KMC11-A DDCMP-MD L UNIT TSTS AH-A911B-MC
CZKCEB0 FICHE 1 OF 1

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                        .REM    $
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IDENTIFICATION

PRODUCT CODE:	AC-A910B-MC
PRODUCT NAME:	CZKCEB0 DDCMP MD L UNIT TSTS
DATE:	AUGUST 1980
MAINTAINER:	DIAGNOSTICS-MERRIMACK

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.

DZKCE TESTS THE KMC-11 LINE UNIT (M8201 OR M8202). IT PERFORMS WRITE/READ TESTS ON THE KMC LINE UNIT REGISTERS. IT CHECKS FOR PROPER TRANSMITTER, RECEIVER, AND BCC OPERATION IN DDCMP MODE. THE MODEM SIGNALS ARE ALSO CHECKED. DZKCE REQUIRES A KMC MICRO-PROCESSOR (M8204) TO RUN. FOR BEST DIAGNOSIS A TURN-AROUND CONNECTOR SHOULD BE INSTALLED, HOWEVER THE DIAGNOSTIC WILL RUN WITHOUT IT (SOME TESTS ARE SKIPPED).

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 MAIN MEMORY TESTS
3. DZKCE [REV] DDCMP LINE UNIT TESTS
4. DZKCF [REV] BITSTUFF LINE UNIT TESTS
5. DZKCA [REV] KMC11 CPU MICRO-DIAGNOSTICS

NOTE: AS UPDATES OCCUR, THE NAMES OF THESE DIAGNOSTICS MAY VARIE.

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)
KMC11-DA OR KMC11-MD OR KMC11-MA

