR   15                   ;ALU ERROR
027270  104405                    4$:     SCOP1                        ;SW09=1?
027272  005202                            INC     R2                   ;NEXT DATA
027274  005200                            INC     R0                   ;NEXT ADDRESS
027276  022700  000010                    CMP     #10,R0               ;DONE YET?
027302  001342                            BNE     1$                   ;BR IF NO
027304  104420                            ADVANCE                      ; ADVANCE LOOP
027306     000     001     377    5$:     .BYTE   0,1,-1,0,0,253,125,0
027311     000     000     253
027314     125     000
                                  .EVEN



                                          ;*************************** TEST 102 ***************************
                                          ;*ALU TEST
                                          ;*TEST OF ALU FUNCTION ADD W/C WITH C BIT CLEARED
                                          ;*ALU FUNCTION (A PLUS B PLUS C)     CODE=01
                                          ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                          ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                          ;*****************************************************************

                                          ;  TEST 102
                                          ;-------------
                                  ;;*****************************************************************
027316  000004                    TST102: SCOPE
027320  012737  000102  001202            MOV     #102,$TSTNM                ; LOAD THE NO. OF THIS TEST
027326  012737  027474  001442            MOV     #TST103,NEXT               ; POINT TO THE START OF NEXT TEST.
027334  012737  027366  001444            MOV     #1$,LOCK                   ; ADDRESS FOR LOCK ON DATA.
                                                                       ;R1 CONTAINS BASE KMC11 ADDRESS
027342  104410                            MSTCLR                       ;MASTER CLEAR KMC11
027344  005000                            CLR     R0                   ;MEM + SP ADDRESS
027346  012702  027464                    MOV     #5$,R2               ;POINTER TO CORRECT DATA
027352  004737  035602                    JSR     PC,MEMLD             ;LOAD 8 WORDS OF MAIN MEMORY
027356  035726                            MEMDAT                       ;POINTER TO DATA
027360  004737  035636                    JSR     PC,SPLD              ;LOAD 8 WORDS OF SP
027364  035736                            SPDAT                        ;POINTER TO DATA
027366  004737  035702            1$:     JSR     PC,CLRC              ;CLEAR C BIT!
027372  042737  000017  027406            BIC     #17,2$               ;CLEAR ADDRESS FIELD OF INSTRUCTION
027400  050037  027406                    BIS     R0,2$                ;ADD ADDRESS TO INSTRUCTION
```

```
027404  104412                           ROMCLK                   ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027406  010000                   2$:     010000                   ;LOAD MAR
027410  042737  000017  027424           BIC     #17,3$           ;CLEAR ADDRESS OF INSTRUCTION
027416  050037  027424                   BIS     R0,3$            ;ADD ADDRESS TO INSTRUCTION
027422  104412                           ROMCLK                   ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027424  040420                   3$:     040400!<01*20>           ;BR ← ADD W/C
027426  104412                           ROMCLK                   ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027430  061224                           61224                    ;MOVE BR TO PORT4
027432  111205                           MOVB    (R2),R5          ;PUT "EXPECTED" IN R5
027434  116104  000004                   MOVB    4(R1),R4         ;PUT "FOUND" IN R4
027440  120504                           CMPB    R5,R4            ;DATA CORRECT?
027442  001401                           BEQ     4$               ;BR IF YES
027444  104015                           ERROR   15               ;ALU ERROR
027446  104405                   4$:     SCOP1                    ;SW09=1?
027450  005202                           INC     R2               ;NEXT DATA
027452  005200                           INC     R0               ;NEXT ADDRESS
027454  022700  000010                   CMP     #10,R0           ;DONE YET?
027460  001342                           BNE     1$               ;BR IF NO
027462  104420                           ADVANCE                  ; ADVANCE LOOP
027464     000     377     377   5$:     .BYTE   0,-1,-1,376,252,-1,-1,124
027467     376     252     377
027472     377     124
                                 .EVEN


                                         ;*************************** TEST 103 ***************************
                                         ;*ALU TEST
                                         ;*TEST OF ALU FUNCTION SUB W/C WITH C BIT CLEARED
                                         ;*ALU FUNCTION (A-B-C)     CODE=2
                                         ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                         ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                         ;:*****************************************************************

                                         ;  TEST 103
                                         ;--------------
                                 ;;*****************************************************************
027474  000004                   TST103: SCOPE
027476  012737  000103  001202           MOV     #103,$TSTNM              ; LOAD THE NO. OF THIS TEST
027504  012737  027652  001442           MOV     #TST104,NEXT             ; POINT TO THE START OF NEXT TEST.
027512  012737  027544  001444           MOV     #1$,LOCK                 ; ADDRESS FOR LOCK ON DATA.
                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
027520  104410                           MSTCLR                   ;MASTER CLEAR KMC11
027522  005000                           CLR     R0               ;MEM + SP ADDRESS
027524  012702  027642                   MOV     #5$,R2           ;POINTER TO CORRECT DATA
027530  004737  035602                   JSR     PC,MEMLD         ;LOAD 8 WORDS OF MAIN MEMORY
027534  035726                           MEMDAT                   ;POINTER TO DATA
027536  004737  035636                   JSR     PC,SPLD          ;LOAD 8 WORDS OF SP
027542  035736                           SPDAT                    ;POINTER TO DATA
027544  004737  035702           1$:     JSR     PC,CLRC          ;CLEAR C BIT!
027550  042737  000017  027564           BIC     #17,2$           ;CLEAR ADDRESS FIELD OF INSTRUCTION
027556  050037  027564                   BIS     R0,2$            ;ADD ADDRESS TO INSTRUCTION
027562  104412                           ROMCLK                   ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027564  010000                   2$:     010000                   ;LOAD MAR
027566  042737  000017  027602           BIC     #17,3$           ;CLEAR ADDRESS OF INSTRUCTION
027574  050037  027602                   BIS     R0,3$            ;ADD ADDRESS TO INSTRUCTION
027600  104412                           ROMCLK                   ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
```

```
027602  040440                       3$:     040400!<2*20>              ;BR + SUB W/C
027604  104412                               ROMCLK                     ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027606  061224                               61224                      ;MOVE BR TO PORT4
027610  111205                               MOVB    (R2),R5            ;PUT "EXPECTED" IN R5
027612  116104  000004                       MOVB    4(R1),R4           ;PUT "FOUND" IN R4
027616  120504                               CMPB    R5,R4              ;DATA CORRECT?
027620  001401                               BEQ     4$                 ;BR IF YES
027622  104015                               ERROR   15                 ;ALU ERROR
027624  104405                       4$:     SCOP1                      ;SW09=1?
027626  005202                               INC     R2                 ;NEXT DATA
027630  005200                               INC     R0                 ;NEXT ADDRESS
027632  022700  000010                       CMP     #10,R0             ;DONE YET?
027636  001342                               BNE     1$                 ;BR IF NO
027640  104420                               ADVANCE                    ; ADVANCE LOOP
027642     377     000     376       5$:     .BYTE   -1,0,376,-1,-1,252,124,-1
027645     377     377     252
027650     124     377
                                     .EVEN



                                             ;************************** TEST 104 **************************
                                             ;*ALU TEST
                                             ;*TEST OF ALU FUNCTION INC A WITH C BIT CLEARED
                                             ;*ALU FUNCTION (A PLUS 1)    CODE=3
                                             ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                             ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                             ;:**************************************************************

                                             ;  TEST 104
                                             ;______________

                                     ;;**************************************************************
027652  000004                       TST104: SCOPE
027654  012737  000104  001202               MOV     #104,$TSTNM                  ; LOAD THE NO. OF THIS TEST
027662  012737  030030  001442               MOV     #TST105,NEXT                 ; POINT TO THE START OF NEXT TEST.
027670  012737  027722  001444               MOV     #1$,LOCK                     ; ADDRESS FOR LOCK ON DATA.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
027676  104410                               MSTCLR                     ;MASTER CLEAR KMC11
027700  005000                               CLR     R0                 ;MEM + SP ADDRESS
027702  012702  030020                       MOV     #5$,R2             ;POINTER TO CORRECT DATA
027706  004737  035602                       JSR     PC,MEMLD           ;LOAD 8 WORDS OF MAIN MEMORY
027712  035726                               MEMDAT                     ;POINTER TO DATA
027714  004737  035636                       JSR     PC,SPLD            ;LOAD 8 WORDS OF SP
027720  035736                               SPDAT                      ;POINTER TO DATA
027722  004737  035702               1$:     JSR     PC,CLRC            ;CLEAR C BIT!
027726  042737  000017  027742               BIC     #17,2$             ;CLEAR ADDRESS FIELD OF INSTRUCTION
027734  050037  027742                       BIS     R0,2$              ;ADD ADDRESS TO INSTRUCTION
027740  104412                               ROMCLK                     ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027742  010000                       2$:     010000                     ;LOAD MAR
027744  042737  000017  027760               BIC     #17,3$             ;CLEAR ADDRESS OF INSTRUCTION
027752  050037  027760                       BIS     R0,3$              ;ADD ADDRESS TO INSTRUCTION
027756  104412                               ROMCLK                     ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027760  040460                       3$:     040400!<3*20>              ;BR + INC A
027762  104412                               ROMCLK                     ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
027764  061224                               61224                      ;MOVE BR TO PORT4
027766  111205                               MOVB    (R2),R5            ;PUT "EXPECTED" IN R5
027770  116104  000004                       MOVB    4(R1),R4           ;PUT "FOUND" IN R4
```

```
027774  120504                                   CMPB    R5,R4                   ;DATA CORRECT?
027776  001401                                   BEQ     4$                      ;BR IF YES
030000  104015                                   ERROR   15                      ;ALU ERROR
030002  104405                          4$:      SCOP1                           ;SW09=1?
030004  005202                                   INC     R2                      ;NEXT DATA
030006  005200                                   INC     R0                      ;NEXT ADDRESS
030010  022700  000010                           CMP     #10,R0                  ;DONE YET?
030014  001342                                   BNE     1$                      ;BR IF NO
030016  104420                                   ADVANCE                         ; ADVANCE LOOP
030020     001     001     000          5$:      .BYTE   1,1,0,0,126,126,253,253
030023     000     126     126
030026     253     253
                                .EVEN



                                         ;************************** TEST 105 **************************
                                         ;*ALU TEST
                                         ;*TEST OF ALU FUNCTION 2A WITH C BIT CLEARED
                                         ;*ALU FUNCTION (A PLUS A)     CODE=5
                                         ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                         ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                         ;:**************************************************************

                                         ;  TEST 105
                                         ;_______________

                                ;;**********************************************************************
030030  000004                  TST105:  SCOPE
030032  012737  000105  001202           MOV     #105,$TSTNM             ; LOAD THE NO. OF THIS TEST
030040  012737  030206  001442           MOV     #TST106,NEXT            ; POINT TO THE START OF NEXT TEST.
030046  012737  030100  001444           MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
030054  104410                           MSTCLR                          ;MASTER CLEAR KMC11
030056  005000                           CLR     R0                      ;MEM + SP ADDRESS
030060  012702  030176                   MOV     #5$,R2                  ;POINTER TO CORRECT DATA
030064  004737  035602                   JSR     PC,MEMLD                ;LOAD 8 WORDS OF MAIN MEMORY
030070  035726                           MEMDAT                          ;POINTER TO DATA
030072  004737  035636                   JSR     PC,SPLD                 ;LOAD 8 WORDS OF SP
030076  035736                           SPDAT                           ;POINTER TO DATA
030100  004737  035702          1$:      JSR     PC,CLRC                 ;CLEAR C BIT!
030104  042737  000017  030120           BIC     #17,2$                  ;CLEAR ADDRESS FIELD OF INSTRUCTION
030112  050037  030120                   BIS     R0,2$                   ;ADD ADDRESS TO INSTRUCTION
030116  104412                           ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030120  010000                  2$:      010000                          ;LOAD MAR
030122  042737  000017  030136           BIC     #17,3$                  ;CLEAR ADDRESS OF INSTRUCTION
030130  050037  030136                   BIS     R0,3$                   ;ADD ADDRESS TO INSTRUCTION
030134  104412                           ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030136  040520                  3$:      040400!<5*20>                   ;BR ← 2A
030140  104412                           ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030142  061224                           61224                           ;MOVE BR TO PORT4
030144  111205                           MOVB    (R2),R5                 ;PUT "EXPECTED" IN R5
030146  116104  000004                   MOVB    4(R1),R4                ;PUT "FOUND" IN R4
030152  120504                           CMPB    R5,R4                   ;DATA CORRECT?
030154  001401                           BEQ     4$                      ;BR IF YES
030156  104015                           ERROR   15                      ;ALU ERROR
030160  104405                  4$:      SCOP1                           ;SW09=1?
030162  005202                           INC     R2                      ;NEXT DATA
```

```
030164  005200                                INC     R0                      ;NEXT ADDRESS
030166  022700  000010                        CMP     #10,R0                  ;DONE YET?
030172  001342                                BNE     1$                      ;BR IF NO
030174  104420                                ADVANCE                         ; ADVANCE LOOP
030176     000     000     376  5$:           .BYTE   0,0,376,376,252,252,124,124
030201     376     252     252
030204     124     124
                                .EVEN



                                              ;************************** TEST 106 **************************
                                              ;*ALU TEST
                                              ;*TEST OF ALU FUNCTION A PLUS C WITH C BIT CLEARED
                                              ;*ALU FUNCTION (A PLUS C)    CODE=4
                                              ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                              ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                              ;:*************************************************************

                                              ;  TEST 106
                                              ;-------------

                                ;:*******************************************************************
030206  000004                  TST106: SCOPE
030210  012737  000106  001202                MOV     #106,$TSTNM                 ; LOAD THE NO. OF THIS TEST
030216  012737  030364  001442                MOV     #TST107,NEXT                ; POINT TO THE START OF NEXT TEST.
030224  012737  030256  001444                MOV     #1$,LOCK                    ; ADDRESS FOR LOCK ON DATA.
                                                                      ;R1 CONTAINS BASE KMC11 ADDRESS
030232  104410                                MSTCLR                  ;MASTER CLEAR KMC11
030234  005000                                CLR     R0              ;MEM + SP ADDRESS
030236  012702  030354                        MOV     #5$,R2          ;POINTER TO CORRECT DATA
030242  004737  035602                        JSR     PC,MEMLD        ;LOAD 8 WORDS OF MAIN MEMORY
030246  035726                                MEMDAT                  ;POINTER TO DATA
030250  004737  035636                        JSR     PC,SPLD         ;LOAD 8 WORDS OF SP
030254  035736                                SPDAT                   ;POINTER TO DATA
030256  004737  035702          1$:           JSR     PC,CLRC         ;CLEAR C BIT!
030262  042737  000017  030276                BIC     #17,2$          ;CLEAR ADDRESS FIELD OF INSTRUCTION
030270  050037  030276                        BIS     R0,2$           ;ADD ADDRESS TO INSTRUCTION
030274  104412                                ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030276  010000                  2$:           010000                  ;LOAD MAR
030300  042737  000017  030314                BIC     #17,3$          ;CLEAR ADDRESS OF INSTRUCTION
030306  050037  030314                        BIS     R0,3$           ;ADD ADDRESS TO INSTRUCTION
030312  104412                                ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030314  040500                  3$:           040400!<4*20>           ;BR ← A PLUS C
030316  104412                                ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030320  061224                                61224                   ;MOVE BR TO PORT4
030322  111205                                MOVB    (R2),R5         ;PUT "EXPECTED" IN R5
030324  116104  000004                        MOVB    4(R1),R4        ;PUT "FOUND" IN R4
030330  120504                                CMPB    R5,R4           ;DATA CORRECT?
030332  001401                                BEQ     4$              ;BR IF YES
030334  104015                                ERROR   15              ;ALU ERROR
030336  104405                  4$:           SCOPI                   ;SW09=1?
030340  005202                                INC     R2              ;NEXT DATA
030342  005200                                INC     R0              ;NEXT ADDRESS
030344  022700  000010                        CMP     #10,R0          ;DONE YET?
030350  001342                                BNE     1$              ;BR IF NO
030352  104420                                ADVANCE                 ; ADVANCE LOOP
030354     000     000     377  5$:           .BYTE   0,0,-1,-1,125,125,252,252
```

```
030357     377      125      125
030362     252      252
                                     .EVEN


                                              ;************************** TEST 107 **************************
                                              ;*ALU TEST
                                              ;*TEST OF ALU FUNCTION 2'S COMP SUB WITH C BIT CLEARED
                                              ;*ALU FUNCTION (A-B-1)     CODE=17
                                              ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                              ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                              ;:*************************************************************

                                              ;  TEST 107
                                              ;--------------
                                     ;:*************************************************************
030364  000004                       TST107: SCOPE
030366  012737  000107  001202               MOV     #107,$TSTNM              ; LOAD THE NO. OF THIS TEST
030374  012737  030542  001442               MOV     #TST110,NEXT             ; POINT TO THE START OF NEXT TEST.
030402  012737  030434  001444               MOV     #1$,LOCK                 ; ADDRESS FOR LOCK ON DATA.
                                                                              ;R1 CONTAINS BASE KMC11 ADDRESS
030410  104410                               MSTCLR                           ;MASTER CLEAR KMC11
030412  005000                               CLR     R0                       ;MEM + SP ADDRESS
030414  012702  030532                       MOV     #5$,R2                   ;POINTER TO CORRECT DATA
030420  004737  035602                       JSR     PC,MEMLD                 ;LOAD 8 WORDS OF MAIN MEMORY
030424  035726                               MEMDAT                           ;POINTER TO DATA
030426  004737  035636                       JSR     PC,SPLD                  ;LOAD 8 WORDS OF SP
030432  035736                               SPDAT                            ;POINTER TO DATA
030434  004737  035702               1$:     JSR     PC,CLRC                  ;CLEAR C BIT!
030440  042737  000017  030454               BIC     #17,2$                   ;CLEAR ADDRESS FIELD OF INSTRUCTION
030446  050037  030454                       BIS     R0,2$                    ;ADD ADDRESS TO INSTRUCTION
030452  104412                               ROMCLK                           ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030454  010000                       2$:     010000                           ;LOAD MAR
030456  042737  000017  030472               BIC     #17,3$                   ;CLEAR ADDRESS OF INSTRUCTION
030464  050037  030472                       BIS     R0,3$                    ;ADD ADDRESS TO INSTRUCTION
030470  104412                               ROMCLK                           ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030472  040760                       3$:     040400!<17*20>                   ;BR ← 2'S COMP SUB
030474  104412                               ROMCLK                           ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030476  061224                               61224                            ;MOVE BR TO PORT4
030500  111205                               MOVB    (R2),R5                  ;PUT "EXPECTED" IN R5
030502  116104  000004                       MOVB    4(R1),R4                 ;PUT "FOUND" IN R4
030506  120504                               CMPB    R5,R4                    ;DATA CORRECT?
030510  001401                               BEQ     4$                       ;BR IF YES
030512  104015                               ERROR   15                       ;ALU ERROR
030514  104405                       4$:     SCOP1                            ;SW09=1?
030516  005202                               INC     R2                       ;NEXT DATA
030520  005200                               INC     R0                       ;NEXT ADDRESS
030522  022700  000010                       CMP     #10,R0                   ;DONE YET?
030526  001342                               BNE     1$                       ;BR IF NO
030530  104420                               ADVANCE                          ; ADVANCE LOOP
030532     377      000      376     5$:     .BYTE   -1,0,376,-1,-1,252,124,-1
030535     377      377      252
030540     124      377
                                     .EVEN
```

```
                                                         ;************************** TEST 110 *************************
                                                         ;*ALU TEST
                                                         ;*TEST OF ALU FUNCTION DEC A WITH C BIT CLEARED
                                                         ;*ALU FUNCTION (A-1)    CODE=7
                                                         ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                                         ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                                         ;:*************************************************************

                                                         ;  TEST 110
                                                         ;--------------
                                                 ;;*************************************************************
030542  000004                                   TST110: SCOPE
030544  012737  000110  001202                           MOV     #110,$TSTNM                     ; LOAD THE NO. OF THIS TEST
030552  012737  030720  001442                           MOV     #TST111,NEXT                    ; POINT TO THE START OF NEXT TEST.
030560  012737  030612  001444                           MOV     #1$,LOCK                        ; ADDRESS FOR LOCK ON DATA.
                                                                                                ;R1 CONTAINS BASE KMC11 ADDRESS
030566  104410                                           MSTCLR                                 ;MASTER CLEAR KMC11
030570  005000                                           CLR     R0                             ;MEM + SP ADDRESS
030572  012702  030710                                   MOV     #5$,R2                         ;POINTER TO CORRECT DATA
030576  004737  035602                                   JSR     PC,MEMLD                       ;LOAD 8 WORDS OF MAIN MEMORY
030602  035726                                           MEMDAT                                 ;POINTER TO DATA
030604  004737  035636                                   JSR     PC,SPLD                        ;LOAD 8 WORDS OF SP
030610  035736                                           SPDAT                                  ;POINTER TO DATA
030612  004737  035702                           1$:     JSR     PC,CLRC                        ;CLEAR C BIT!
030616  042737  000017  030632                           BIC     #17,2$                         ;CLEAR ADDRESS FIELD OF INSTRUCTION
030624  050037  030632                                   BIS     R0,2$                          ;ADD ADDRESS TO INSTRUCTION
030630  104412                                           ROMCLK                                 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030632  010000                                   2$:     010000                                 ;LOAD MAR
030634  042737  000017  030650                           BIC     #17,3$                         ;CLEAR ADDRESS OF INSTRUCTION
030642  050037  030650                                   BIS     R0,3$                          ;ADD ADDRESS TO INSTRUCTION
030646  104412                                           ROMCLK                                 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030650  040560                                   3$:     040400!<7*20>                          ;BR + DEC A
030652  104412                                           ROMCLK                                 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030654  061224                                           61224                                  ;MOVE BR TO PORT4
030656  111205                                           MOVB    (R2),R5                        ;PUT "EXPECTED" IN R5
030660  116104  000004                                   MOVB    4(R1),R4                       ;PUT "FOUND" IN R4
030664  120504                                           CMPB    R5,R4                          ;DATA CORRECT?
030666  001401                                           BEQ     4$                             ;BR IF YES
030670  104015                                           ERROR   15                             ;ALU ERROR
030672  104405                                   4$:     SCOP1                                  ;SW09=1?
030674  005202                                           INC     R2                             ;NEXT DATA
030676  005200                                           INC     R0                             ;NEXT ADDRESS
030700  022700  000010                                   CMP     #10,R0                         ;DONE YET?
030704  001342                                           BNE     1$                             ;BR IF NO
030706  104420                                           ADVANCE                                ; ADVANCE LOOP
030710     377     377     376                   5$:     .BYTE   -1,-1,376,376,124,124,251,251
030713     376     124     124
030716     251     251
                                                 .EVEN



                                                         ;************************** TEST 111 *************************
                                                         ;*ALU TEST
                                                         ;*TEST OF ALU FUNCTION SEL B WITH C BIT SET
                                                         ;*ALU FUNCTION (B)    CODE=11
                                                         ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
```

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                                                  ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                                  ;;*************************************************************

                                                  ;  TEST 111
                                                  ;--------------

                                          ;;*************************************************************
030720  000004                            TST111: SCOPE
030722  012737  000111  001202                    MOV     #111,$TSTNM            ; LOAD THE NO. OF THIS TEST
030730  012737  031076  001442                    MOV     #TST112,NEXT           ; POINT TO THE START OF NEXT TEST.
030736  012737  030770  001444                    MOV     #1$,LOCK               ; ADDRESS FOR LOCK ON DATA.
                                                                         ;R1 CONTAINS BASE KMC11 ADDRESS
030744  104410                                    MSTCLR                 ;MASTER CLEAR KMC11
030746  005000                                    CLR     R0             ;MEM + SP ADDRESS
030750  012702  031066                            MOV     #5$,R2         ;POINTER TO CORRECT DATA
030754  004737  035602                            JSR     PC,MEMLD       ;LOAD 8 WORDS OF MAIN MEMORY
030760  035726                                    MEMDAT                 ;POINTER TO DATA
030762  004737  035636                            JSR     PC,SPLD        ;LOAD 8 WORDS OF SP
030766  035736                                    SPDAT                  ;POINTER TO DATA
030770  004737  035714                    1$:     JSR     PC,SETC        ;SET C BIT!
030774  042737  000017  031010                    BIC     #17,2$         ;CLEAR ADDRESS FIELD OF INSTRUCTION
031002  050037  031010                            BIS     R0,2$          ;ADD ADDRESS TO INSTRUCTION
031006  104412                                    ROMCLK                 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031010  010000                            2$:     010000                 ;LOAD MAR
031012  042737  000017  031026                    BIC     #17,3$         ;CLEAR ADDRESS OF INSTRUCTION
031020  050037  031026                            BIS     R0,3$          ;ADD ADDRESS TO INSTRUCTION
031024  104412                                    ROMCLK                 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031026  040620                            3$:     040400!<11*20>         ;BR ← SEL B
031030  104412                                    ROMCLK                 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031032  061224                                    61224                  ;MOVE BR TO PORT4
031034  111205                                    MOVB    (R2),R5        ;PUT "EXPECTED" IN R5
031036  116104  000004                            MOVB    4(R1),R4       ;PUT "FOUND" IN R4
031042  120504                                    CMPB    R5,R4          ;DATA CORRECT?
031044  001401                                    BEQ     4$             ;BR IF YES
031046  104015                                    ERROR   15             ;ALU ERROR
031050  104405                            4$:     SCOP1                  ;SW09=1?
031052  005202                                    INC     R2             ;NEXT DATA
031054  005200                                    INC     R0             ;NEXT ADDRESS
031056  022700  000010                            CMP     #10,R0         ;DONE YET?
031062  001342                                    BNE     1$             ;BR IF NO
031064  104420                                    ADVANCE                ; ADVANCE LOOP
031066     000     377     000            5$:     .BYTE   0,-1,0,-1,125,252,125,252
031071     377     125     252
031074     125     252
                                          .EVEN


                                                  ;************************* TEST 112 *************************
                                                  ;*ALU TEST
                                                  ;*TEST OF ALU FUNCTION SEL A WITH C BIT SET
                                                  ;*ALU FUNCTION (A)     CODE=10
                                                  ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                                  ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                                  ;;*************************************************************

                                                  ;  TEST 112
                                                  ;--------------
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                                        ;;*****************************************************************
031076  000004                          TST112: SCOPE
031100  012737  000112  001202                  MOV     #112,$TSTNM             ; LOAD THE NO. OF THIS TEST
031106  012737  031254  001442                  MOV     #TST113,NEXT            ; POINT TO THE START OF NEXT TEST.
031114  012737  031146  001444                  MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
031122  104410                                  MSTCLR                  ;MASTER CLEAR KMC11
031124  005000                                  CLR     R0              ;MEM + SP ADDRESS
031126  012702  031244                          MOV     #5$,R2          ;POINTER TO CORRECT DATA
031132  004737  035602                          JSR     PC,MEMLD        ;LOAD 8 WORDS OF MAIN MEMORY
031136  035726                                  MEMDAT                  ;POINTER TO DATA
031140  004737  035636                          JSR     PC,SPLD         ;LOAD 8 WORDS OF SP
031144  035736                                  SPDAT                   ;POINTER TO DATA
031146  004737  035714                  1$:     JSR     PC,SETC         ;SET C BIT!
031152  042737  000017  031166                  BIC     #17,2$          ;CLEAR ADDRESS FIELD OF INSTRUCTION
031160  050037  031166                          BIS     R0,2$           ;ADD ADDRESS TO INSTRUCTION
031164  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031166  010000                          2$:     010000                  ;LOAD MAR
031170  042737  000017  031204                  BIC     #17,3$          ;CLEAR ADDRESS OF INSTRUCTION
031176  050037  031204                          BIS     R0,3$           ;ADD ADDRESS TO INSTRUCTION
031202  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031204  040600                          3$:     040400!<10*20>          ;BR ← SEL A
031206  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031210  061224                                  61224                   ;MOVE BR TO PORT4
031212  111205                                  MOVB    (R2),R5         ;PUT "EXPECTED" IN R5
031214  116104  000004                          MOVB    4(R1),R4        ;PUT "FOUND" IN R4
031220  120504                                  CMPB    R5,R4           ;DATA CORRECT?
031222  001401                                  BEQ     4$              ;BR IF YES
031224  104015                                  ERROR   15              ;ALU ERROR
031226  104405                          4$:     SCOP1                   ;SW09=1?
031230  005202                                  INC     R2              ;NEXT DATA
031232  005200                                  INC     R0              ;NEXT ADDRESS
031234  022700  000010                          CMP     #10,R0          ;DONE YET?
031240  001342                                  BNE     1$              ;BR IF NO
031242  104420                                  ADVANCE                 ; ADVANCE LOOP
031244     000     000     377          5$:     .BYTE   0,0,-1,-1,125,125,252,252
031247     377     125     125
031252     252     252
                                        .EVEN


                                                ;*************************** TEST 113 ***************************
                                                ;*ALU TEST
                                                ;*TEST OF ALU FUNCTION A OR NOTB WITH C BIT SET
                                                ;*ALU FUNCTION (A OR NOTB)     CODE=12
                                                ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                                ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                                ;:*****************************************************************

                                                ;  TEST 113
                                                ;--------------
                                        ;;*****************************************************************
031254  000004                          TST113: SCOPE
031256  012737  000113  001202                  MOV     #113,$TSTNM             ; LOAD THE NO. OF THIS TEST
031264  012737  031432  001442                  MOV     #TST114,NEXT            ; POINT TO THE START OF NEXT TEST.
031272  012737  031324  001444                  MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
```

```
                                                                ;R1 CONTAINS BASE KMC11 ADDRESS
031300  104410                          MSTCLR                  ;MASTER CLEAR KMC11
031302  005000                          CLR     R0              ;MEM + SP ADDRESS
031304  012702  031422                  MOV     #5$,R2          ;POINTER TO CORRECT DATA
031310  004737  035602                  JSR     PC,MEMLD        ;LOAD 8 WORDS OF MAIN MEMORY
031314  035726                          MEMDAT                  ;POINTER TO DATA
031316  004737  035636                  JSR     PC,SPLD         ;LOAD 8 WORDS OF SP
031322  035736                          SPDAT                   ;POINTER TO DATA
031324  004737  035714          1$:     JSR     PC,SETC         ;SET C BIT!
031330  042737  000017  031344          BIC     #17,2$          ;CLEAR ADDRESS FIELD OF INSTRUCTION
031336  050037  031344                  BIS     R0,2$           ;ADD ADDRESS TO INSTRUCTION
031342  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031344  010000                  2$:     010000                  ;LOAD MAR
031346  042737  000017  031362          BIC     #17,3$          ;CLEAR ADDRESS OF INSTRUCTION
031354  050037  031362                  BIS     R0,3$           ;ADD ADDRESS TO INSTRUCTION
031360  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031362  040640                  3$:     040400!<12*20>          ;BR ← A OR NOTB
031364  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031366  061224                          61224                   ;MOVE BR TO PORT4
031370  111205                          MOVB    (R2),R5         ;PUT "EXPECTED" IN R5
031372  116104  000004                  MOVB    4(R1),R4        ;PUT "FOUND" IN R4
031376  120504                          CMPB    R5,R4           ;DATA CORRECT?
031400  001401                          BEQ     4$              ;BR IF YES
031402  104015                          ERROR   15              ;ALU ERROR
031404  104405                  4$:     SCOP1                   ;SW09=1?
031406  005202                          INC     R2              ;NEXT DATA
031410  005200                          INC     R0              ;NEXT ADDRESS
031412  022700  000010                  CMP     #10,R0          ;DONE YET?
031416  001342                          BNE     1$              ;BR IF NO
031420  104420                          ADVANCE                 ; ADVANCE LOOP
031422     377     000     377  5$:     .BYTE   -1,0,-1,-1,-1,125,252,-1
031425     377     377     125
031430     252     377
                                .EVEN


                                        ;*************************** TEST 114 ***************************
                                        ;*ALU TEST
                                        ;*TEST OF ALU FUNCTION A AND B WITH C BIT SET
                                        ;*ALU FUNCTION (A AND B)     CODE=13
                                        ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                        ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                        ;:***************************************************************

                                        ;  TEST 114
                                        ;--------------

                                ;:***************************************************************
031432  000004                  TST114: SCOPE
031434  012737  000114  001202          MOV     #114,$TSTNM             ; LOAD THE NO. OF THIS TEST
031442  012737  031610  001442          MOV     #TST115,NEXT            ; POINT TO THE START OF NEXT TEST.
031450  012737  031502  001444          MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
                                                                ;R1 CONTAINS BASE KMC11 ADDRESS
031456  104410                          MSTCLR                  ;MASTER CLEAR KMC11
031460  005000                          CLR     R0              ;MEM + SP ADDRESS
031462  012702  031600                  MOV     #5$,R2          ;POINTER TO CORRECT DATA
031466  004737  035602                  JSR     PC,MEMLD        ;LOAD 8 WORDS OF MAIN MEMORY
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031472  035726                            MEMDAT                      ;POINTER TO DATA
031474  004737  035636                    JSR      PC,SPLD            ;LOAD 8 WORDS OF SP
031500  035736                            SPDAT                       ;POINTER TO DATA
031502  004737  035714          1$:       JSR      PC,SETC            ;SET C BIT!
031506  042737  000017  031522            BIC      #17,2$             ;CLEAR ADDRESS FIELD OF INSTRUCTION
031514  050037  031522                    BIS      R0,2$              ;ADD ADDRESS TO INSTRUCTION
031520  104412                            ROMCLK                      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031522  010000                  2$:       010000                      ;LOAD MAR
031524  042737  000017  031540            BIC      #17,3$             ;CLEAR ADDRESS OF INSTRUCTION
031532  050037  031540                    BIS      R0,3$              ;ADD ADDRESS TO INSTRUCTION
031536  104412                            ROMCLK                      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031540  040660                  3$:       040400!<13*20>              ;BR ← A AND B
031542  104412                            ROMCLK                      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031544  061224                            61224                       ;MOVE BR TO PORT4
031546  111205                            MOVB     (R2),R5            ;PUT "EXPECTED" IN R5
031550  116104  000004                    MOVB     4(R1),R4           ;PUT "FOUND" IN R4
031554  120504                            CMPB     R5,R4              ;DATA CORRECT?
031556  001401                            BEQ      4$                 ;BR IF YES
031560  104015                            ERROR    15                 ;ALU ERROR
031562  104405                  4$:       SCOPI                       ;SW09=1?
031564  005202                            INC      R2                 ;NEXT DATA
031566  005200                            INC      R0                 ;NEXT ADDRESS
031570  022700  000010                    CMP      #10,R0             ;DONE YET?
031574  001342                            BNE      1$                 ;BR IF NO
031576  104420                            ADVANCE                     ; ADVANCE LOOP
031600     000     000     000  5$:       .BYTE    0,0,0,-1,125,0,0,252
031603     377     125     000
031606     000     252
                                .EVEN



                                          ;************************* TEST 115 **************************
                                          ;*ALU TEST
                                          ;*TEST OF ALU FUNCTION A OR B WITH C BIT SET
                                          ;*ALU FUNCTION (A OR B)    CODE=14
                                          ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                          ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                          ;;************************************************************

                                          ;  TEST 115
                                          ;--------------

                                ;;***********************************************************
031610  000004                  TST115: SCOPE
031612  012737  000115  001202            MOV      #115,$TSTNM              ; LOAD THE NO. OF THIS TEST
031620  012737  031766  001442            MOV      #TST116,NEXT             ; POINT TO THE START OF NEXT TEST.
031626  012737  031660  001444            MOV      #1$,LOCK                 ; ADDRESS FOR LOCK ON DATA.
                                                                      ;R1 CONTAINS BASE KMC11 ADDRESS
031634  104410                            MSTCLR                      ;MASTER CLEAR KMC11
031636  005000                            CLR      R0                 ;MEM + SP ADDRESS
031640  012702  031756                    MOV      #5$,R2             ;POINTER TO CORRECT DATA
031644  004737  035602                    JSR      PC,MEMLD           ;LOAD 8 WORDS OF MAIN MEMORY
031650  035726                            MEMDAT                      ;POINTER TO DATA
031652  004737  035636                    JSR      PC,SPLD            ;LOAD 8 WORDS OF SP
031656  035736                            SPDAT                       ;POINTER TO DATA
031660  004737  035714          1$:       JSR      PC,SETC            ;SET C BIT!
031664  042737  000017  031700            BIC      #17,2$             ;CLEAR ADDRESS FIELD OF INSTRUCTION
```

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031672  050037  031700                  BIS     R0,2$                   ;ADD ADDRESS TO INSTRUCTION
031676  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031700  010000                  2$:     010000                          ;LOAD MAR
031702  042737  000017  031716          BIC     #17,3$                  ;CLEAR ADDRESS OF INSTRUCTION
031710  050037  031716                  BIS     R0,3$                   ;ADD ADDRESS TO INSTRUCTION
031714  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031716  040700                  3$:     040400!<14*20>                  ;BR ← A OR B
031720  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
031722  061224                          61224                           ;MOVE BR TO PORT4
031724  111205                          MOVB    (R2),R5                 ;PUT "EXPECTED" IN R5
031726  116104  000004                  MOVB    4(R1),R4                ;PUT "FOUND" IN R4
031732  120504                          CMPB    R5,R4                   ;DATA CORRECT?
031734  001401                          BEQ     4$                      ;BR IF YES
031736  104015                          ERROR   15                      ;ALU ERROR
031740  104405                  4$:     SCOP1                           ;SWD9=1?
031742  005202                          INC     R2                      ;NEXT DATA
031744  005200                          INC     R0                      ;NEXT ADDRESS
031746  022700  000010                  CMP     #10,R0                  ;DONE YET?
031752  001342                          BNE     1$                      ;BR IF NO
031754  104420                          ADVANCE                         ; ADVANCE LOOP
031756     000     377     377  5$:     .BYTE   0,-1,-1,-1,125,-1,-1,252
031761     377     125     377
031764     377     252
                                .EVEN



                                        ;************************** TEST 116 **************************
                                        ;*ALU TEST
                                        ;*TEST OF ALU FUNCTION A XOR B WITH C BIT SET
                                        ;*ALU FUNCTION (A XOR B)    CODE=15
                                        ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                        ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                        ;:***************************************************************

                                        ;  TEST 116
                                        ;_____________
                                ;;*****************************************************************
031766  000004                  TST116: SCOPE
031770  012737  000116  001202          MOV     #116,$TSTNM                     ; LOAD THE NO. OF THIS TEST
031776  012737  032144  001442          MOV     #TST117,NEXT                    ; POINT TO THE START OF NEXT TEST.
032004  012737  032036  001444          MOV     #1$,LOCK                        ; ADDRESS FOR LOCK ON DATA.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
032012  104410                          MSTCLR                          ;MASTER CLEAR KMC11
032014  005000                          CLR     R0                      ;MEM + SP ADDRESS
032016  012702  032134                  MOV     #5$,R2                  ;POINTER TO CORRECT DATA
032022  004737  035602                  JSR     PC,MEMLD                ;LOAD 8 WORDS OF MAIN MEMORY
032026  035726                          MEMDAT                          ;POINTER TO DATA
032030  004737  035636                  JSR     PC,SPLD                 ;LOAD 8 WORDS OF SP
032034  035736                          SPDAT                           ;POINTER TO DATA
032036  004737  035714          1$:     JSR     PC,SETC                 ;SET C BIT!
032042  042737  000017  032056          BIC     #17,2$                  ;CLEAR ADDRESS FIELD OF INSTRUCTION
032050  050037  032056                  BIS     R0,2$                   ;ADD ADDRESS TO INSTRUCTION
032054  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032056  010000                  2$:     010000                          ;LOAD MAR
032060  042737  000017  032074          BIC     #17,3$                  ;CLEAR ADDRESS OF INSTRUCTION
032066  050037  032074                  BIS     R0,3$                   ;ADD ADDRESS TO INSTRUCTION
```

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032072  104412                           ROMCLK                         ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032074  040720                   3$:     040400!<15*20>                 ;BR ← A XOR B
032076  104412                           ROMCLK                         ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032100  061224                           61224                          ;MOVE BR TO PORT4
032102  111205                           MOVB    (R2),R5                ;PUT "EXPECTED" IN R5
032104  116104  000004                   MOVB    4(R1),R4               ;PUT "FOUND" IN R4
032110  120504                           CMPB    R5,R4                  ;DATA CORRECT?
032112  001401                           BEQ     4$                     ;BR IF YES
032114  104015                           ERROR   15                     ;ALU ERROR
032116  104405                   4$:     SCOP1                          ;SW09=1?
032120  005202                           INC     R2                     ;NEXT DATA
032122  005200                           INC     R0                     ;NEXT ADDRESS
032124  022700  000010                   CMP     #10,R0                 ;DONE YET?
032130  001342                           BNE     1$                     ;BR IF NO
032132  104420                           ADVANCE                        ; ADVANCE LOOP
032134     000     377     377   5$:     .BYTE   0,-1,-1,0,0,-1,-1,0
032137     000     000     377
032142     377     000
                                 .EVEN


                                         ;************************** TEST 117 **************************
                                         ;*ALU TEST
                                         ;*TEST OF ALU FUNCTION ADD WITH C BIT SET
                                         ;*ALU FUNCTION (A PLUS B)     CODE=00
                                         ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                         ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                         ;:**************************************************************

                                         ;  TEST 117
                                         ;______________
                                         ;
                                 ;;*************************************************************
032144  000004                   TST117: SCOPE
032146  012737  000117  001202           MOV     #117,$TSTNM                    ; LOAD THE NO. OF THIS TEST
032154  012737  032322  001442           MOV     #TST120,NEXT                   ; POINT TO THE START OF NEXT TEST.
032162  012737  032214  001444           MOV     #1$,LOCK                       ; ADDRESS FOR LOCK ON DATA.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
032170  104410                           MSTCLR                         ;MASTER CLEAR KMC11
032172  005000                           CLR     R0                     ;MEM + SP ADDRESS
032174  012702  032312                   MOV     #5$,R2                 ;POINTER TO CORRECT DATA
032200  004737  035602                   JSR     PC,MEMLD               ;LOAD 8 WORDS OF MAIN MEMORY
032204  035726                           MEMDAT                         ;POINTER TO DATA
032206  004737  035636                   JSR     PC,SPLD                ;LOAD 8 WORDS OF SP
032212  035736                           SPDAT                          ;POINTER TO DATA
032214  004737  035714           1$:     JSR     PC,SETC                ;SET C BIT!
032220  042737  000017  032234           BIC     #17,2$                 ;CLEAR ADDRESS FIELD OF INSTRUCTION
032226  050037  032234                   BIS     R0,2$                  ;ADD ADDRESS TO INSTRUCTION
032232  104412                           ROMCLK                         ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032234  010000                   2$:     010000                         ;LOAD MAR
032236  042737  000017  032252           BIC     #17,3$                 ;CLEAR ADDRESS OF INSTRUCTION
032244  050037  032252                   BIS     R0,3$                  ;ADD ADDRESS TO INSTRUCTION
032250  104412                           ROMCLK                         ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032252  040400                   3$:     040400!<00*20>                 ;BR ← ADD
032254  104412                           ROMCLK                         ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032256  061224                           61224                          ;MOVE BR TO PORT4
032260  111205                           MOVB    (R2),R5                ;PUT "EXPECTED" IN R5
```

```
032262  116104  000004                   MOVB    4(R1),R4           ;PUT "FOUND" IN R4
032266  120504                           CMPB    R5,R4              ;DATA CORRECT?
032270  001401                           BEQ     4$                 ;BR IF YES
032272  104015                           ERROR   15                 ;ALU ERROR
032274  104405                   4$:     SCOP1                      ;SW09=1?
032276  005202                           INC     R2                 ;NEXT DATA
032300  005200                           INC     R0                 ;NEXT ADDRESS
032302  022700  000010                   CMP     #10,R0             ;DONE YET?
032306  001342                           BNE     1$                 ;BR IF NO
032310  104420                           ADVANCE                    ; ADVANCE LOOP
032312     000     377     377   5$:     .BYTE   0,-1,-1,376,252,-1,-1,124
032315     376     252     377
032320     377     124
                                 .EVEN



                                         ;*************************** TEST 120 ***************************
                                         ;*ALU TEST
                                         ;*TEST OF ALU FUNCTION 2A W/C WITH C BIT SET
                                         ;*ALU FUNCTION (A PLUS A PLUS C)     CODE=6
                                         ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                         ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                         ;:***************************************************************

                                         ;  TEST 120
                                         ;_____________

                                 ;;*************************************************************
032322  000004                   TST120: SCOPE
032324  012737  000120  001202           MOV     #120,$TSTNM                ; LOAD THE NO. OF THIS TEST
032332  012737  032500  001442           MOV     #TST121,NEXT               ; POINT TO THE START OF NEXT TEST.
032340  012737  032372  001444           MOV     #1$,LOCK                   ; ADDRESS FOR LOCK ON DATA.
                                                                    ;R1 CONTAINS BASE KMC11 ADDRESS
032346  104410                           MSTCLR                     ;MASTER CLEAR KMC11
032350  005000                           CLR     R0                 ;MEM + SP ADDRESS
032352  012702  032470                   MOV     #5$,R2             ;POINTER TO CORRECT DATA
032356  004737  035602                   JSR     PC,MEMLD           ;LOAD 8 WORDS OF MAIN MEMORY
032362  035726                           MEMDAT                     ;POINTER TO DATA
032364  004737  035636                   JSR     PC,SPLD            ;LOAD 8 WORDS OF SP
032370  035736                           SPDAT                      ;POINTER TO DATA
032372  004737  035714           1$:     JSR     PC,SETC            ;SET C BIT!
032376  042737  000017  032412           BIC     #17,2$             ;CLEAR ADDRESS FIELD OF INSTRUCTION
032404  050037  032412                   BIS     R0,2$              ;ADD ADDRESS TO INSTRUCTION
032410  104412                           ROMCLK                     ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032412  010000                   2$:     010000                     ;LOAD MAR
032414  042737  000017  032430           BIC     #17,3$             ;CLEAR ADDRESS OF INSTRUCTION
032422  050037  032430                   BIS     R0,3$              ;ADD ADDRESS TO INSTRUCTION
032426  104412                           ROMCLK                     ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032430  040540                   3$:     040400!<6*20>              ;BR ← 2A W/C
032432  104412                           ROMCLK                     ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032434  061224                           61224                      ;MOVE BR TO PORT4
032436  111205                           MOVB    (R2),R5            ;PUT "EXPECTED" IN R5
032440  116104  000004                   MOVB    4(R1),R4           ;PUT "FOUND" IN R4
032444  120504                           CMPB    R5,R4              ;DATA CORRECT?
032446  001401                           BEQ     4$                 ;BR IF YES
032450  104015                           ERROR   15                 ;ALU ERROR
032452  104405                   4$:     SCOP1                      ;SW09=1?
```

```
032454  005202                             INC     R2                      ;NEXT DATA
032456  005200                             INC     R0                      ;NEXT ADDRESS
032460  022700  000010                     CMP     #10,R0                  ;DONE YET?
032464  001342                             BNE     1$                      ;BR IF NO
032466  104420                             ADVANCE                         ; ADVANCE LOOP
032470     001     001     377    5$:      .BYTE   1,1,-1,-1,253,253,125,125
032473     377     253     253
032476     125     125
                                  .EVEN



                                           ;************************** TEST 121 **************************
                                           ;*ALU TEST
                                           ;*TEST OF ALU FUNCTION SUB WITH C BIT SET
                                           ;*ALU FUNCTION (A-B)     CODE=16
                                           ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                           ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                           ;:*************************************************************

                                           ;   TEST 121
                                           ;--------------

                                  ;;***********************************************************
032500  000004                    TST121:  SCOPE
032502  012737  000121  001202             MOV     #121,$TSTNM                  ; LOAD THE NO. OF THIS TEST
032510  012737  032656  001442             MOV     #TST122,NEXT                 ; POINT TO THE START OF NEXT TEST.
032516  012737  032550  001444             MOV     #1$,LOCK                     ; ADDRESS FOR LOCK ON DATA.
                                                                          ;R1 CONTAINS BASE KMC11 ADDRESS
032524  104410                             MSTCLR                         ;MASTER CLEAR KMC11
032526  005000                             CLR     R0                     ;MEM + SP ADDRESS
032530  012702  032646                     MOV     #5$,R2                 ;POINTER TO CORRECT DATA
032534  004737  035602                     JSR     PC,MEMLD               ;LOAD 8 WORDS OF MAIN MEMORY
032540  035726                             MEMDAT                         ;POINTER TO DATA
032542  004737  035636                     JSR     PC,SPLD                ;LOAD 8 WORDS OF SP
032546  035736                             SPDAT                          ;POINTER TO DATA
032550  004737  035714            1$:      JSR     PC,SETC                ;SET C BIT!
032554  042737  000017  032570             BIC     #17,2$                 ;CLEAR ADDRESS FIELD OF INSTRUCTION
032562  050037  032570                     BIS     R0,2$                  ;ADD ADDRESS TO INSTRUCTION
032566  104412                             ROMCLK                         ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032570  010000                    2$:      010000                         ;LOAD MAR
032572  042737  000017  032606             BIC     #17,3$                 ;CLEAR ADDRESS OF INSTRUCTION
032600  050037  032606                     BIS     R0,3$                  ;ADD ADDRESS TO INSTRUCTION
032604  104412                             ROMCLK                         ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032606  040740                    3$:      040400!<16*20>                 ;BR + SUB
032610  104412                             ROMCLK                         ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032612  061224                             61224                          ;MOVE BR TO PORT4
032614  111205                             MOVB    (R2),R5                ;PUT "EXPECTED" IN R5
032616  116104  000004                     MOVB    4(R1),R4               ;PUT "FOUND" IN R4
032622  120504                             CMPB    R5,R4                  ;DATA CORRECT?
032624  001401                             BEQ     4$                     ;BR IF YES
032626  104015                             ERROR   15                     ;ALU ERROR
032630  104405                    4$:      SCOP1                          ;SW09=1?
032632  005202                             INC     R2                     ;NEXT DATA
032634  005200                             INC     R0                     ;NEXT ADDRESS
032636  022700  000010                     CMP     #10,R0                 ;DONE YET?
032642  001342                             BNE     1$                     ;BR IF NO
032644  104420                             ADVANCE                        ; ADVANCE LOOP
```

```
032646     000     001     377  5$:     .BYTE   0,1,-1,0,0,253,125,0
032651     000     000     253
032654     125     000
                                .EVEN


                                        ;*************************** TEST 122 ***************************
                                        ;*ALU TEST
                                        ;*TEST OF ALU FUNCTION ADD W/C WITH C BIT SET
                                        ;*ALU FUNCTION (A PLUS B PLUS C)     CODE=01
                                        ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                        ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                        ;:****************************************************************

                                        ;  TEST 122
                                        ;--------------

                                ;:*********************************************************************
032656  000004                  TST122: SCOPE
032660  012737  000122  001202          MOV     #122,$TSTNM             ; LOAD THE NO. OF THIS TEST
032666  012737  033034  001442          MOV     #TST123,NEXT            ; POINT TO THE START OF NEXT TEST.
032674  012737  032726  001444          MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
032702  104410                          MSTCLR                          ;MASTER CLEAR KMC11
032704  005000                          CLR     R0                      ;MEM + SP ADDRESS
032706  012702  033024                  MOV     #5$,R2                  ;POINTER TO CORRECT DATA
032712  004737  035602                  JSR     PC,MEMLD                ;LOAD 8 WORDS OF MAIN MEMORY
032716  035726                          MEMDAT                          ;POINTER TO DATA
032720  004737  035636                  JSR     PC,SPLD                 ;LOAD 8 WORDS OF SP
032724  035736                          SPDAT                           ;POINTER TO DATA
032726  004737  035714          1$:     JSR     PC,SETC                 ;SET C BIT!
032732  042737  000017  032746          BIC     #17,2$                  ;CLEAR ADDRESS FIELD OF INSTRUCTION
032740  050037  032746                  BIS     R0,2$                   ;ADD ADDRESS TO INSTRUCTION
032744  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032746  010000                  2$:     010000                          ;LOAD MAR
032750  042737  000017  032764          BIC     #17,3$                  ;CLEAR ADDRESS OF INSTRUCTION
032756  050037  032764                  BIS     R0,3$                   ;ADD ADDRESS TO INSTRUCTION
032762  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032764  040420                  3$:     040400!<01*20>                  ;BR ← ADD W/C
032766  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
032770  061224                          61224                           ;MOVE BR TO PORT4
032772  111205                          MOVB    (R2),R5                 ;PUT "EXPECTED" IN R5
032774  116104  000004                  MOVB    4(R1),R4                ;PUT "FOUND" IN R4
033000  120504                          CMPB    R5,R4                   ;DATA CORRECT?
033002  001401                          BEQ     4$                      ;BR IF YES
033004  104015                          ERROR   15                      ;ALU ERROR
033006  104405                  4$:     SCOP1                           ;SW09=1?
033010  005202                          INC     R2                      ;NEXT DATA
033012  005200                          INC     R0                      ;NEXT ADDRESS
033014  022700  000010                  CMP     #10,R0                  ;DONE YET?
033020  001342                          BNE     1$                      ;BR IF NO
033022  104420                          ADVANCE                         ; ADVANCE LOOP
033024     001     000     000  5$:     .BYTE   1,0,0,-1,253,0,0,125
033027     377     253     000
033032     000     125
                                .EVEN

```

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                                                     ;************************** TEST 123 **************************
                                                     ;*ALU TEST
                                                     ;*TEST OF ALU FUNCTION SUB W/C WITH C BIT SET
                                                     ;*ALU FUNCTION (A-B-C)     CODE=2
                                                     ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                                     ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                                     ;:*************************************************************

                                                     ;  TEST 123
                                                     ;--------------
                                                 ::*********************************************************
 033034  000004                                  TST123: SCOPE
 033036  012737  000123  001202                          MOV     #123,$TSTNM             ; LOAD THE NO. OF THIS TEST
 033044  012737  033212  001442                          MOV     #TST124,NEXT            ; POINT TO THE START OF NEXT TEST.
 033052  012737  033104  001444                          MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
                                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
 033060  104410                                          MSTCLR                         ;MASTER CLEAR KMC11
 033062  005000                                          CLR     R0                     ;MEM + SP ADDRESS
 033064  012702  033202                                  MOV     #5$,R2                 ;POINTER TO CORRECT DATA
 033070  004737  035602                                  JSR     PC,MEMLD               ;LOAD 8 WORDS OF MAIN MEMORY
 033074  035726                                          MEMDAT                         ;POINTER TO DATA
 033076  004737  035636                                  JSR     PC,SPLD                ;LOAD 8 WORDS OF SP
 033102  035736                                          SPDAT                          ;POINTER TO DATA
 033104  004737  035714                          1$:     JSR     PC,SETC                ;SET C BIT!
 033110  042737  000017  033124                          BIC     #17,2$                 ;CLEAR ADDRESS FIELD OF INSTRUCTION
 033116  050037  033124                                  BIS     R0,2$                  ;ADD ADDRESS TO INSTRUCTION
 033122  104412                                          ROMCLK                         ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 033124  010000                                  2$:     010000                         ;LOAD MAR
 033126  042737  000017  033142                          BIC     #17,3$                 ;CLEAR ADDRESS OF INSTRUCTION
 033134  050037  033142                                  BIS     R0,3$                  ;ADD ADDRESS TO INSTRUCTION
 033140  104412                                          ROMCLK                         ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 033142  040440                                  3$:     040400!<2*20>                  ;BR ← SUB W/C
 033144  104412                                          ROMCLK                         ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 033146  061224                                          61224                          ;MOVE BR TO PORT4
 033150  111205                                          MOVB    (R2),R5                ;PUT "EXPECTED" IN R5
 033152  116104  000004                                  MOVB    4(R1),R4               ;PUT "FOUND" IN R4
 033156  120504                                          CMPB    R5,R4                  ;DATA CORRECT?
 033160  001401                                          BEQ     4$                     ;BR IF YES
 033162  104015                                          ERROR   15                     ;ALU ERROR
 033164  104405                                  4$:     SCOP1                          ;SW09=1?
 033166  005202                                          INC     R2                     ;NEXT DATA
 033170  005200                                          INC     R0                     ;NEXT ADDRESS
 033172  022700  000010                                  CMP     #10,R0                 ;DONE YET?
 033176  001342                                          BNE     1$                     ;BR IF NO
 033200  104420                                          ADVANCE                        ; ADVANCE LOOP
 033202     000     001     377                  5$:     .BYTE   0,1,-1,0,0,253,125,0
 033205     000     000     253
 033210     125     000
                                                 .EVEN


                                                     ;************************** TEST 124 **************************
                                                     ;*ALU TEST
                                                     ;*TEST OF ALU FUNCTION INC A WITH C BIT SET
                                                     ;*ALU FUNCTION (A PLUS 1)     CODE=3
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                                                ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                                ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                                ;:*****************************************************

                                                ;  TEST 124
                                                ;--------------
                                                ;
                                        ;:******************************************************
 033212  000004                          TST124: SCOPE
 033214  012737  000124  001202                  MOV     #124,$TSTNM             ; LOAD THE NO. OF THIS TEST
 033222  012737  033370  001442                  MOV     #TST125,NEXT            ; POINT TO THE START OF NEXT TEST.
 033230  012737  033262  001444                  MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
 033236  104410                                  MSTCLR                 ;MASTER CLEAR KMC11
 033240  005000                                  CLR     R0             ;MEM + SP ADDRESS
 033242  012702  033360                          MOV     #5$,R2         ;POINTER TO CORRECT DATA
 033246  004737  035602                          JSR     PC,MEMLD       ;LOAD 8 WORDS OF MAIN MEMORY
 033252  035726                                  MEMDAT                 ;POINTER TO DATA
 033254  004737  035636                          JSR     PC,SPLD        ;LOAD 8 WORDS OF SP
 033260  035736                                  SPDAT                  ;POINTER TO DATA
 033262  004737  035714                  1$:     JSR     PC,SETC        ;SET C BIT!
 033266  042737  000017  033302                  BIC     #17,2$         ;CLEAR ADDRESS FIELD OF INSTRUCTION
 033274  050037  033302                          BIS     R0,2$          ;ADD ADDRESS TO INSTRUCTION
 033300  104412                                  ROMCLK                 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 033302  010000                          2$:     010000                 ;LOAD MAR
 033304  042737  000017  033320                  BIC     #17,3$         ;CLEAR ADDRESS OF INSTRUCTION
 033312  050037  033320                          BIS     R0,3$          ;ADD ADDRESS TO INSTRUCTION
 033316  104412                                  ROMCLK                 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 033320  040460                          3$:     040400!<3*20>          ;BR ← INC A
 033322  104412                                  ROMCLK                 ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 033324  061224                                  61224                  ;MOVE BR TO PORT4
 033326  111205                                  MOVB    (R2),R5        ;PUT "EXPECTED" IN R5
 033330  116104  000004                          MOVB    4(R1),R4       ;PUT "FOUND" IN R4
 033334  120504                                  CMPB    R5,R4          ;DATA CORRECT?
 033336  001401                                  BEQ     4$             ;BR IF YES
 033340  104015                                  ERROR   15             ;ALU ERROR
 033342  104405                          4$:     SCOP1                  ;SW09=1?
 033344  005202                                  INC     R2             ;NEXT DATA
 033346  005200                                  INC     R0             ;NEXT ADDRESS
 033350  022700  000010                          CMP     #10,R0         ;DONE YET?
 033354  001342                                  BNE     1$             ;BR IF NO
 033356  104420                                  ADVANCE                ; ADVANCE LOOP
 033360     001     001     000          5$:     .BYTE   1,1,0,0,126,126,253,253
 033363     000     126     126
 033366     253     253
                                         .EVEN



                                                ;************************* TEST 125 *************************
                                                ;*ALU TEST
                                                ;*TEST OF ALU FUNCTION 2A WITH C BIT SET
                                                ;*ALU FUNCTION (A PLUS A)     CODE=5
                                                ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                                ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                                ;:*****************************************************

                                                ;  TEST 125
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                                                ;;*****************************************************
033370  000004                                  TST125: SCOPE
033372  012737  000125  001202                          MOV     #125,$TSTNM             ; LOAD THE NO. OF THIS TEST
033400  012737  033546  001442                          MOV     #TST126,NEXT            ; POINT TO THE START OF NEXT TEST.
033406  012737  033440  001444                          MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
                                                                                ;R1 CONTAINS BASE KMC11 ADDRESS
033414  104410                                          MSTCLR                  ;MASTER CLEAR KMC11
033416  005000                                          CLR     R0              ;MEM + SP ADDRESS
033420  012702  033536                                  MOV     #5$,R2          ;POINTER TO CORRECT DATA
033424  004737  035602                                  JSR     PC,MEMLD        ;LOAD 8 WORDS OF MAIN MEMORY
033430  035726                                          MEMDAT                  ;POINTER TO DATA
033432  004737  035636                                  JSR     PC,SPLD         ;LOAD 8 WORDS OF SP
033436  035736                                          SPDAT                   ;POINTER TO DATA
033440  004737  035714                          1$:     JSR     PC,SETC         ;SET C BIT!
033444  042737  000017  033460                          BIC     #17,2$          ;CLEAR ADDRESS FIELD OF INSTRUCTION
033452  050037  033460                                  BIS     R0,2$           ;ADD ADDRESS TO INSTRUCTION
033456  104412                                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
033460  010000                                  2$:     010000                  ;LOAD MAR
033462  042737  000017  033476                          BIC     #17,3$          ;CLEAR ADDRESS OF INSTRUCTION
033470  050037  033476                                  BIS     R0,3$           ;ADD ADDRESS TO INSTRUCTION
033474  104412                                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
033476  040520                                  3$:     040400!<5*20>           ;BR ← 2A
033500  104412                                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
033502  061224                                          61224                   ;MOVE BR TO PORT4
033504  111205                                          MOVB    (R2),R5         ;PUT "EXPECTED" IN R5
033506  116104  000004                                  MOVB    4(R1),R4        ;PUT "FOUND" IN R4
033512  120504                                          CMPB    R5,R4           ;DATA CORRECT?
033514  001401                                          BEQ     4$              ;BR IF YES
033516  104015                                          ERROR   15              ;ALU ERROR
033520  104405                                  4$:     SCOP1                   ;SW09=1?
033522  005202                                          INC     R2              ;NEXT DATA
033524  005200                                          INC     R0              ;NEXT ADDRESS
033526  022700  000010                                  CMP     #10,R0          ;DONE YET?
033532  001342                                          BNE     1$              ;BR IF NO
033534  104420                                          ADVANCE                 ; ADVANCE LOOP
033536     000     000     376                  5$:     .BYTE   0,0,376,376,252,252,124,124
033541     376     252     252
033544     124     124
                                                .EVEN



                                                        ;*************************** TEST 126 ***************************
                                                        ;*ALU TEST
                                                        ;*TEST OF ALU FUNCTION A PLUS C WITH C BIT SET
                                                        ;*ALU FUNCTION (A PLUS C)    CODE=4
                                                        ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                                        ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                                        ;;**************************************************************

                                                        ;  TEST 126
                                                        ;--------------
                                                ;;*****************************************************
033546  000004                                  TST126: SCOPE
033550  012737  000126  001202                          MOV     #126,$TSTNM             ; LOAD THE NO. OF THIS TEST
033556  012737  033724  001442                          MOV     #TST127,NEXT            ; POINT TO THE START OF NEXT TEST.
```

```
033564  012737  033616  001444             MOV     #1$,LOCK                  ; ADDRESS FOR LOCK ON DATA.
                                                                         ;R1 CONTAINS BASE KMC11 ADDRESS
033572  104410                             MSTCLR                        ;MASTER CLEAR KMC11
033574  005000                             CLR     R0                    ;MEM + SP ADDRESS
033576  012702  033714                     MOV     #5$,R2                ;POINTER TO CORRECT DATA
033602  004737  035602                     JSR     PC,MEMLD              ;LOAD 8 WORDS OF MAIN MEMORY
033606  035726                             MEMDAT                        ;POINTER TO DATA
033610  004737  035636                     JSR     PC,SPLD               ;LOAD 8 WORDS OF SP
033614  035736                             SPDAT                         ;POINTER TO DATA
033616  004737  035714            1$:      JSR     PC,SETC               ;SET C BIT!
033622  042737  000017  033636             BIC     #17,2$                ;CLEAR ADDRESS FIELD OF INSTRUCTION
033630  050037  033636                     BIS     R0,2$                 ;ADD ADDRESS TO INSTRUCTION
033634  104412                             ROMCLK                        ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
033636  010000                    2$:      010000                        ;LOAD MAR
033640  042737  000017  033654             BIC     #17,3$                ;CLEAR ADDRESS OF INSTRUCTION
033646  050037  033654                     BIS     R0,3$                 ;ADD ADDRESS TO INSTRUCTION
033652  104412                             ROMCLK                        ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
033654  040500                    3$:      040400!<4*20>                 ;BR + A PLUS C
033656  104412                             ROMCLK                        ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
033660  061224                             61224                         ;MOVE BR TO PORT4
033662  111205                             MOVB    (R2),R5               ;PUT "EXPECTED" IN R5
033664  116104  000004                     MOVB    4(R1),R4              ;PUT "FOUND" IN R4
033670  120504                             CMPB    R5,R4                 ;DATA CORRECT?
033672  001401                             BEQ     4$                    ;BR IF YES
033674  104015                             ERROR   15                    ;ALU ERROR
033676  104405                    4$:      SCOP1                         ;SW09=1?
033700  005202                             INC     R2                    ;NEXT DATA
033702  005200                             INC     R0                    ;NEXT ADDRESS
033704  022700  000010                     CMP     #10,R0                ;DONE YET?
033710  001342                             BNE     1$                    ;BR IF NO
033712  104420                             ADVANCE                       ; ADVANCE LOOP
033714     001     001     000    5$:      .BYTE   1,1,0,0,126,126,253,253
033717     000     126     126
033722     253     253
                                  .EVEN



                                           ;*************************** TEST 127 ***************************
                                           ;*ALU TEST
                                           ;*TEST OF ALU FUNCTION 2'S COMP SUB WITH C BIT SET
                                           ;*ALU FUNCTION (A-B-1)    CODE=17
                                           ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                           ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                           ;*****************************************************************


                                           ;  TEST 127
                                           ;-------------

                                  ;;*****************************************************************
033724  000004                    TST127:  SCOPE
033726  012737  000127  001202             MOV     #127,$TSTNM              ; LOAD THE NO. OF THIS TEST
033734  012737  034102  001442             MOV     #TST130,NEXT             ; POINT TO THE START OF NEXT TEST.
033742  012737  033774  001444             MOV     #1$,LOCK                 ; ADDRESS FOR LOCK ON DATA.
                                                                         ;R1 CONTAINS BASE KMC11 ADDRESS
033750  104410                             MSTCLR                        ;MASTER CLEAR KMC11
033752  005000                             CLR     R0                    ;MEM + SP ADDRESS
033754  012702  034072                     MOV     #5$,R2                ;POINTER TO CORRECT DATA
```

```
033760  004737  035602                  JSR     PC,MEMLD                ;LOAD 8 WORDS OF MAIN MEMORY
033764  035726                          MEMDAT                          ;POINTER TO DATA
033766  004737  035636                  JSR     PC,SPLD                 ;LOAD 8 WORDS OF SP
033772  035736                          SPDAT                           ;POINTER TO DATA
033774  004737  035714          1$:     JSR     PC,SETC                 ;SET C BIT!
034000  042737  000017  034014          BIC     #17,2$                  ;CLEAR ADDRESS FIELD OF INSTRUCTION
034006  050037  034014                  BIS     R0,2$                   ;ADD ADDRESS TO INSTRUCTION
034012  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034014  010000                  2$:     010000                          ;LOAD MAR
034016  042737  000017  034032          BIC     #17,3$                  ;CLEAR ADDRESS OF INSTRUCTION
034024  050037  034032                  BIS     R0,3$                   ;ADD ADDRESS TO INSTRUCTION
034030  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034032  040760                  3$:     040400!<17*20>                  ;BR ← 2'S COMP SUB
034034  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034036  061224                          61224                           ;MOVE BR TO PORT4
034040  111205                          MOVB    (R2),R5                 ;PUT "EXPECTED" IN R5
034042  116104  000004                  MOVB    4(R1),R4                ;PUT "FOUND" IN R4
034046  120504                          CMPB    R5,R4                   ;DATA CORRECT?
034050  001401                          BEQ     4$                      ;BR IF YES
034052  104015                          ERROR   15                      ;ALU ERROR
034054  104405                  4$:     SCOP1                           ;SW09=1?
034056  005202                          INC     R2                      ;NEXT DATA
034060  005200                          INC     R0                      ;NEXT ADDRESS
034062  022700  000010                  CMP     #10,R0                  ;DONE YET?
034066  001342                          BNE     1$                      ;BR IF NO
034070  104420                          ADVANCE                         ; ADVANCE LOOP
034072     377     000     376  5$:     .BYTE   -1,0,376,-1,-1,252,124,-1
034075     377     377     252
034100     124     377
                                .EVEN



                                        ;************************** TEST 130 **************************
                                        ;*ALU TEST
                                        ;*TEST OF ALU FUNCTION DEC A WITH C BIT SET
                                        ;*ALU FUNCTION (A-1)    CODE=7
                                        ;*LOAD MAIN MEM AND SP WITH 8 WORDS OF DATA
                                        ;*PERFORM THE FUNCTION, VERIFY THE RESULTS
                                        ;**************************************************************

                                        ;  TEST 130
                                        ;------------

                                ;;*************************************************************
034102  000004                  TST130: SCOPE
034104  012737  000130  001202          MOV     #130,$TSTNM             ; LOAD THE NO. OF THIS TEST
034112  012737  034260  001442          MOV     #TST131,NEXT            ; POINT TO THE START OF NEXT TEST.
034120  012737  034152  001444          MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
034126  104410                          MSTCLR                          ;MASTER CLEAR KMC11
034130  005000                          CLR     R0                      ;MEM + SP ADDRESS
034132  012702  034250                  MOV     #5$,R2                  ;POINTER TO CORRECT DATA
034136  004737  035602                  JSR     PC,MEMLD                ;LOAD 8 WORDS OF MAIN MEMORY
034142  035726                          MEMDAT                          ;POINTER TO DATA
034144  004737  035636                  JSR     PC,SPLD                 ;LOAD 8 WORDS OF SP
034150  035736                          SPDAT                           ;POINTER TO DATA
034152  004737  035714          1$:     JSR     PC,SETC                 ;SET C BIT!
```

```
034156  042737  000017  034172          BIC     #17,2$          ;CLEAR ADDRESS FIELD OF INSTRUCTION
034164  050037  034172                  BIS     R0,2$           ;ADD ADDRESS TO INSTRUCTION
034170  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034172  010000                  2$:     010000                  ;LOAD MAR
034174  042737  000017  034210          BIC     #17,3$          ;CLEAR ADDRESS OF INSTRUCTION
034202  050037  034210                  BIS     R0,3$           ;ADD ADDRESS TO INSTRUCTION
034206  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034210  040560                  3$:     040400!<7*20>           ;BR ← DEC A
034212  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034214  061224                          61224                   ;MOVE BR TO PORT4
034216  111205                          MOVB    (R2),R5         ;PUT "EXPECTED" IN R5
034220  116104  000004                  MOVB    4(R1),R4        ;PUT "FOUND" IN R4
034224  120504                          CMPB    R5,R4           ;DATA CORRECT?
034226  001401                          BEQ     4$              ;BR IF YES
034230  104015                          ERROR   15              ;ALU ERROR
034232  104405                  4$:     SCOP1                   ;SW09=1?
034234  005202                          INC     R2              ;NEXT DATA
034236  005200                          INC     R0              ;NEXT ADDRESS
034240  022700  000010                  CMP     #10,R0          ;DONE YET?
034244  001342                          BNE     1$              ;BR IF NO
034246  104420                          ADVANCE                 ; ADVANCE LOOP
034250     377     377     376  5$:     .BYTE   -1,-1,376,376,124,124,251,251
034253     376     124     124
034256     251     251
                                .EVEN


                                        ;************************** TEST 131 **************************
                                        ;*TEST OF PROGRAM CLOCK BIT
                                        ;*DO A MASTER CLEAR, VERIFY THAT PROGRAM CLOCK IS SET
                                        ;*WRITE PROGRAM CLOCK BIT TO A ONE, VERIFY THAT IT CLEARS,
                                        ;*AND THEN SETS SOME TIME LATER
                                        ;:**************************************************************

                                        ;  TEST 131
                                        ;--------------
                                ;:*************************************************************
034260  000004                  TST131: SCOPE
034262  012737  000131  001202          MOV     #131,$TSTNM             ; LOAD THE NO. OF THIS TEST
034270  012737  034466  001442          MOV     #TST132,NEXT            ; POINT TO THE START OF NEXT TEST.
                                                                ;R1 CONTAINS BASE KMC11 ADDRESS
034276  104410                          MSTCLR                  ;MASTER CLEAR KMC11
034300  005037  011106                  CLR     TEMP            ;PREPARE FOR
034304  005037  001276                  CLR     $TMP0           ;DELAY
034310  012702  000011                  MOV     #11,R2          ;SAVE FOR TYPEOUT
034314  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034316  121224                          121224                  ;PORT4←LU11
034320  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
034324  042704  000357                  BIC     #357,R4         ;CLEAR UNWANTED BITS
034330  012705  000020                  MOV     #20,R5          ;PUT "EXPECTED" IN R5
034334  120504                          CMPB    R5,R4           ;IS PGM CLOCK SET?
034336  001401                          BEQ     1$
034340  104016                          ERROR   16              ;ERROR, PGM CLOCK IS NOT SET
034342  012761  000020  000004  1$:     MOV     #20,4(R1)       ;LOAD PORT 4
034350  152761  000002  000001          BISB    #BIT1,1(R1)     ;SET ROMI
034356  012761  121111  000006          MOV     #121111,6(R1)   ;SEL6 ← INSTRUCTION
```

```
034364  152761  000003  000001                  BISB    #BIT1!BIT0,1(R1);SET CLOCK BIT
034372  012761  121224  000006                  MOV     #121224,6(R1)   ;LOAD NEXT INSTRUCTION
034400  152761  000003  000001                  BISB    #BIT1!BIT0,1(R1);READ CLOCK BIT
034406  142761  000003  000001                  BICB    #BIT1!BIT0,1(R1);CLEAR MAINT BITS
034414  016104  000004                          MOV     4(R1),R4        ;PUT "FOUND" IN R4
034420  005005                                  CLR     R5              ;PUT "EXPECTED" IN R5
034422  120504                                  CMPB    R5,R4           ;IS PGM CLOCK CLEAR?
034424  001401                                  BEQ     2$
034426  104016                                  ERROR   16              ;ERROR, PGM CLOCK IS NOT CLEAR
034430                                  2$:
034430  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034432  121224                                  121224                  ;PORT4←LU11
034434  122761  000020  000004                  CMPB    #20,4(R1)       ;IS PGM CLOCK SET?
034442  001411                                  BEQ     3$              ;BR IF YES
034444  005237  011106                          INC     TEMP            ;INCREMENT DELAY
034450  005537  001276                          ADC     $TMP0           ;INCREMENT DELAY
034454  022737  000006  001276                  CMP     #6,$TMP0        ;IS DELAY DONE
034462  001362                                  BNE     2$              ;BR IF NO
034464  104016                                  ERROR   16              ;ERROR PGM CLOCK NOT SET
034466                                  3$:



                                                ;************************** TEST 132 **************************
                                                ;*FORCE POWER FAIL TEST
                                                ;*SET FORCE POWER FAIL BIT VERIFY THAT PROCESSOR TRAPS TO 24
                                                ;*GOING DOWN AND COMING UP. VERIFY ALSO THAT BUS INIT WAS
                                                ;*BLOCKED FROM GETTING TO THE KMC DURING THE POWER FAIL
                                                ;;*************************************************************


                                                ;  TEST 132
                                                ;--------------

                                        ;;************************************************************
034466  000004                          TST132: SCOPE
034470  012737  000132  001202                  MOV     #132,$TSTNM                     ; LOAD THE NO. OF THIS TEST
034476  012737  034660  001442                  MOV     #TST133,NEXT                    ; POINT TO THE START OF NEXT TEST.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
034504  104410                                  MSTCLR                  ;MASTER CLEAR KMC11
034506  005037  011106                          CLR     TEMP            ;PREPARE FOR DELAY
034512  013746  000024                          MOV     @#24,-(SP)      ;STORE POWER FAIL ADDRESS
034516  012737  034562  000024                  MOV     #1$,@#24        ;SET UP FOR FORCE POWER FAIL
034524  012761  000002  000004                  MOV     #2,4(R1)        ;LOAD PORT4
034532  012711  001000                          MOV     #BIT9,(R1)      ;SET ROMI
034536  012761  121111  000006                  MOV     #121111,6(R1)   ;LOAD INSTRUCTION
034544  012711  001400                          MOV     #BIT9!BIT8,(R1) ;CLOCK INSTRUCTION
034550  005237  011106                  5$:     INC     TEMP            ;WAIT FOR POWER FAIL
034554  001375                                  BNE     5$              ;BR IF DELAY NOT DONE
034556  104017                                  ERROR   17              ;ERROR, NO POWER FAIL
034560  000426                                  BR      4$
034562  012737  034600  000024          1$:     MOV     #3$,@#24        ;POWER UP ADDRESS
034570  010637  034576                          MOV     SP,2$           ;STORE STACK
034574  000000                                  HALT                    ;WAIT FOR POWER UP SEQUENCE
034576  000000                          2$:     0
034600  013706  034576                  3$:     MOV     2$,SP           ;RESTORE STACK
034604  022626                                  POP2SP                  ;POP STACK TWICE
034606  012637  000024                          MOV     (SP)+,@#24      ;RESTORE TRUE POWER FAIL ADDRESS
034612  022737  007126  000024                  CMP     #$PWRDN,@#24    ;IS IT CORRECT?
```

```
034620  001406                          BEQ     4$                      ;BR IF YES
034622  104017                          ERROR   17                      ;ERROR, STACK IS INCORRECT
034624  012737  007126  000024          MOV     #$PWRDN,@#24            ;RESTORE TRUE POWER FAIL ADDRESS
034632  012706  001200                  MOV     #STACK,SP               ;RESTORE STACK
034636  012711  003000          4$:     MOV     #BIT9!BIT10,(R1)        ;SEL6 = MAINT IR
034642  012705  121111                  MOV     #121111,R5              ;R5 = EXPECTED
034646  016104  000004                  MOV     4(R1),R4                ;R4 = FOUND
034652  020504                          CMP     R5,R4                   ;MAINT IR SHOULD = 12111
034654  001401                          BEQ     .+4                     ;BR IF OK
034656  104025                          ERROR   25                      ;IF = 0 THEN BUS INIT WAS
                                                                        ;NOT BLOCKED FROM CLEARING
                                                                        ;THE KMC-11


                                        ;*************************** TEST 133 *************************
                                        ;*MICRO-PROCESSOR NOISE TEST
                                        ;*WRITE ALL ZERO'S THEN ALL ONE'S THEN A DATA PATTERN
                                        ;*TO THE IBUS* AND IBUS REGISTERS AND TO THE SP AND MAIN MEM
                                        ;*THEN GO BACK AND READ THE DATA PATERNS  TO VERIFY THAT
                                        ;*READING AND WRITING OF OTHER LOCATIONS AND REGISTERS
                                        ;*DID NOT CHANGE THE DATA.
                                        ;:**************************************************************

                                        ;  TEST 133
                                        ;--------------
                                ;;*************************************************************
034660  000004                  TST133: SCOPE
034662  012737  000133  001202          MOV     #133,$TSTNM                     ; LOAD THE NO. OF THIS TEST
034670  012737  003662  001442          MOV     #$EOP,NEXT                      ; POINT TO THE END OF PASS HANDLER.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
034676  104410                          MSTCLR                          ;MASTER CLEAR KMC11
034700  005002                          CLR     R2                      ;R2 IS INDEX REGISTER
034702  042737  000017  034726  1$:     BIC     #17,2$                  ;CLEAR ADDRESS FIELD
034710  156237  035502  034726          BISB    30$(R2),2$              ;ADD IBUS* REG ADDRESS TO INSTRUCTION
034716  116261  035510  000004          MOVB    31$(R2),4(R1)           ;LOAD PORT4
034724  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
034726  121100                  2$:     121100                          ;WRITE IBUS* REGISTER
034730  005202                          INC     R2                      ;INC INDEX REGISTER
034732  022702  000005                  CMP     #5,R2                   ;DONE YET?
034736  001361                          BNE     1$                      ;BR IF NO
034740  005002                          CLR     R2                      ;R2 IS IBUS REGISTER ADDRESS
034742  042737  000017  035006  3$:     BIC     #17,4$                  ;CLEAR ADDRESS FIELD OF INSTRUCTIONS
034750  042737  000017  035020          BIC     #17,5$
034756  042737  000017  035030          BIC     #17,6$
034764  050237  035006                  BIS     R2,4$                   ;ADD IBUS REG ADDRESS TO INSTRUCTION
034770  050237  035020                  BIS     R2,5$
034774  050237  035030                  BIS     R2,6$
035000  105061  000004                  CLRB    4(R1)                   ;CLEAR PORT4
035004  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035006  122100                  4$:     122100                          ;WRITE 0 TO IBUS REG
035010  112761  000377  000004          MOVB    #377,4(R1)              ;LOAD PORT4
035016  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035020  122100                  5$:     122100                          ;WRITE ALL ONES TO IBUS REG
035022  110261  000004                  MOVB    R2,4(R1)                ;LOAD PORT4
035026  104412                          ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035030  122100                  6$:     122100                          ;WRITE ITS OWN ADDRESS TO IBUS REG
```

```
035032  005202                          INC     R2              ;NEXT ADDRESS
035034  022702  000010                  CMP     #10,R2          ;DONE YET?
035040  001340                          BNE     3$              ;BR IF NO
035042  005002                          CLR     R2              ;START AT SP ADDRESS 0
035044  042737  000017  035110  7$:     BIC     #17,8$          ;CLEAR ADDRESS FIELD
035052  042737  000017  035122          BIC     #17,9$
035060  042737  000017  035132          BIC     #17,10$
035066  050237  035110                  BIS     R2,8$           ;ADD ADDRESS TO INSTRUCTION
035072  050237  035122                  BIS     R2,9$
035076  050237  035132                  BIS     R2,10$
035102  105061  000004                  CLRB    4(R1)           ;CLEAR PORT4
035106  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035110  123100                  8$:     123100                  ;WRITE ZERO TO SP
035112  112761  000377  000004          MOVB    #377,4(R1)      ;LOAD PORT4
035120  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035122  123100                  9$:     123100                  ;WRITE ALL ONES TO SP
035124  110261  000004                  MOVB    R2,4(R1)        ;LOAD PORT4
035130  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035132  123100                  10$:    123100                  ;WRITE SP ADDRESS TO ITSELF
035134  005202                          INC     R2              ;NEXT SP ADDRESS
035136  022702  000020                  CMP     #20,R2          ;DONE YET?
035142  001340                          BNE     7$              ;BR IF NO
035144  005002                          CLR     R2              ;R2 = MAIN MEM ADDRESS
035146  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035150  010000                          010000                  ;MAR ← 0
035152  105061  000004          11$:    CLRB    4(R1)           ;CLEAR PORT4
035156  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035160  122500                          122500                  ;WRITE ZEROS TO MEM
035162  112761  000377  000004          MOVB    #377,4(R1)      ;LOAD PORT4
035170  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035172  122500                          122500                  ;WRITE ONES TO MEM
035174  110261  000004                  MOVB    R2,4(R1)        ;LOAD PORT4
035200  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035202  136500                          136500                  ;WRITE TO MEM IT OWN ADDRESS
035204  005202                          INC     R2              ;NEXT MEM ADDRESS
035206  022702  001000          CMP     #1000,R2                ;DONE YET?
035212  001357                          BNE     11$             ;BR IF NO

                                        ;NOW GO BACK AND READ EVERYTHING

035214  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035216  010000                          010000                  ;MAR←0
035220  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035222  004000                          4000                    ;MAR HI ← 0 (KMC ONLY)
035224  005000                          CLR     R0              ;R0 IS INDEX REGISTER
035226  042737  000360  035264  12$:    BIC     #360,13$        ;CLEAR ADDRESS FIELD
035234  116002  035502                  MOVB    30$(R0),R2      ;R2 = IBUS* ADDRESS
035240  010203                          MOV     R2,R3           ;PUT IBUS* ADDRESS IN R3
035242  006303                          ASL     R3              ;SHIFT ADDRESS TO BITS 4-7
035244  006303                          ASL     R3
035246  006303                          ASL     R3
035250  006303                          ASL     R3
035252  050337  035264                  BIS     R3,13$          ;ADD ADDRESS TO INSTRUCTION
035256  116005  035510                  MOVB    31$(R0),R5      ;R5 = "EXPECTED"
035262  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035264  121004                  13$:    121004                  ;PORT4 ← IBUS* REGISTER
```

```
035266  016104  000004                  MOV     4(R1),R4          ;R4 = "FOUND"
035272  120504                          CMPB    R5,R4             ;IBUS* CONTENTS OK?
035274  001401                          BEQ     .+4               ;BR IF YES
035276  104004                          ERROR   4                 ;IBUS* DATA ERROR
035300  005200                          INC     R0                ;INC COUNTER
035302  022700  000005                  CMP     #5,R0             ;DONE YET?
035306  001347                          BNE     12$               ;BR IF NO
035310  005002                          CLR     R2                ;R2 = IBUS REG ADDRESS
035312  042737  000360  035342  14$:    BIC     #360,15$          ;CLEAR ADDRESS FIELD OF INSTRUCTION
035320  010203                          MOV     R2,R3             ;R3 = IBUS ADDRESS
035322  006303                          ASL     R3                ;SHIFT ADDRESS TO BITS 4-7
035324  006303                          ASL     R3
035326  006303                          ASL     R3
035330  006303                          ASL     R3
035332  050337  035342                  BIS     R3,15$            ;ADD ADDRESS TO INSTUCTION
035336  010205                          MOV     R2,R5             ;R5 = "EXPECTED"
035340  104412                          ROMCLK                    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035342  021004                  15$:    021004                    ;PORT4 ← IBUS REG
035344  016104  000004                  MOV     4(R1),R4          ;R4 = "FOUND"
035350  120504                          CMPB    R5,R4             ;IBUS CONTENTS OK?
035352  001401                          BEQ     .+4               ;BR IF YES
035354  104005                          ERROR   5                 ;IBUS DATA ERROR
035356  005202                          INC     R2                ;NEXT IBUS REGISTER
035360  022702  000010                  CMP     #10,R2            ;DONE YET?
035364  001352                          BNE     14$               ;BR IF NO
035366  005002                          CLR     R2                ;R2 = SP ADDRESS
035370  042737  000017  035404  16$:    BIC     #17,17$ ;CLEAR ADRESS FIELD OF INSTRUCTION
035376  050237  035404                  BIS     R2,17$            ;ADD ADDRESS TO INSTRUCTION
035402  104412                          ROMCLK                    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035404  040600                  17$:    040600                    ;BR ← SP
035406  010205                          MOV     R2,R5             ;R5 = "EXPECTED"
035410  104412                          ROMCLK                    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035412  061224                          061224                    ;PORT4 ← BR
035414  016104  000004                  MOV     4(R1),R4          ;R4 = "FOUND"
035420  120504                          CMPB    R5,R4             ;SP CONTENTS OK?
035422  001401                          BEQ     .+4               ;BR IF YES
035424  104007                          ERROR   7                 ;SP DATA ERROR
035426  005202                          INC     R2                ;NEXT SP LOCATION
035430  022702  000020                  CMP     #20,R2            ;DONE YET?
035434  001355                          BNE     16$               ;BR IF NO
035436  005002                          CLR     R2                ;R2 = MEMORY ADDRESS
035440  104412                          ROMCLK                    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035442  010000                          010000                    ;MAR ← 0
035444  104412                          ROMCLK                    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035446  004000                          4000                      ;MAR HI ← 0 (KMC ONLY)
035450  010205                  18$:    MOV     R2,R5             ;R5 = "EXPECTED"
035452  104412                          ROMCLK                    ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035454  055224                          055224                    ;PORT4 ← MAIN MEM
035456  016104  000004                  MOV     4(R1),R4          ;R4 = "FOUND"
035462  120504                          CMPB    R5,R4             ;MAIN MEM CONTENTS OK?
035464  001401                          BEQ     .+4               ;BR IF YES
035466  104013                          ERROR   13                ;MAIN MEM DATA ERROR
035470  005202                          INC     R2                ;NEXT MEM ADDRESS
035472  022702  001000          CMP     #1000,R2                  ;DONE YET?
035476  001364                          BNE     18$               ;BR IF NO
035500  104420                          ADVANCE                   ; ADVANCE LOOP
```

```
035502     000     002     003  30$:     .BYTE   0,2,3,5,10
035505     005     010
        035510                  .EVEN
035510     001     003     004  31$:     .BYTE   1,3,4,6,10
035513     006     010
        035516                  .EVEN


                                ;SUBROUTINES
                                ;-----------

035516                          SETVEC:
                                         ;THIS SUBROUTINE LOADS THE VECTORS AND VECTOR LEVELS

035516  012577  144334                   MOV     (R5)+,@KMRVEC    ;LOAD BASE VECTOR
035522  012577  144334                   MOV     (R5)+,@KMTVEC    ;LOAD VECTOR + 2
035526  112577  144326                   MOVB    (R5)+,@KMRLVL    ;LOAD VECTOR + 4
035532  112577  144326                   MOVB    (R5)+,@KMTLVL    ;LOAD VECTOR + 6
035536  000205                           RTS     R5               ;RETURN


035540                          NPRSET:
                                         ;THIS SUBROUTINE LOADS IBUS REGISTERS 0-7
                                         ;WITH NPR INFORMATION (INBA, OUTBA, OUT DATA)

035540  010246                           MOV     R2,-(SP)         ;SAVE R2
035542  005002                           CLR     R2               ;START AT IBUS REG 0
035544  112561  000004          1$:      MOVB    (R5)+,4(R1)      ;LOAD PORT4
035550  042737  000017  035564           BIC     #17,2$           ;CLEAR ADDRESS FIELD OF INSTRUCTION
035556  050237  035564                   BIS     R2,2$            ;ADD ADDRESS TO INSTRUCTION
035562  104412                           ROMCLK                   ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035564  122100                  2$:      122100                   ;MOVE PORT4 TO IBUS REG
035566  005202                           INC     R2               ;NEXT ADDRESS
035570  022702  000010                   CMP     #10,R2           ;ALL DONE?
035574  001363                           BNE     1$               ;BR IF NO
035576  012602                           MOV     (SP)+,R2         ;RESTORE R2
035600  000205                           RTS     R5               ;RETURN


035602                          MEMLD:
                                         ;THIS SUBROUTINE LOADS THE FIRST 8 LOCATIONS OF MAIN
                                         ;MEMORY WITH THIS DATA: 0,-1,,0,-1,125,252,125,252

035602  013605                           MOV     @(SP)+,R5        ;PUT POINTER TO DATA IN R5
035604  062746  000002                   ADD     #2,-(SP)         ;ADJUST STACK
035610  012704  000010                   MOV     #10,R4           ;DO 8 LOADS
035614  104412                           ROMCLK                   ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035616  010000                           010000                   ;MAR < 0
035620  112577  144250          1$:      MOVB    (R5)+,@KMP04     ;LOAD PORT4
035624  104412                           ROMCLK                   ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035626  136500                           136500                   ;MOV DATA TO MEM, AUTO INC MAR
035630  005304                           DEC     R4               ;DECREMENT COUNT
035632  001372                           BNE     1$               ;BR IF NOT DONE
035634  000207                           RTS     PC               ;RETURN


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```
035636                           SPLD:
                                          ;THIS SUBROUTINE LOADS THE FIRST 8 SCRATCH PAD
                                          ;LOCATIONS WITH: 0,0,-1,-1,125,125,252,252

035636  013605                            MOV     @(SP)+,R5           ;PUT POINTER TO DATA IN R5
035640  062746  000002                    ADD     #2,-(SP)            ;ADJUST STACK
035644  005004                            CLR     R4                  ;START AT SP ADDRESS 0
035646  112577  144222           1$:      MOVB    (R5)+,@KMPO4        ;LOAD PORT4 WITH DATA
035652  042737  000017  035666            BIC     #17,2$              ;CLEAR ADDRESS FIELD OF INSTRUCTION
035660  050437  035666                    BIS     R4,2$               ;ADD ADDRESS TO INSTRUCTION
035664  104412                            ROMCLK                      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035666  123100                   2$:      123100                      ;MOVE DATA TO SP
035670  005204                            INC     R4                  ;INCREMENT COUNT
035672  022704  000010                    CMP     #10,R4              ;DONE YET?
035676  001363                            BNE     1$                  ;BR IF NO
035700  000207                            RTS     PC                  ;RETURN


035702                           CLRC:
                                          ;THIS SUBROUTINE CLEARS THE MICRO PROCESSOR C BIT

035702  104412                            ROMCLK                      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035704  010000                            010000                      ;MAR←0
035706  104412                            ROMCLK                      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035710  040400                            040400!<0*20>               ;CLEAR C BIT
035712  000207                            RTS     PC                  ;RETURN


035714                           SETC:
                                          ;THIS SUBROUTINE SETS THE MICRO PROCESSOR C BIT

035714  104412                            ROMCLK                      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035716  010003                            010003                      ;MAR←3
035720  104412                            ROMCLK                      ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
035722  040403                            040403!<0*20>               ;SET C BIT
035724  000207                            RTS     PC                  ;RETURN


035726     000     377     000   MEMDAT:  .BYTE   0,-1,0,-1,125,252,125,252
035731     377     125     252
035734     125     252
035736     000     000     377   SPDAT:   .BYTE   0,0,-1,-1,125,125,252,252
035741     377     125     125
035744     252     252
                                 .EVEN
035746  052600  044516  052502   EM1:     .ASCIZ  <200>/UNIBUS REGISTER ADDRESSING TIME-OUT/
036013     200  047125  041111   EM2:     .ASCIZ  <200>↑UNIBUS REGISTER WRITE/READ TEST↑
036054  046600  041511  047522   EM3:     .ASCIZ  <200>/MICRO PROCESSOR TEST/
036102  046600  041511  047522   EM4:     .ASCIZ  <200>↑MICRO PROCESSOR WRITE/READ TEST↑
036143     200  051102  051040   EM5:     .ASCIZ  <200>/BR REGISTER TEST/
036165     200  041523  040522   EM6:     .ASCIZ  <200>/SCRATCH PAD TEST/
036207     200  042504  044526   EM7:     .ASCIZ  <200>/DEVICE FAILED TO INTERRUPT/
036243     200  042504  044526   EM10:    .ASCIZ  <200>/DEVICE INTERRUPTED TO WRONG VECTOR/
036307     200  050116  020122   EM11:    .ASCIZ  <200>/NPR TEST/
036321     200  040515  047111   EM12:    .ASCIZ  <200>/MAIN MEMORY TEST/
036343     200  040515  020122   EM13:    .ASCIZ  <200>/MAR TEST/
```

```
036355     200  046101  020125  EM14:   .ASCIZ  <200>/ALU TEST/
036367     200  051120  043517  EM15:   .ASCIZ  <200>/PROGRAM CLOCK TEST/
036413     200  047506  041522  EM16:   .ASCIZ  <200>/FORCE POWER FAIL ERROR/
036443     200  047125  054105  EM17:   .ASCIZ  <200>/UNEXPECTED INTERRUPT/
036471     200  046513  030503  EM20:   .ASCIZ  <200>/KMC11 CONFIGURATION ERROR/
036524  046600  044501  052116  EM21:   .ASCIZ  <200>/MAINTENANCE INSTRUCTION REGISTER TEST/
036573     200  047520  042527  EM22:   .ASCIZ  <200>/POWER FAIL INITIALIZE FAILURE/

036632  051200  043505  051511  DH1:    .ASCIZ  <200>/REGISTER                TRAPPED FROM/
036673     200  054105  042520  DH2:    .ASCIZ  <200>/EXPECTED  FOUND      REGISTER/
036731     200  054105  042520  DH3:    .ASCIZ  <200>/EXPECTED  FOUND/
036752  042600  050130  041505  DH4:    .ASCIZ  <200>/EXPECTED  FOUND   IBUS* REGISTER/
037014  042600  050130  041505  DH5:    .ASCIZ  <200>/EXPECTED  FOUND   IBUS REGISTER/
037055     200  054105  042520  DH6:    .ASCIZ  <200>/EXPECTED  FOUND      ADDRESS/
                                .EVEN

037112  000002                  DT1:    2
037114     006     015                  .BYTE   6,15
037116  001264                          $REG1
037120     006     002                  .BYTE   6,2
037122  001266                          $REG2
037124  000003                  DT2:    3
037126     006     004                  .BYTE   6,4
037130  001274                          $REG5
037132     006     004                  .BYTE   6,4
037134  001272                          $REG4
037136     006     002                  .BYTE   6,2
037140  001264                          $REG1
037142  000002                  DT3:    2
037144     006     004                  .BYTE   6,4
037146  001274                          $REG5
037150     006     002                  .BYTE   6,2
037152  001272                          $REG4
037154  000003                  DT4:    3
037156     003     007                  .BYTE   3,7
037160  001274                          $REG5
037162     003     011                  .BYTE   3,11
037164  001272                          $REG4
037166     002     002                  .BYTE   2,2
037170  001266                          $REG2
037172  000003                  DT5:    3
037174     003     007                  .BYTE   3,7
037176  001274                          $REG5
037200     003     007                  .BYTE   3,7
037202  001272                          $REG4
037204     006     002                  .BYTE   6,2
037206  001266                          $REG2
037210  000002                  DT6:    2
037212     003     007                  .BYTE   3,7
037214  001274                          $REG5
037216     003     002                  .BYTE   3,2
037220  001272                          $REG4
037222  000002                  DT7:    2
037224     006     004                  .BYTE   6,4
037226  001264                          $REG1
037230     006     002                  .BYTE   6,2
```

```
        037232  002066                            KMCSR
        037234                          CORMAX:
                000001                  .END
```

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DZKCC    MACY11 27(1006)  12-MAY-77  18:34  PAGE 126                                                    PAGE:  0151
DZKCC.P11     21-MAR-77 17:19          CROSS REFERENCE TABLE -- USER SYMBOLS

ABASE  = 000000          266     307
ACDW1  = 000000          266     309
ACDW2  = 000000          266     310
ACPUOP= 000000           266     281
ADDW0  = 000000          266     311
ADDW1  = 000000          266     312
ADDW10= 000000           266     321
ADDW11= 000000           266     322
ADDW12= 000000           266     323
ADDW13= 000000           266     324
ADDW14= 000000           266     325
ADDW15= 000000           266     326
ADDW2  = 000000          266     313
ADDW3  = 000000          266     314
ADDW4  = 000000          266     315
ADDW5  = 000000          266     316
ADDW6  = 000000          266     317
ADDW7  = 000000          266     318
ADDW8  = 000000          266     319
ADDW9  = 000000          266     320
ADEVCT= 000000           266     272
ADEVM  = 000000          266     308
ADRCNT   006057         1371*   1386*   1395#
ADVANC= 104420          1540#   2250    4173    4216    4254    4292    4326    4536    4579    4630    4681    4732    4783
                        4834    4885    4936    4987    5038    5089    5140    5191    5242    5293    5344    5395    5446
                        5497    5548    5599    5650    5701    5752    5803    5854    5905    5956    6007    6058    6109
                        6160    6211    6470
AENV   = 000002            1#    266     277
AENVM  = 000000          266     278
AFATAL= 000000           266     269
AMADR1= 000000           266     294
AMADR2= 000000           266     298
AMADR3= 000000           266     301
AMADR4= 000000           266     304
AMAMS1= 000000           266     288
AMAMS2= 000000           266     296
AMAMS3= 000000           266     299
AMAMS4= 000000           266     302
AMSGAD= 000000           266     274
AMSGLG= 000000           266     275
AMSGTY= 000000           266     268
AMTYP1= 000000           266     289
AMTYP2= 000000           266     297
AMTYP3= 000000           266     300
AMTYP4= 000000           266     303
APASS  = 000000          266     271
APRIOR= 000000           266
APTCSU= 000040          1096    1201#
APTENV= 000001          1089    1157    1199#   1601
APTSIZ= 000200          1198#
APTSPO= 000100          1091    1159    1200#
APT.SI   013510          764    2175#
ASWREG= 000000           266     279
ATESTN= 000000           266     270
AUDONE   003354          801     822     861#
AUNIT  = 000000          266     273
```

J12

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DZKCC   MACY11 27(1006)  12-MAY-77  18:34  PAGE 127                                                          PAGE:  0152
DZKCC.P11     21-MAR-77 17:19            CROSS REFERENCE TABLE -- USER SYMBOLS

AUSTRT   003126            800#
AUSWR  = 000000            266     280
AUTO.S   012110            762    1919#
AVECT1=  000000            266     305
AVECT2=  000000            266     306
BASE     013726           2186*   2197    2211*   2221#
BINWRD   006412           1443*   1446*   1447    1484#
BIT0   = 000001            129#   1708    1709    2333    2341    2621    2629    4505    6247    6249    6250
BIT00  = 000001            119#    129
BIT01  = 000002            118#    128
BIT02  = 000004            117#    127
BIT03  = 000010            116#    126
BIT04  = 000020            115#    125
BIT05  = 000040            114#    124
BIT06  = 000100            113#    123
BIT07  = 000200            112#    122
BIT08  = 000400            111#    121
BIT09  = 001000            110#    120
BIT1   = 000002            128#    769    1702    1708    1709    2056    2365    2373    2653    2661    6245    6247    6249
                          6250
BIT10  = 002000            109#   2037    2976    2995    3018    3037    4357    4395    6307
BIT11  = 004000            108#   1032    2557    2565
BIT12  = 010000            107#   1991    2054    2589    2597    2781    2789
BIT13  = 020000            106#   1994    2040    2058    2813    2821
BIT14  = 040000            105#   1014    2005    2007    2058    2069    3036
BIT15  = 100000            104#    709
BIT2   = 000004            127#    769     910    1709    2397    2405    2685    2693
BIT3   = 000010            126#   2060    2067
BIT4   = 000020            125#   1692    1715    1717
BIT5   = 000040            124#   2172    2429    2437
BIT6   = 000100            123#   1697    1698    2062    2461    2469    2717    2725
BIT7   = 000200            122#   1698    1817    2172    2493    2501    2749    2757
BIT8   = 000400            121#   2049    2051    2064    2066    2072    2075    2132    3064    4358    4396    6290
BIT9   = 001000            120#   2046    2072    2075    2130    2132    2525    2533    2976    2995    3018    3037    3062
                          3064    4357    4395    6288    6290    6307
BM       010631           1740#   2018
BPTVEC=  000014            136#
BRLVL    013442           2127    2137    2145    2158#
BRW      004360            915    1049#
CHRCNT   006410           1441*   1444    1448    1464*   1482#   1483
CKSWR    011212            740    1055    1547    1765#
CKSWR1   011266           1777#   1789
CKSWR2   011300           1780#
CKSWR3   011304           1782#
CKSWR4   011310           1783#   1791    1798
CKSWR5   011414           1766    1768    1772    1807#
CLKX     001452            341#
CLRC     035702           4609    4660    4711    4762    4813    4864    4915    4966    5017    5068    5119    5170    5221
                          5272    5323    5374    6545#
CNERR    011027            834    1740#
CNT.MA   002302            355     589#    708     710     712    1845
CNVRT  = 104417            831     940     942     944     946    1539#   1582    1584    1659    1780
CONERR   010762            829    1740#
CONN     010671           1740#   1996
CONTAB   003330            838     846#
CONVRT=  104416            781     837    1538#   1598    1941
```

K12

```
CORMAX  037234          4501    4533    6572#
CR    = 000015            44#   1135    1145
CREAM   001502           354#    707*   1841*   1842    1844*   1848
CRLF  = 000200            45#   1106    1145
CSR     010363          1740#   1945
CSRMAP  012112          1921#
CYCLE   011460           916     977    1832#
DATABP  006764          1571*   1574    1596    1599#
DATACL= 104413          1535#
DATAHD  006752          1570*   1592    1595#
DDISP = 177570            51#    207#    236
DELAY = 104411          1533#
DEVTAB  003342           804     851#
DH1     036632           386    6572#
DH2     036673           389    6572#
DH3     036731           392     401     413     422     437     440     446    6572#
DH4     036752           395     425    6572#
DH5     037014           398    6572#
DH6     037055           404     416     419     434    6572#
DISPLA  001242           236#    726*    732*   1044*
DISPRE  000174           197#    732
DSWR  = 177570            50#    206#    235
DT1     037112           387    6572#
DT2     037124           390    6572#
DT3     037142           393     414     441     447    6572#
DT4     037154           396     426    6572#
DT5     037172           399     405     417     420     435    6572#
DT6     037210           402     423    6572#
DT7     037222           438    6572#
DZDME = ****** U         382
DZDMG = ****** U         382
EMTVEC= 000030           139#
EM1     035746           385    6572#
EM10    036243           409    6572#
EM11    036307           412     433    6572#
EM12    036321           415    6572#
EM13    036343           418    6572#
EM14    036355           421    6572#
EM15    036367           424    6572#
EM16    036413           427    6572#
EM17    036443           430    6572#
EM2     036013           388    6572#
EM20    036471           436     442    6572#
EM21    036524           439    6572#
EM22    036573           445    6572#
EM3     036054           391    6572#
EM4     036102           394     397    6572#
EM5     036143           400    6572#
EM6     036165           403    6572#
EM7     036207           406    6572#
ERCT00  002304           591#
ERCT01  002310           594#
ERCT02  002314           597#
ERCT03  002320           600#
ERCT04  002324           603#
ERCT05  002330           606#
```

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DZKCC    MACY11 27(1006)  12-MAY-77  18:34  PAGE 129                                                     PAGE:  0154
DZKCC.P11     21-MAR-77 17:19             CROSS REFERENCE TABLE -- USER SYMBOLS

ERCT06   002334            609#
ERCT07   002340            612#
ERCT10   002344            615#
ERCT11   002350            618#
ERCT12   002354            621#
ERCT13   002360            624#
ERCT14   002364            627#
ERCT15   002370            630#
ERCT16   002374            633#
ERCT17   002400            636#
ERR      003244            813     826#    830
ERRMSG   006740           1569*   1587    1590#
ERRPC    003322            832     843#
ERRVEC=  000004            132#   1019    1020*   1022*   1025*
ERTAB0   007112           1584    1624#
EXIT   = 000205            159#
EXITER   007046           1610    1615#
FLOAT    003156            806#    812
FY       003202            814#    818     823
GNS    = ****** U         1523    1526    1527    1528    1529    1530    1531    1532    1533    1534    1535    1536    1537
                          1538    1539    1540
HALTS    006770           1554    1601#
HILIM    006052           1368*   1376    1392#
HT     = 000011             42#   1104    1145
INCHAR   011420           1783    1811#
INIFLG   001506            359#    735     765     772*
INLP1    005766           1373#   1382
INPUT  = 104415           1537#   1881    1932    1944    1952    2009    2017
INTTY    013456           1962    1981    1997    2166#
IOTVEC=  000020            137#
KMACTV   001470            348#    749     874*    875    1832    1846    1927*   2087*   2093*   2094*   2098    2123    2189*
                          2190
KMCM     011050            840    1740#
KMCR00   002100            504#
KMCR01   002110            509#
KMCR02   002120            514#
KMCR03   002130            519#
KMCR04   002140            524#
KMCR05   002150            529#
KMCR06   002160            534#
KMCR07   002170            539#
KMCR10   002200            544#
KMCR11   002210            549#
KMCR12   002220            554#
KMCR13   002230            559#
KMCR14   002240            564#
KMCR15   002250            569#
KMCR16   002260            574#
KMCR17   002270            579#
KMCSR    002066            487#    800*    815     821*    850     980    1047    1662    1716    1850*   1859    1907    2238
                          2303    2332    2364    2396    2428    2460    2492    2524    2556    2588    2946    6572
KMCSRH   002070            488#   1697*   1698*   1702*   1708*   1709*   1715*   1717*   1859*   1860*   1861
KMCTL    002072            489#   1861*   1862*   1863    2620    2652    2684    2716    2748    2780    2812
KMNUM    001472            349#    703     957    1925*   1939*   2079*   2080    2088    2090
KMP04    002074            490#   1686*   1692    1729    1734    1863*   1864*   1865    2844    4345    4346    4386    4387
                          6519*   6534*
```

M12

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DZKCC   MACY11 27(1006)  12-MAY-77  18:34  PAGE 130                                                      PAGE:  0155
DZKCC.P11    21-MAR-77 17:19            CROSS REFERENCE TABLE -- USER SYMBOLS

KMP06   002076           491#    1703*    1865*    1866*    2888
KMRLVL  002060           484#     950      951*    1868*    1869*    1870     6487*
KMRVEC  002056           483#     950*     983     1851*    1852*    1868     6485*
KMS100  002102           505#
KMS101  002112           510#
KMS102  002122           515#
KMS103  002132           520#
KMS104  002142           525#
KMS105  002152           530#
KMS106  002162           535#
KMS107  002172           540#
KMS110  002202           545#
KMS111  002212           550#
KMS112  002222           555#
KMS113  002232           560#
KMS114  002242           565#
KMS115  002252           570#
KMS116  002262           575#
KMS117  002272           580#
KMS200  002104           506#
KMS201  002114           511#
KMS202  002124           516#
KMS203  002134           521#
KMS204  002144           526#
KMS205  002154           531#
KMS206  002164           536#
KMS207  002174           541#
KMS210  002204           546#
KMS211  002214           551#
KMS212  002224           556#
KMS213  002234           561#
KMS214  002244           566#
KMS215  002254           571#
KMS216  002264           576#
KMS217  002274           581#
KMS300  002106           507#
KMS301  002116           512#
KMS302  002126           517#
KMS303  002136           522#
KMS304  002146           527#
KMS305  002156           532#
KMS306  002166           537#
KMS307  002176           542#
KMS310  002206           547#
KMS311  002216           552#
KMS312  002226           557#
KMS313  002236           562#
KMS314  002246           567#
KMS315  002256           572#
KMS316  002266           577#
KMS317  002276           582#
KMTLVL  002064           486#     952      953*    1872*    1873*    6488*
KMTVEC  002062           485#     952*    1870*    1871*    1872     6486*
KM.END  002300           584#    1923     2194
KM.MAP  002100           354      503#     707      774      784     1842     1844     1921     1926     2115     2192     2196
LF    = 000012            43#    1139     1145
```

N12

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DZKCC    MACY11 27(1006)  12-MAY-77  18:34  PAGE 131                                                                    PAGE:  0156
DZKCC.P11     21-MAR-77 17:19          CROSS REFERENCE TABLE -- USER SYMBOLS

LINE     010573           1740#   2010
LOBITS   006056           1370*   1394#
LOCK     001444            335#   1046*   1058    1060    1401*   1578    2236*   2287*   2305*   2330*   2340*   2362*   2372*
                          2394*   2404*   2426*   2436*   2458*   2468*   2490*   2500*   2522*   2532*   2554*   2564*   2586*
                          2596*   2618*   2628*   2650*   2660*   2682*   2692*   2714*   2724*   2746*   2756*   2778*   2788*
                          2810*   2820*   2842*   2857*   2886*   2901*   2930*   2948*   2973*   2984*   2992*   3015*   3026*
                          3034*   3086*   3108*   3143*   3165*   3200*   3220*   3253*   3273*   3306*   3328*   3363*   3386*
                          3422*   3442*   3475*   3495*   3528*   3548*   3581*   3601*   3634*   3654*   3687*   3707*   3740*
                          3760*   3793*   3813*   3846*   3875*   3909*   3928*   3961*   3986*   4028*   4055*   4557*   4600*
                          4651*   4702*   4753*   4804*   4855*   4906*   4957*   5008*   5059*   5110*   5161*   5212*   5263*
                          5314*   5365*   5416*   5467*   5518*   5569*   5620*   5671*   5722*   5773*   5824*   5875*   5926*
                          5977*   6028*   6079*   6130*   6181*
LOKFLG   001510            361#
LOLIM    006050           1367*   1378    1391#
MASKX    001454            342#
MASTEK   010015           1580    1740#
MCSRX    007745            939    1740#
MDATA    011150           1462    1472    1757#
MEMDAT   035726           4606    4657    4708    4759    4810    4861    4912    4963    5014    5065    5116    5167    5218
                          5269    5320    5371    5422    5473    5524    5575    5626    5677    5728    5779    5830    5881
                          5932    5983    6034    6085    6136    6187    6565#
MEMLD    035602           4560    4605    4656    4707    4758    4809    4860    4911    4962    5013    5064    5115    5166
                          5217    5268    5319    5370    5421    5472    5523    5574    5625    5676    5727    5778    5829
                          5890    5931    5982    6033    6084    6135    6186    6510#
MEMLIM   001466            347#    898*   4531
MEPASS   007620            938    1740#
MERRPC   010072           1583    1740#
MERRX    007772            945    1740#
MERR2    007645           1740#   2100
MERR3    007672            871    1740#
MILK     001504            355#    708*    947    1840*   1845*   1849
MLOCK    007716            91[illegible]    1740#
MNEW     010017            866    1740#
MODU     010461           1740#   1980
MPASSX   007761            943    1740#
MPFAIL   007562           1658    1675    1740#
MR       007642            919    1740#   1897
MRESET=  004000            159#
MSTCLR=  104410           1532#   1664    2289    2331    2363    2395    2427    2459    2491    2523    2555    2587    2619
                          2651    2683    2715    2747    2779    2811    2843    2887    2932    2975    3017    3060    3088
                          3145    3202    3255    3308    3365    3424    3477    3530    3583    3636    3689    3742    3795
                          3848    3911    3963    4030    4120    4151    4191    4271    4309    4344    4385    4423    4460
                          4498    4559    4602    4653    4704    4755    4806    4857    4908    4959    5010    5061    5112
                          5163    5214    5265    5316    5367    5418    5469    5520    5571    5622    5673    5724    5775
                          5826    5877    5928    5979    6030    6081    6132    6183    6232    6283    6333
MTITLE   001000            205#    739
MTSTN    010003           1581    1740#   1882
MVECX    007753            941    1740#
NEXT     001442            334#   1400    1620    2235*   2265*   2286*   2329*   2361*   2393*   2425*   2457*   2489*   2521*
                          2553*   2585*   2617*   2649*   2681*   2713*   2745*   2777*   2809*   2841*   2885*   2929*   2972*
                          3014*   3058*   3085*   3142*   3199*   3252*   3305*   3362*   3421*   3474*   3527*   3580*   3633*
                          3686*   3739*   3792*   3845*   3908*   3960*   4027*   4087*   4118*   4149*   4189*   4234*   4269*
                          4307*   4342*   4383*   4421*   4458*   4496*   4556*   4599*   4650*   4701*   4752*   4803*   4854*
                          4905*   4956*   5007*   5058*   5109*   5160*   5211*   5262*   5313*   5364*   5415*   5466*   5517*
                          5568*   5619*   5670*   5721*   5772*   5823*   5874*   5925*   5976*   6027*   6078*   6129*   6180*
                          6230*   6281*   6331*
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DZKCC    MACY11 27(1006)  12-MAY-77  18:34  PAGE 132                                                          PAGE:  0157
DZKCC.P11    21-MAR-77 17:19            CROSS REFERENCE TABLE -- USER SYMBOLS

NOACT    010731              751     1740#    1834
NODEV    003240              802      824#
NPRSET   035540             4239     4273     4311     4347     4388     4424     4461     4508     6492#
NUM      010323             1740#    1933
OK       003220              816      819#     842
ONE      001464              346#
PACT00   002302              590#
PACT01   002306              593#
PACT02   002312              596#
PACT03   002316              599#
PACT04   002322              602#
PACT05   002326              605#
PACT06   002332              608#
PACT07   002336              611#
PACT10   002342              614#
PACT11   002346              617#
PACT12   002352              620#
PACT13   002356              623#
PACT14   002362              626#
PACT15   002366              629#
PACT16   002372              632#
PACT17   002376              635#
PARBIT=  040000              159#
PERFOR=  004537              159#
PFTAB    007324             1659     1681#
PIRQ   = 177772               49#
PIRQVE=  000240              143#
POPR0  = 012600              154#    1614
POP1SP=  005726              152#
POP2SP=  022626              156#    6300
PRIO     010422             1740#    1961
PRIRTY   013730             2182*    2188*    2201     2222#
PR0    = 000000               66#    2158     2159
PR1    = 000040               67#
PR2    = 000100               68#
PR3    = 000140               69#
PR4    = 000200               70#    2160
PR5    = 000240               71#    2161
PR6    = 000300               72#    2162
PR7    = 000340               73#     178      180      182      184     2163
PS     = 177776               46#      47      700*     909*    2127*    2137*    4095*    4099*    4125*    4129*    4153*    4167*    4193*
                            4209*
PSW    = 177776               47#
PUSHR0=  010046              153#    1611
PUSH1S=  005746              151#
PUSH2S=  024646              155#
PWRVEC=  000024              138#    1637*    1638*    1647*    1653*    1672*    1673*
QV.FLG   001511              362#     706*     956*
RDCHR  = 104402             1253     1526#
RDLIN  = 104403             1326     1527#
RDOCT  = 104404             1375     1528#
RESREG   006766             1597     1600#
RESVEC=  000010              133#
RES05  = 104407             1531#    1600
ROMCLK=  104412             1534#    1687     1690     1727     1732     3094     3096     3114     3116     3151     3153     3171     3173
                            3207     3209     3225     3227     3260     3262     3278     3280     3314     3316     3334     3336     3371
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C13

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DZKCC    MACY11 27(1006)  12-MAY-77  18:34  PAGE 133                                                     PAGE:  0158
DZKCC.P11     21-MAR-77 17:19              CROSS REFERENCE TABLE -- USER SYMBOLS

                         3373     3392     3394     3429     3431     3447     3449     3482     3484     3500     3502     3535     3537
                         3553     3555     3588     3590     3606     3608     3641     3643     3659     3661     3694     3696     3712
                         3714     3747     3749     3765     3767     3800     3802     3818     3820     3855     3863     3881     3915
                         3917     3933     3935     3969     3973     3975     3992     3996     3998     4037     4041     4043     4061
                         4063     4097     4127     4165     4207     4246     4280     4284     4286     4318     4353     4361     4363
                         4399     4401     4430     4433     4436     4467     4470     4473     4515     4565     4567     4569     4571
                         4612     4616     4618     4663     4667     4669     4714     4718     4720     4765     4769     4771     4816
                         4820     4822     4867     4871     4873     4918     4922     4924     4969     4973     4975     5020     5024
                         5026     5071     5075     5077     5122     5126     5128     5173     5177     5179     5224     5228     5230
                         5275     5279     5281     5326     5330     5332     5377     5381     5383     5428     5432     5434     5479
                         5483     5485     5530     5534     5536     5581     5585     5587     5632     5636     5638     5683     5687
                         5689     5734     5738     5740     5785     5789     5791     5836     5840     5842     5887     5891     5893
                         5938     5942     5944     5989     5993     5995     6040     6044     6046     6091     6095     6097     6142
                         6146     6148     6193     6197     6199     6236     6257     6338     6351     6354     6357     6370     6373
                         6376     6382     6385     6388     6391     6399     6401     6413     6431     6443     6446     6456     6458
                         6461     6501     6517     6520     6537     6548     6550     6558     6560
RUN        001500         352#     709*    1838*    1839*    1846
SAVACT     001474         350#     869     2098*    2190*
SAVNUM     001476         351#     703*     954*     957*    2091*    2184*
SAVPC      001460         344#     830*     845     1407*    1626
SAVSP      001456         343#
SAVOS  =   104406        1530#    1559
SCOP1  =   104405        1529#    2244     2298     2311     2339     2346     2371     2378     2403     2410     2435     2442     2467
                         2474     2499     2506     2531     2538     2563     2570     2595     2602     2627     2634     2659     2666
                         2691     2698     2723     2730     2755     2762     2787     2794     2819     2826     2853     2867     2897
                         2911     2941     2954     2983     2991     3000     3025     3033     3042     3104     3124     3161     3181
                         3216     3234     3269     3287     3324     3344     3382     3403     3438     3456     3491     3509     3544
                         3562     3597     3615     3650     3668     3703     3721     3756     3774     3809     3827     3870     3888
                         3924     3942     3982     4005     4050     4070     4523     4578     4625     4676     4727     4778     4829
                         4880     4931     4982     5033     5084     5135     5186     5237     5288     5339     5390     5441     5492
                         5543     5594     5645     5696     5747     5798     5849     5900     5951     6002     6053     6104     6155
                         6206
SETC       035714        5425     5476     5527     5578     5629     5680     5731     5782     5833     5884     5935     5986     6037
                         6088     6139     6190     6555#
SETVEC     035516        4091     4121     4160     4202     6482#
SOFTSW     011452        1781     1820#
SPACNT=    006411        1442*    1466     1469*    1483#
SPDAT      035736        4608     4659     4710     4761     4812     4863     4914     4965     5016     5067     5118     5169     5220
                         5271     5322     5373     5424     5475     5526     5577     5628     5679     5730     5781     5832     5883
                         5934     5985     6036     6087     6138     6189     6568#
SPLD       035636        4562     4607     4658     4709     4760     4811     4862     4913     4964     5015     5066     5117     5168
                         5219     5270     5321     5372     5423     5474     5525     5576     5627     5678     5729     5780     5831
                         5882     5933     5984     6035     6086     6137     6188     6527#
STACK  =   001200          37#     701      888     1621     4104     4134     6306
STAT       001450         340#
STAT1      002050         476#    1853*    4154     4194
STAT2      002052         477#    1854*
STAT3      002054         478#    1855*
STKLMT=    177774          48#
STRTSW     001446         339#     741*     744*     745      747      761*     767      769      864      910      917     1875     1898*
                         1928     2111
SVOS       006100        1411#
SWFLG      011416         704*    1776*    1803*    1809#
SWR        001240         235#     725*     727      731*     741      869      874     1014     1032     1056     1548     1553     1609
                         1616     1618     1645     1665*    1705     1765     1802*
SWREG      000176         198#     720*     731     1765     1822
```

```
SW0    = 000001           101#
SW00   = 000001            91#      101      745      761     1928     2111
SW01   = 000002            90#      100      917     1875     1898
SW02   = 000004            89#       99
SW03   = 000010            88#       98      864
SW04   = 000020            87#       97
SW05   = 000040            86#       96
SW06   = 000100            85#       95     1705
SW07   = 000200            84#       94
SW08   = 000400            83#       93     1616
SW09   = 001000            82#       92     1056
SW1    = 000002           100#
SW10   = 002000            81#     1618
SW11   = 004000            80#
SW12   = 010000            79#     1548
SW13   = 020000            78#     1553
SW14   = 040000            77#
SW15   = 100000            76#
SW2    = 000004            99#
SW3    = 000010            98#
SW4    = 000020            97#
SW5    = 000040            96#
SW6    = 000100            95#
SW7    = 000200            94#
SW8    = 000400            93#
SW9    = 001000            92#
TBITVE= 000014            134#
TDATA    025350          4561     4563     4580#
TEMP     011106          1449     1713*    1718*    1724*    1736*    1755#    6233*    6261*    6284*    6291*
TIMER  = 104414          1536#
TKVEC  = 000060           141#
TLAST  = 034660          1901     6572#
TPVEC  = 000064           142#
TRAPVE= 000034            140#
TRTVEC= 000014            135#
TST1     013732          1008     1888     1906     2233#
TST10    014612          2425     2455#
TST100   026762          4905     4954#
TST101   027140          4956     5005#
TST102   027316          5007     5056#
TST103   027474          5058     5107#
TST104   027652          5109     5158#
TST105   030030          5160     5209#
TST106   030206          5211     5260#
TST107   030364          5262     5311#
TST11    014710          2457     2487#
TST110   030542          5313     5362#
TST111   030720          5364     5413#
TST112   031076          5415     5464#
TST113   031254          5466     5515#
TST114   031432          5517     5566#
TST115   031610          5568     5617#
TST116   031766          5619     5668#
TST117   032144          5670     5719#
TST12    015006          2489     2519#
TST120   032322          5721     5770#
```

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TST121   032500        5772     5821#
TST122   032656        5823     5872#
TST123   033034        5874     5923#
TST124   033212        5925     5974#
TST125   033370        5976     6025#
TST126   033546        6027     6076#
TST127   033724        6078     6127#
TST13    015104        2521     2551#
TST130   034102        6129     6178#
TST131   034260        6180     6228#
TST132   034466        6230     6279#
TST133   034660        6281     6329#    6572
TST134=  ****** U      6331
TST14    015202        2553     2583#
TST15    015300        2585     2615#
TST16    015376        2617     2647#
TST17    015474        2649     2679#
TST2     014042        2235     2263#
TST20    015572        2681     2711#
TST21    015670        2713     2743#
TST22    015766        2745     2775#
TST23    016064        2777     2807#
TST24    016162        2809     2839#
TST25    016306        2841     2883#
TST26    016432        2885     2927#
TST27    016562        2929     2970#
TST3     014072        2265     2284#
TST30    016722        2972     3012#
TST31    017064        3014     3056#
TST32    017150        3058     3083#
TST33    017350        3085     3140#
TST34    017550        3142     3197#
TST35    017724        3199     3250#
TST36    020100        3252     3303#
TST37    020300        3305     3360#
TST4     014222        2286     2327#
TST40    020510        3362     3419#
TST41    020664        3421     3472#
TST42    021040        3474     3525#
TST43    021214        3527     3578#
TST44    021370        3580     3631#
TST45    021544        3633     3684#
TST46    021720        3686     3737#
TST47    022074        3739     3790#
TST5     014320        2329     2359#
TST50    022250        3792     3843#
TST51    022476        3845     3906#
TST52    022646        3908     3958#
TST53    023114        3960     4025#
TST54    023336        4027     4085#
TST55    023432        4087     4116#
TST56    023524        4118     4147#
TST57    023646        4149     4187#
TST6     014416        2361     2391#
TST60    024014        4189     4232#
TST61    024122        4234     4267#
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DZKCC    MACY11 27(1006)  12-MAY-77  18:34  PAGE 136                                                          PAGE:  0161
DZKCC.P11     21-MAR-77 17:19              CROSS REFERENCE TABLE -- USER SYMBOLS

TST62    024240               4269    4305#
TST63    024344               4307    4340#
TST64    024502               4342    4381#
TST65    024626               4383    4419#
TST66    024736               4421    4456#
TST67    025044               4458    4493#
TST7     014514               2393    2423#
TST70    025244               4496    4554#
TST71    025360               4556    4597#
TST72    025536               4599    4648#
TST73    025714               4650    4699#
TST74    026072               4701    4750#
TST75    026250               4752    4801#
TST76    026426               4803    4852#
TST77    026604               4854    4903#
TTST     004146                913*    915*   1010#
TWOSYN=  010000                159#
TYPDAT   006754               1575    1593    1596#
TYPE   = 104401                739     751     773     828     833     839     866     871     912     919     938     939     941
                               943     945    1109    1260    1266    1271    1275    1280    1281    1283    1286    1290    1355
                              1357    1373    1380    1381    1432    1472    1523#   1576    1577    1580    1581    1583    1585
                              1589    1594    1658    1674    1779    1782    1834    1880    1897    1903    1940    1960    1974
                              1979    1988    1995    2002    2100
TYPMSG   006654               1573    1576#
VEC      010401               1740#   1953
VECMAP   013172               2099    2111#
VECTR    013724               2181*   2187*   2206    2212*   2220#
WHAT     005770               1366*   1374#
WHERE    006054               1369*   1383    1393#
WHICH    013164               1942    2107#
WRDCNT   006406               1440*   1473*   1481#
WRKO.F   006742               1588    1591#
XBX      006542               1549    1551    1553#
XCSR     004104                940     978#
XERR     004126                946     987#
XHEAD    010077                773    1740#
XPASS    004120                944     984#
XSTATQ   011060                782    1740#
XTSTN    007120               1582    1627#
XVEC     004112                942     981#
ZERO     001462                345#
$APTHD   002034                458     464#
$ASTAT=  ****** U             1179    1194
$ATYC    004722               1150    1152#
$ATY1    004676               1148#
$ATY3    004704               1094    1149#
$ATY4    004714               1151#   1604
$AUTOB   001234                232#
$BASE    001372                307#   2186
$BDADR   001222                227#
$BDDAT   001226                229#
$CDW1    001376                309#   2183
$CDW2    001400                310#
$CHARC   004672               1111*   1121*   1128    1137*   1142#
$CKSWR=  ****** U             1526
$CMTAG   001200                215#
```

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DZKCC    MACY11 27(1006)  12-MAY-77  18:34  PAGE 137                                                    PAGE:  0162
DZKCC.P11     21-MAR-77 17:19           CROSS REFERENCE TABLE -- USER SYMBOLS

$CM1   = 000006            247#    248#    249#    250#    251#    252#    253#
$CM2   = 000014            247#    248#    249#    250#    251#    252#    253#
$CM3   = 000006            245#    247
$CM4   = 000005            253#    254#    255#    256#    257#    258#
$CNTLG   005534           1301#
$CNTLU   005527           1275    1300#
$COD   = ****** U            1
$CPUOP   001344            281#
$CRAP  = 177777              1#   2223#   2226    2228#   2254#   2257    2258#   2273#   2276    2279#   2316#   2319    2322#
                          2348#   2351    2354#   2380#   2383    2386#   2412#   2415    2418#   2444#   2447    2450#   2476#
                          2479    2482#   2508#   2511    2514#   2540#   2543    2546#   2572#   2575    2578#   2604#   2607
                          2610#   2636#   2639    2642#   2668#   2671    2674#   2700#   2703    2706#   2732#   2735    2738#
                          2764#   2767    2770#   2796#   2799    2802#   2828#   2831    2834#   2872#   2875    2878#   2916#
                          2919    2922#   2959#   2962    2965#   3001#   3004    3007#   3043#   3046    3051#   3072#   3075
                          3078#   3129#   3132    3135#   3186#   3189    3192#   3239#   3242    3245#   3292#   3295    3298#
                          3349#   3352    3355#   3408#   3411    3414#   3461#   3464    3467#   3514#   3517    3520#   3567#
                          3570    3573#   3620#   3623    3626#   3673#   3676    3679#   3726#   3729    3732#   3779#   3782
                          3785#   3832#   3835    3838#   3895#   3898    3901#   3947#   3950    3953#   4014#   4017    4020#
                          4075#   4078    4080#   4106#   4109    4111#   4136#   4139    4142#   4176#   4179    4182#   4222#
                          4225    4227#   4257#   4260    4262#   4295#   4298    4300#   4329#   4332    4335#   4370#   4373
                          4376#   4408#   4411    4414#   4445#   4448    4451#   4482#   4485    4488#   4544#   4547    4549#
                          4584#   4587    4592#   4635#   4638    4643#   4686#   4689    4694#   4737#   4740    4745#   4788#
                          4791    4796#   4839#   4842    4847#   4890#   4893    4898#   4941#   4944    4949#   4992#   4995
                          5000#   5043#   5046    5051#   5094#   5097    5102#   5145#   5148    5153#   5196#   5199    5204#
                          5247#   5250    5255#   5298#   5301    5306#   5349#   5352    5357#   5400#   5403    5408#   5451#
                          5454    5459#   5502#   5505    5510#   5553#   5556    5561#   5604#   5607    5612#   5655#   5658
                          5663#   5706#   5709    5714#   5757#   5760    5765#   5808#   5811    5816#   5859#   5862    5867#
                          5910#   5913    5918#   5961#   5964    5969#   6012#   6015    6020#   6063#   6066    6071#   6114#
                          6117    6122#   6165#   6168    6173#   6216#   6219    6223#   6267#   6270    6274#   6315#   6318
                          6324#
$CRLF    001313            260#   1110    1145    1280    1300    1360    1381    1432    1576    1577    1585    1880    1940
$DDW0    001402            311#   2191
$DDW1    001404            312#
$DDW10   001426            321#
$DDW11   001430            322#
$DDW12   001432            323#
$DDW13   001434            324#
$DDW14   001436            325#
$DDW15   001440            326#
$DDW2    001406            313#
$DDW3    001410            314#
$DDW4    001412            315#
$DDW5    001414            316#
$DDW6    001416            317#
$DDW7    001420            318#
$DDW8    001422            319#
$DDW9    001424            320#
$DEVCT   001326            272#
$DEVM    001374            308#   2189
$DOAGN   004100            955     964     969     975#
$ENDAD   004070            191     737     971#   1607
$ENDCT   004054            966#
$ENV     001336            277#    718     754     756    1089    1157    1181    1601    1767
$ENVM    001337            278#    759    1091    1096    1159
$EOP     003662            934#   6331
$EOPCT   004046            963#    967
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DZKCC    MACY11 27(1006)  12-MAY-77  18:34  PAGE 138                                                   PAGE:  0163
DZKCC.P11     21-MAR-77 17:19          CROSS REFERENCE TABLE -- USER SYMBOLS

$ERFLG  001203             218#   705*    937*    999    1028    1030*   1051    1558*   1572    1586*   1660*
$ERMAX  001215             224#  1051
$ERROR  006512             181   1547#
$ERRPC  001216             225#   714*    958*   1007*   1555    1557*   1661*
$ERRTB  001512             379#  1568
$ERTTL  001212             222#   949     989    1615*   1857*
$ETABL  001336             276#
$ETEND  001442             329#   470
$FATAL  001320             269#  1185*
$FFLG   005142            1148*  1151*   1179    1188*   1196#
$FILLC  001256             243#  1114    1145
$FILLS  001255             242#  1145
$GDADR  001220             226#
$GDDAT  001224             228#
$GET42  004060             968#
$GTSWR= ****** U          1525
$HD   = 000000              11
$HIBTS  002034             465#
$HIOCT  005722            1348*  1359#
$ICNT   001204             219#  1036*   1037    1039*   1050
$ILLUP  007316            1637   1653    1677#
$INPUT  005724            1364#  1537
$INTAG  001235             233#
$ITEMB  001214             223#  1563*   1603
$LF     001314             261#  1145    1290    1300    1360
$LFLG   005141            1189*  1195#
$LPADR  001206             220#   716*    916*    920    1043*   1045    1050    1620*   1622    1896*   1906*   1908
$LPERR  001210             221#
$MADR1  001350             294#
$MADR2  001354             298#
$MADR3  001360             301#
$MADR4  001364             304#
$MAIL   001316             267#   466     470    1042    1089
$MAMS1  001346             288#  2185
$MAMS2  001352             296#
$MAMS3  001356             299#
$MAMS4  001362             302#
$MBADR  002036             466#
$MFLG   005140            1149*  1155    1190*   1194#
$MNEW   005552            1304#  1782
$MSGAD  001332             274#  1165*   1168
$MSGLG  001334             275#  1170*
$MSGTY  001316             268#  1163    1171*   1183    1187*
$MSWR   005541            1302#  1779
$MTYP1  001347             289#
$MTYP2  001353             297#
$MTYP3  001357             300#
$MTYP4  001363             303#
$MXCNT  004362            1040   1050#
$N    = 000133               1#  2223    2228    2230    2238#   2254    2258    2260    2267#   2273    2279    2281    2289
                          2290#  2316    2322    2324    2331    2332#   2348    2354    2356    2363    2364#   2380    2386
                          2388   2395    2396#   2412    2418    2420    2427    2428#   2444    2450    2452    2459    2460#
                          2476   2482    2484    2491    2492#   2508    2514    2516    2523    2524#   2540    2546    2548
                          2555   2556#   2572    2578    2580    2587    2588#   2604    2610    2612    2619    2620#   2636
                          2642   2644    2651    2652#   2668    2674    2676    2683    2684#   2700    2706    2708    2715
                          2716#  2732    2738    2740    2747    2748#   2764    2770    2772    2779    2780#   2796    2802
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DZKCC   MACY11 27(1006)  12-MAY-77  18:34  PAGE 139                                                      PAGE:  0164
DZKCC.P11     21-MAR-77 17:19         CROSS REFERENCE TABLE -- USER SYMBOLS

                         2804     2811     2812#    2828     2834     2836     2843     2844#    2872     2878     2880     2887     2888#
                         2916     2922     2924     2932     2933#    2959     2965     2967     2975     2976#    3001     3007     3009
                         3017     3018#    3043     3051     3053     3060     3061#    3072     3078     3080     3088     3089#    3129
                         3135     3137     3145     3146#    3186     3192     3194     3202     3203#    3239     3245     3247     3255
                         3256#    3292     3298     3300     3308     3309#    3349     3355     3357     3365     3366#    3408     3414
                         3416     3424     3425#    3461     3467     3469     3477     3478#    3514     3520     3522     3530     3531#
                         3567     3573     3575     3583     3584#    3620     3626     3628     3636     3637#    3673     3679     3681
                         3689     3690#    3726     3732     3734     3742     3743#    3779     3785     3787     3795     3796#    3832
                         3838     3840     3848     3849#    3895     3901     3903     3911     3912#    3947     3953     3955     3963
                         3964#    4014     4020     4022     4030     4031#    4075     4080     4082     4089     4091#    4106     4111
                         4113     4120     4121#    4136     4142     4144     4151     4152#    4176     4182     4184     4191     4192#
                         4222     4227     4229     4236     4238#    4257     4262     4264     4271     4272#    4295     4300     4302
                         4309     4310#    4329     4335     4337     4344     4345#    4370     4376     4378     4385     4386#    4408
                         4414     4416     4423     4424#    4445     4451     4453     4460     4461#    4482     4488     4490     4498
                         4499#    4544     4549     4551     4559     4560#    4584     4592     4594     4602     4603#    4635     4643
                         4645     4653     4654#    4686     4694     4696     4704     4705#    4737     4745     4747     4755     4756#
                         4788     4796     4798     4806     4807#    4839     4847     4849     4857     4858#    4890     4898     4900
                         4908     4909#    4941     4949     4950     4951     4959     4960#    4992     5000     5001     5002     5010
                         5011#    5043     5051     5052     5053     5061     5062#    5094     5102     5103     5104     5112     5113#
                         5145     5153     5154     5155     5163     5164#    5196     5204     5205     5206     5214     5215#    5247
                         5255     5256     5257     5265     5266#    5298     5306     5307     5308     5316     5317#    5349     5357
                         5358     5359     5367     5368#    5400     5408     5409     5410     5418     5419#    5451     5459     5460
                         5461     5469     5470#    5502     5510     5511     5512     5520     5521#    5553     5561     5562     5563
                         5571     5572#    5604     5612     5613     5614     5622     5623#    5655     5663     5664     5665     5673
                         5674#    5706     5714     5715     5716     5724     5725#    5757     5765     5766     5767     5775     5776#
                         5808     5816     5817     5818     5826     5827#    5859     5867     5868     5869     5877     5878#    5910
                         5918     5919     5920     5928     5929#    5961     5969     5970     5971     5979     5980#    6012     6020
                         6021     6022     6030     6031#    6063     6071     6072     6073     6081     6082#    6114     6122     6123
                         6124     6132     6133#    6165     6173     6174     6175     6183     6184#    6216     6223     6224     6225
                         6232     6233#    6267     6274     6275     6276     6283     6284#    6315     6324     6325     6326     6333
                         6334#    6572#
$NULL     001254          241#    1116     1145
$NWTST= 000000           2232#    2262#    2283#    2326#    2358#    2390#    2422#    2454#    2486#    2518#    2550#    2582#    2614#
                         2646#    2678#    2710#    2742#    2774#    2806#    2838#    2882#    2926#    2969#    3011#    3055#    3082#
                         3139#    3196#    3249#    3302#    3359#    3418#    3471#    3524#    3577#    3630#    3683#    3736#    3789#
                         3842#    3905#    3957#    4024#    4084#    4115#    4146#    4186#    4231#    4266#    4304#    4339#    4380#
                         4418#    4455#    4492#    4553#    4596#    4647#    4698#    4749#    4800#    4851#    4902#    4953#    5004#
                         5055#    5106#    5157#    5208#    5259#    5310#    5361#    5412#    5463#    5514#    5565#    5616#    5667#
                         5718#    5769#    5820#    5871#    5922#    5973#    6024#    6075#    6126#    6177#    6227#    6278#    6328#
$OVER     004334         1012     1015     1026     1038     1044#
$PASS     001324          271#     936*     948      960*     961*     978      986     1034     1051     1856*
$PASTM    002042          468#
$PWRDN    007126          179      702     1637#    1672     6302     6305
$PWRMG    007312         1675#
$PWRUP    007200         1647     1653#
$QUES     001312          259#    1145     1283     1300     1357     1360     1380     1903     1975     1989     2003
$RDCHR    005144         1220#    1526
$RDDEC= ****** U         1529
$RDLIN    005264         1248#    1527
$RDOCT    005564         1321#    1528
$RDSZ =   000007         1241#
$REGAD    001260          245#
$REG0     001262          247#    1416*    1421
$REG1     001264          248#     336*     848     1415*    1422     6572
$REG2     001266          249#    1414*    1423     6572
$REG3     001270          250#    1413*    1424
```

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$REG4    001272        251#     1412*    1425     6572
$REG5    001274        252#     1411*    1426     6572
$RTNAD   004102        977#
$R2A   = ****** U     1529
$S     = 000135          1#     2235     2238#    2265     2267#    2286     2290#    2329     2332#    2361     2364#    2393     2396#
                      2425     2428#    2457     2460#    2489     2492#    2521     2524#    2553     2556#    2585     2588#    2617
                      2620#    2649     2652#    2681     2684#    2713     2716#    2745     2748#    2777     2780#    2809     2812#
                      2841     2844#    2885     2888#    2929     2933#    2972     2976#    3014     3018#    3058     3061#    3085
                      3089#    3142     3146#    3199     3203#    3252     3256#    3305     3309#    3362     3366#    3421     3425#
                      3474     3478#    3527     3531#    3580     3584#    3633     3637#    3686     3690#    3739     3743#    3792
                      3796#    3845     3849#    3908     3912#    3960     3964#    4027     4031#    4087     4091#    4118     4121#
                      4149     4152#    4189     4192#    4234     4238#    4269     4272#    4307     4310#    4342     4345#    4383
                      4386#    4421     4424#    4458     4461#    4496     4499#    4556     4560#    4599     4603#    4650     4654#
                      4701     4705#    4752     4756#    4803     4807#    4854     4858#    4905     4909#    4956     4960#    5007
                      5011#    5058     5062#    5109     5113#    5160     5164#    5211     5215#    5262     5266#    5313     5317#
                      5364     5368#    5415     5419#    5466     5470#    5517     5521#    5568     5572#    5619     5623#    5670
                      5674#    5721     5725#    5772     5776#    5823     5827#    5874     5878#    5925     5929#    5976     5980#
                      6027     6031#    6078     6082#    6129     6133#    6180     6184#    6230     6233#    6281     6284#    6331
                      6334#
$SAVRE= ****** U      1529
$SAVR6   007322       1646*    1654     1655*    1656*    1679#
$SCOPE   004134        177     1006#    2155
$SETUP= 000000         959     1007     1209     1306
$SVLAD   004316       1023     1041#
$SVPC  = 000040        189#     194
$SWR   = 164000          1#      11      258      259      931      959      970      976      978     1000     1001     1002     1003
                      1014     1026     1028     1029     1030     1031     1032     1044     1050     1676     2234     2264     2285
                      2328     2360     2392     2424     2456     2488     2520     2552     2584     2616     2648     2680     2712
                      2744     2776     2808     2840     2884     2928     2971     3013     3057     3084     3141     3198     3251
                      3304     3361     3420     3473     3526     3579     3632     3685     3738     3791     3844     3907     3959
                      4026     4086     4117     4148     4188     4233     4268     4306     4341     4382     4420     4457     4494
                      4555     4598     4649     4700     4751     4802     4853     4904     4955     5006     5057     5108     5159
                      5210     5261     5312     5363     5414     5465     5516     5567     5618     5669     5720     5771     5822
                      5873     5924     5975     6026     6077     6128     6179     6229     6280     6330
$SWREG   001340        279#     720
$SWRMK= 000000        1003
$TESTN   001322        270#    1042*
$TIMES   001310        258#     959*    1031*    1037     1040*    1050     4495*
$TKB     001246        238#    1013     1207     1224     1230     1769     1771     1813     2168
$TKS     001244        237#    1011     1207     1222     1228     1811     2166
$TMP0    001276        253#     775*    1742     2123*    2124*    6234*    6262*    6263
$TMP1    001300        254#     776*    1744
$TMP2    001302        255#     778*     799*     826      835*    1746     1936     1939     2026*
$TMP3    001304        256#     779*    1748     1948     1951     1956     1959     2013     2016     2021     2024
$TMP4    001306        257#     780*    1750     1931*    1943*    2109
$TN    = 000134          1#      11     2232     2234#    2262     2264#    2283     2285#    2326     2328#    2358     2360#    2390
                      2392#    2422     2424#    2454     2456#    2486     2488#    2518     2520#    2550     2552#    2582     2584#
                      2614     2616#    2646     2648#    2678     2680#    2710     2712#    2742     2744#    2774     2776#    2806
                      2808#    2838     2840#    2882     2884#    2926     2928#    2969     2971#    3011     3013#    3055     3057#
                      3082     3084#    3139     3141#    3196     3198#    3249     3251#    3302     3304#    3359     3361#    3418
                      3420#    3471     3473#    3524     3526#    3577     3579#    3630     3632#    3683     3685#    3736     3738#
                      3789     3791#    3842     3844#    3905     3907#    3957     3959#    4024     4026#    4084     4086#    4115
                      4117#    4146     4148#    4186     4188#    4231     4233#    4266     4268#    4304     4306#    4339     4341#
                      4380     4382#    4418     4420#    4455     4457#    4492     4494#    4553     4555#    4596     4598#    4647
                      4649#    4698     4700#    4749     4751#    4800     4802#    4851     4853#    4902     4904#    4953     4955#
                      5004     5006#    5055     5057#    5106     5108#    5157     5159#    5208     5210#    5259     5261#    5310
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DZKCC    MACY11 27(1006)  12-MAY-77  18:34  PAGE 141                                                  PAGE:  0166
DZKCC.P11     21-MAR-77 17:19          CROSS REFERENCE TABLE -- USER SYMBOLS

                         5312#   5361    5363#   5412    5414#   5463    5465#   5514    5516#   5565    5567#   5616    5618#
                         5667    5669#   5718    5720#   5769    5771#   5820    5822#   5871    5873#   5922    5924#   5973
                         5975#   6024    6026#   6075    6077#   6126    6128#   6177    6179#   6227    6229#   6278    6280#
                         6328    6330#
$TPB     001252           240#   1134*   1145    1552*   1816*   2171*
$TPFLG   001257           244#   1083    1145
$TPS     001250           239#   1132    1145    1550    1814    2169
$TRAP    006414           183    1500#
$TRAP2   006436          1511#   1522
$TRP   = 000021          1515#   1524#   1526    1527#   1528#   1529#   1530#   1531#   1532#   1533#   1534#   1535#   1536#
                         1537#   1538#   1539#   1540#   1541#
$TRPAD   006450          1505    1522#
$TSTM    002040           467#
$TSTNM   001202           217#    715*    999    1041*   1042    1044    1051    1629    1683    1885    1892    1894    2234*
                         2264*   2285*   2328*   2360*   2392*   2424*   2456*   2488*   2520*   2552*   2584*   2616*   2648*
                         2680*   2712*   2744*   2776*   2808*   2840*   2884*   2928*   2971*   3013*   3057*   3084*   3141*
                         3198*   3251*   3304*   3361*   3420*   3473*   3526*   3579*   3632*   3685*   3738*   3791*   3844*
                         3907*   3959*   4026*   4086*   4117*   4148*   4188*   4233*   4268*   4306*   4341*   4382*   4420*
                         4457*   4494*   4555*   4598*   4649*   4700*   4751*   4802*   4853*   4904*   4955*   5006*   5057*
                         5108*   5159*   5210*   5261*   5312*   5363*   5414*   5465*   5516*   5567*   5618*   5669*   5720*
                         5771*   5822*   5873*   5924*   5975*   6026*   6077*   6128*   6179*   6229*   6280*   6330*
$TTYIN   005520          1250    1251    1263    1281    1295    1299#
$TYPBN=  ****** U        1524
$TYPDS=  ****** U        1524
$TYPE    004414          1083#   1176    1515    1523
$TYPEC   004626          1113    1120    1127    1132#   1133
$TYPEX   004674          1138    1140    1143#
$TYPOC=  ****** U        1524
$UNIT    001330           273#
$UNITM   002044           469#
$USWR    001342           280#
$VECT1   001366           305#   2187    2188
$VECT2   001370           306#
$XTSTR   004174          1009    1017#
$Y     = 000000             1#    471#
$$GET4=  000000           970#
$4OCAT=  ****** U        1014
.      = 037234           171#    173     176#    189     190#    192#    194#    196#    200#    204#    214#    262     348#
                          349#    350#    351#    360#    448#    454     455#    457#    459#    502#    504#    505#    506#
                          507#    509#    510#    511#    512#    514#    515#    516#    517#    519#    520#    521#    522#
                          524#    525#    526#    527#    529#    530#    531#    532#    534#    535#    536#    537#    539#
                          540#    541#    542#    544#    545#    546#    547#    549#    550#    551#    552#    554#    555#
                          556#    557#    559#    560#    561#    562#    564#    565#    566#    567#    569#    570#    571#
                          572#    574#    575#    576#    577#    579#    580#    581#    582#    743     753     860#    873
                          978    1050    1051    1145    1197#   1207    1299#   1300    1306#   1360    1649    1678    1721#
                         1756#   1758#   1812    1815    1836    1923    1970    2053    2057    2103    2134    2167    2170
                         4506    6311    6417    6435    6450    6465    6473#   6476#
.ADVAN   006060          1400#   1540
.BEGIN   003464           888#
.CNVRT   006170          1433#   1539
.CONVR   006164          1432#   1538
.DATAC   007446          1535    1712#
.DELAY   007332          1533    1685#
.MSTCL   007362          1532    1696#
.RESOS   006132          1421#   1531
.ROMCL   007400          1534    1701#
```

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DZKCC   MACY11 27(1006)  12-MAY-77  18:34  PAGE 142                                                    PAGE: 0167
DZKCC.P11    21-MAR-77 17:19           CROSS REFERENCE TABLE -- USER SYMBOLS

.SAVO5  006072          1407#    1530
.SCOP1  004364          1055#    1529
.START  002402           201      700#     716     1799
.TIMER  007512          1536     1723#
.$ASTA= ****** U        1149     1152
.$X   = 002034           454#     459
```

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DZKCC    MACY11 27(1006)  12-MAY-77  18:34  PAGE 144                                                         PAGE:  0168
DZKCC.P11     21-MAR-77 17:19            CROSS REFERENCE TABLE -- MACRO NAMES

COMMEN    144#
ENDCOM    144#
ERROR      38#    2252    2271    2297    2310    2338    2345    2370    2377    2402    2409    2434    2441    2466    2473
         2498     2505    2530    2537    2562    2569    2594    2601    2626    2633    2658    2665    2690    2697    2722
         2729     2754    2761    2786    2793    2818    2825    2852    2866    2896    2910    2940    2953    2982    2990
         2999     3024    3032    3041    3070    3103    3123    3160    3180    3215    3233    3268    3286    3323    3343
         3381     3402    3437    3455    3490    3508    3543    3561    3596    3614    3649    3667    3702    3720    3755
         3773     3808    3826    3869    3887    3923    3941    3981    4004    4049    4069    4101    4103    4131    4133
         4174     4211    4219    4253    4291    4325    4368    4406    4443    4480    4522    4577    4624    4675    4726
         4777     4828    4879    4930    4981    5032    5083    5134    5185    5236    5287    5338    5389    5440    5491
         5542     5593    5644    5695    5746    5797    5848    5899    5950    6001    6052    6103    6154    6205    6243
         6255     6265    6293    6304    6312    6418    6436    6451    6466
ESCAPE    144#
GETPRI    144#
GETSWR    144#
HLT       157#
KMEND       1#     921
KMFRNT      1#
MULT      144#
NEWTST    144#    2232    2262    2283    2326    2358    2390    2422    2454    2486    2518    2550    2582    2614    2646
         2678     2710    2742    2774    2806    2838    2882    2926    2969    3011    3055    3082    3139    3196    3249
         3302     3359    3418    3471    3524    3577    3630    3683    3736    3789    3842    3905    3957    4024    4084
         4115     4146    4186    4231    4266    4304    4339    4380    4418    4455    4492    4553    4596    4647    4698
         4749     4800    4851    4902    4953    5004    5055    5106    5157    5208    5259    5310    5361    5412    5463
         5514     5565    5616    5667    5718    5769    5820    5871    5922    5973    6024    6075    6126    6177    6227
         6278     6328
POP       144#    1191    1192    1349    1665    1666    2214
PUSH      144#    1152    1154    1175    1323    1639    1645    2177
REPORT      1#     144#
SCOPE      39#    2233    2263    2284    2327    2359    2391    2423    2455    2487    2519    2551    2583    2615    2647
         2679     2711    2743    2775    2807    2839    2883    2927    2970    3012    3056    3083    3140    3197    3250
         3303     3360    3419    3472    3525    3578    3631    3684    3737    3790    3843    3906    3958    4025    4085
         4116     4147    4187    4232    4267    4305    4340    4381    4419    4456    4493    4554    4597    4648    4699
         4750     4801    4852    4903    4954    5005    5056    5107    5158    5209    5260    5311    5362    5413    5464
         5515     5566    5617    5668    5719    5770    5821    5872    5923    5974    6025    6076    6127    6178    6228
         6279     6329
SETPRI    144#
SETTRA   1515#    1526    1527    1528    1529    1530    1531    1532    1533    1534    1535    1536    1537    1538    1539
         1540
SETUP     144#
SKIP      144#
SLASH     144#
SPACE     144#
STARS     144#     187     210     262     265     451     453     460     929     996    1068    1147    1206    1212    1241
         1309     1494    1635    1651    2232    2262    2283    2326    2358    2390    2422    2454    2486    2518    2550
         2582     2614    2646    2678    2710    2742    2774    2806    2838    2882    2926    2969    3011    3055    3082
         3139     3196    3249    3302    3359    3418    3471    3524    3577    3630    3683    3736    3789    3842    3905
         3957     4024    4084    4115    4146    4186    4231    4266    4304    4339    4380    4418    4455    4492    4553
         4596     4647    4698    4749    4800    4851    4902    4953    5004    5055    5106    5157    5208    5259    5310
         5361     5412    5463    5514    5565    5616    5667    5718    5769    5820    5871    5922    5973    6024    6075
         6126     6177    6227    6278    6328
SWRSU     144#
TRMTRP   1515#
TYPBIN    144#
TYPDEC    144#
TYPNAM    144#
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N13

```
TYPNUM   144#
TYPOCS   144#
TYPOCT   144#
TYPTXT   144#
$ADD1      1#   2223
$ADD2      1#   2254
$ADD3      1#   2273    2916
$ADD4      1#   2316    2348    2380    2412    2444    2476    2508    2540    2572    2604    2636    2668    2700    2732
         2764   2796
$ALU       1#   4584    4635    4686    4737    4788    4839    4890    4941    4992    5043    5094    5145    5196    5247
         5298   5349    5400    5451    5502    5553    5604    5655    5706    5757    5808    5859    5910    5961    6012
         6063   6114    6165
$ALUD      1#   4544
$AUTO      1#    785
$BR        1#   3912    3929
$BUFFE     1#   1752
$COMP      1#   6238    6251
$CYCLE     1#   1823
$EOP       1#    921
$ERTBL     1#    381
$FINI      1#   6572
$FLOAT     1#   3090    3109    3147    3166    3204    3221    3257    3274    3310    3329    3367    3387    3426    3443
         3479   3496    3532    3549    3585    3602    3638    3655    3691    3708    3744    3761    3797    3814
$GETPA     1#
$HEADE     1#     11
$INTR      1#   4075    4106
$IR        1#   2959    3001
$MARHI     1#   6401    6458
$MEMFL     1#
$MEM0      1#
$MEM1      1#
$MEM2      1#
$MEM3      1#
$MOCK      1#
$MSG       1#   1740
$NOISE     1#   6315
$NPRBI     1#   4482
$NPR1      1#   4222    4257    4295
$NPR2      1#   4329    4370
$NPR3      1#   4408    4445
$PASEN     1#    935
$PFAIL     1#   1630
$POWER     1#   6267
$PRIO      1#   4136    4176
$PROC1     1#   3043
$PROC2     1#   3072    3129    3186    3239    3292    3349    3408    3461    3514    3567    3620    3673    3726    3779
$PROC3     1#   3832
$PROC4     1#   3895
$PROC5     1#
$QUEST     1#   1932    1944    1952    2009    2017
$RAMCL     1#   1684
$RCLK      1#   1687    1690    1727    1732    3094    3096    3114    3116    3151    3153    3171    3173    3207    3209
         3225   3227    3260    3262    3278    3280    3314    3316    3334    3336    3371    3373    3392    3394    3429
         3431   3447    3449    3482    3484    3500    3502    3535    3537    3553    3555    3588    3590    3606    3608
         3641   3643    3659    3661    3694    3696    3712    3714    3747    3749    3765    3767    3800    3802    3818
         3820   3855    3863    3881    3915    3917    3933    3935    3969    3973    3975    3992    3996    3998    4037
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DZKCC    MACY11 27(1006)  12-MAY-77  18:34  PAGE 146                                                      PAGE:  0170
DZKCC.P11    21-MAR-77 17:19            CROSS REFERENCE TABLE -- MACRO NAMES

            4041    4043    4061    4063    4097    4127    4165    4207    4246    4280    4284    4286    4318    4353    4361
            4363    4399    4401    4430    4433    4436    4467    4470    4473    4515    4565    4567    4569    4571    4612
            4616    4618    4663    4667    4669    4714    4718    4720    4765    4769    4771    4816    4820    4822    4867
            4871    4873    4918    4922    4924    4969    4973    4975    5020    5024    5026    5071    5075    5077    5122
            5126    5128    5173    5177    5179    5224    5228    5230    5275    5279    5281    5326    5330    5332    5377
            5381    5383    5428    5432    5434    5479    5483    5485    5530    5534    5536    5581    5585    5587    5632
            5636    5638    5683    5687    5689    5734    5738    5740    5785    5789    5791    5836    5840    5842    5887
            5891    5893    5938    5942    5944    5989    5993    5995    6040    6044    6046    6091    6095    6097    6142
            6146    6148    6193    6197    6199    6236    6257    6338    6351    6354    6357    6370    6373    6376    6382
            6385    6388    6391    6399    6401    6413    6431    6443    6446    6456    6458    6461    6501    6517    6520
            6537    6548    6550    6558    6560
$ROVAR        1#     331
$SCADD        1#    1007
$SCAD1        1#    1046
$SIMBC        1#
$SOFTC        1#    1760
$SPF          1#    3965    3987
$SP1          1#    3947
$SP2          1#    4014
$TIMER        1#    6216
$TSTN         1#    2230    2260    2281    2324    2356    2388    2420    2452    2484    2516    2548    2580    2612    2644
            2676    2708    2740    2772    2804    2836    2880    2924    2967    3009    3053    3080    3137    3194    3247
            3300    3357    3416    3469    3522    3575    3628    3681    3734    3787    3840    3903    3955    4022    4082
            4113    4144    4184    4229    4264    4302    4337    4378    4416    4453    4490    4551    4594    4645    4696
            4747    4798    4849    4900    4951    5002    5053    5104    5155    5206    5257    5308    5359    5410    5461
            5512    5563    5614    5665    5716    5767    5818    5869    5920    5971    6022    6073    6124    6175    6225
            6276    6326
$UPADD        1#    1658
$VARIA        1#     203
$WRFLT        1#    2845    2858    2889    2902
$WR46         1#    2828    2872
$XZ           1#    2223    2228    2254    2258    2273    2279    2316    2322    2348    2354    2380    2386    2412    2418
            2444    2450    2476    2482    2508    2514    2540    2546    2572    2578    2604    2610    2636    2642    2668
            2674    2700    2706    2732    2738    2764    2770    2796    2802    2828    2834    2872    2878    2916    2922
            2959    2965    3001    3007    3043    3051    3072    3078    3129    3135    3186    3192    3239    3245    3292
            3298    3349    3355    3408    3414    3461    3467    3514    3520    3567    3573    3620    3626    3673    3679
            3726    3732    3779    3785    3832    3838    3895    3901    3947    3953    4014    4020    4075    4080    4106
            4111    4136    4142    4176    4182    4222    4227    4257    4262    4295    4300    4329    4335    4370    4376
            4408    4414    4445    4451    4482    4488    4544    4549    4584    4592    4635    4643    4686    4694    4737
            4745    4788    4796    4839    4847    4890    4898    4941    4949    4992    5000    5043    5051    5094    5102
            5145    5153    5196    5204    5247    5255    5298    5306    5349    5357    5400    5408    5451    5459    5502
            5510    5553    5561    5604    5612    5655    5663    5706    5714    5757    5765    5808    5816    5859    5867
            5910    5918    5961    5969    6012    6020    6063    6071    6114    6122    6165    6173    6216    6223    6267
            6274    6315    6324
$$CMRE      208#     247     248     249     250     251     252
$$CMTM      208#     253     254     255     256     257
$$ESCA      144#
$$NEWT      144#    2232    2262    2283    2326    2358    2390    2422    2454    2486    2518    2550    2582    2614    2646
            2678    2710    2742    2774    2806    2838    2882    2926    2969    3011    3055    3082    3139    3196    3249
            3302    3359    3418    3471    3524    3577    3630    3683    3736    3789    3842    3905    3957    4024    4084
            4115    4146    4186    4231    4266    4304    4339    4380    4418    4455    4492    4553    4596    4647    4698
            4749    4800    4851    4902    4953    5004    5055    5106    5157    5208    5259    5310    5361    5412    5463
            5514    5565    5616    5667    5718    5769    5820    5871    5922    5973    6024    6075    6126    6177    6227
            6278    6328
$$SCOP        1#     990
$$SET      1515#    1526    1527    1528    1529    1530    1531    1532    1533    1534    1535    1536    1537    1538    1539
```

```
         1540
$$SKIP    144#
.EQUAT      1#      34
.HEADE      1#
.SETUP      1#
.$ACT1      1#     185
.$APTB      1#     263#
.$APTH      1#     449
.$APTY      1#    1145
.$CATC      1#
.$CMTA      1#     208
.$EOP       1#     927
.$ERRO      1#
.$ERRT      1#
.$POWE      1#    1633
.$RDOC      1#    1307
.$READ      1#    1204
.$SCOP      1#     994
.$TRAP      1#    1492
.$TYPE      1#    1066
.$TYPO      1#

. ABS.  037234     000

 ERRORS DETECTED:  0
 DEFAULT GLOBALS GENERATED:  0

 DZKCC,DZKCC/SOL/CRF←DZKCC.MAC,DZKCC.P11
 RUN-TIME: 34 32 2 SECONDS
 RUN-TIME RATIO: 116/69=1.6
 CORE USED:  49K  (98 PAGES)
```