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
(ONLY IF M8201 AND LOOP BACK)
WHICH MODEM TYPE, TYPE 'D'' FOR KMC11-DA (RS232C), OR
TYPE ''F'' FOR KMC11-FA (V.35)? D
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.

```
187
188
189                          4.1     CONTROL SWITCH SETTINGS
190
191                                  SW 15 SET:  HALT ON ERROR
192                                  SW 14 SET:  LOOP ON CURRENT TEST
193                                  SW 13 SET:  INHIBIT ERROR PRINT OUT
194                                  SW 12 SET:  INHIBIT TYPE OUT ABELL ON ERROR.
195                                  SW 11 SET:  INHIBIT ITERATIONS.  (QUICK PASS)
196                                  SW 10 SET:  ESCAPE TO NEXT TEST ON ERROR
197                                  SW 09 SET:  LOOP WITH CURRENT DATA
198                                  SW 08 SET:  CATCH ERROR AND LOOP ON IT
199                                  SW 07 SET:  USE PREVIOUS STATUS TABLE.
200                                  SW 06 SET:  HALT IN   ROMCLK   ROUTINE   BEFORE   CLOCKING
201                                              MICRO-PROCESSOR
202                                  SW 05 SET:  RESERVED
203                                  SW 04 SET:  RESERVED
204                                  SW 03 SET:  RESELECT KMC11'S DESIRED ACTIVE
205                                  SW 02 SET:  LOCK ON SELECTED TEST
206                                  SW 01 SET:  RESTART PROGRAM AT SELECTED TEST
207                                  SW 00 SET:  BUILD NEW STATUS TABLE FROM QUESTIONS.  (IF SW07=0
208                                                AND  SW00=0  A  NEW  STATUS  TABLE  IS  BUILT BY
209                                                AUTO-SIZING)
210
211                                  SWITCH 06 AND 08-15 ARE DYNAMIC AND CAN BE CHANGED  AS  NEEDED
212                                  WHILE THE DIAGNOSTIC IS RUNNING.  SWITCHES 00-03 AND SWITCH 07
213                                  ARE STATIC, AND ARE USED ONLY ON STARTING  OR  RESTARTING  THE
214                                  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 INTERMITTEMT ERRORS; SW14=1 WILL LOOP ON TEST REGUARDLESS OF ERROR OR NOT ERROR. (SW14=1, SW10=0, SW09=0, SW08=1,0)
3. SW11 INHIBIT INTERATIONS.
4. SW14 LOOP ON CURRENT TEST.

4.2 STARTING ADDRESS

STARTING ADDRESS IS AT 000200 THERE ARE NO OTHER STARTING ADDRESSES FOR THE KMC11 DIAGNOSTICS. (SEE SECTION 4.0)

NOTE: IF ADDRESS 000042 IS NON-ZERO THE PROGRAM ASSUMES IT IS UNDER ACT11 OR XXDP CONTROL AND WILL ACT ACCORDINGLY AFTER ALL AVAILABLE KMC11'S ARE TESTED THE PROGRAM WILL RETURN TO 'XXDP' OR 'ACT-11'.

5. OPERATING PROCEDURE

WHEN PROGRAM IS INITIALLY STARTED MESSAGES AS DESCRIBED IN SECTION 4.0 WILL BE PRINTED, AND PROGRAM WILL BEGIN RUNNING THE DIAGNOSTIC

5.2 PROGRAM AND/OR OPERATOR ACTION

THE TYPICAL APPROACH SHOULD BE

1. HALT ON ERROR (VIA SW 15=1) WHEN EVER AN ERROR OCCURS.
2. CLEAR SW 15.
3. SET SW 14: (LOOP ON THIS TEST)
4. SET SW 13: (INHIBIT ERROR PRINT OUT)

THE TEST NUMBER AND PC WILL BE TYPED OUT AND POSSIBILY AN ERROR MESSAGE (THIS DEPENDS ON THE TEST) TO GIVE THE OPERATOR AN IDEA AS TO THE SOURCE OF THE PROBLEM. IF IT IS NECESSARY TO KNOW MORE INFORMATION CONCERNING THE ERROR REPORT; LOOK IN THE LISTING FOR THAT TEST NUMBER WHICH WAS TYPED OUT AND THEN NOTE THE PC OF THE ERROR REPORT THIS WAY THE EXACT FUNCTION OF THE TEST CAN BE DETERMINED.

6. ERRORS

AS DESCRIBED PREVIOUSLY THERE WILL ALWAYS BE A TEST NUMBER AND PC TYPED OUT AT THE TIME OF AN ERROR (PROVIDING SW 13=0 AND SW 12=0). IN MOST CASES ADDITIONAL INFORMATION WILL BE SUPPLIED IN THE THE ERROR MESSAGE TO GIVE THE OPERATOR AN INDICATION OF THE ERROR.

6.2 ERROR RECOVERY

IF FOR SOME REASON THE KMC11 SHOULD 'HANG THE BUS' (GAIN CONTROL OF BUS SO THAT CONSOLE MANUAL FUNCTIONS ARE INHIBITED) AN INIT OR POWER DOWN/UP IS NECESSARY FOR OPERATOR TO REGAIN CONTROL OF CPU. IF THIS SHOULD HAPPEN; LOOK IN LOCATION '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 COMPLETLY ISOLATE PROBLEMS.

7.2 OPERATING RESTRICTIONS

THE FIRST TIME A KMC11 DIAGNOSTIC IS LOADED INTO CORE AND RUN THE STATUS TABLE MUST BE SET UP. THIS IS DONE BY MANUAL INPUT (SW00=1) OR BY AUTOSIZING (SW00=0 AND SW07=0). THEREAFTER HOWEVER THE STATUS TABLE NEED NOT BE SETUP BY SUBSEQUENT RESTARTS OR EVEN LOADING THE NEXT 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,

LINE UNIT(M8201)- JUMPERS W1, W2, AND W4 MUST BE IN. JUMPERS W3, AND W5 MUST BE OUT. SW8 OF E26 MUST BE IN THE ON POSITION.

LINE UNIT (M8202)- JUMPER W1 MUST BE IN. SW8 OF E26 MUST BE IN THE OFF POSITION.

8. MISCELLANEOUS

8.1 EXECUTION TIME

ALL KMC11 DEVICE DIAGNOSTICS WILL GIVE AN 'END PASS' MESSAGE (PROVIDING NO ERRORS AND SW12=0) WITHIN 4 MINS. THIS IS ASSUMING SW11=1 (DELETE ITERATIONS) IS SET TO GIVE THE FASTEST POSSIBLE EXECUTION. THE ACTUAL EXECUTION TIME DEPENDS GREATLY ON THE PDP11 CPU CONFIGURATION AND THE AMOUNT OF MEMORY IN THE SYSTEM.

8.2 PASS COMPLETE

NOTE: EVERY TIME THE PROGRAM IS STARTED; THE TESTS WILL RUN AS IF SW11 (DELETE ITERATIONS) WAS UP (=1). THIS IS TO 'VERIFY NO HARD ERRORS' AS SOON AS POSSIBLE. THEREFORE THE FIRST PASS -EACH TIME PROGRAM IS STARTED- WILL BE A 'QUICK PASS' UNTIL ALL 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 DZKCE 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 (1470) 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

```
463
464
465                     EACH MAP ENTRY CONTAINS  4  WORDS  WHICH  CONTAIN  THE  STATUS
466                     INFORMATION  FOR  1  KMC11.  THE PC SHOWS WHERE IN CORE MEMORY
467                     THE FIRST OF THE 4 WORDS IS.  IN THE EXAMPLE ABOVE  THE  FIRST
468                     KMC'S STATUS IS IN LOCATIONS, 2100, 2102, 2104, AND 2106.  THE
469                     SECOND KMC STATUS IS LOCATED AT 2110, 2112,  2114,  AND  2116.
470                     THE  INFORMATION  CONTAINED IN EACH 4 WORD ENTRY IS DEFINED AS
471                     FOLLOWS:
472
473                     CSR:    CONTAINS KMC11 CSR ADDRESS
474
475                     STAT1:  BITS 00-08 IS KMC11 VECTOR ADDRESS
476                             BIT14=1 TURNAROUND CONNECTOR IS ON
477                             BIT14=0 NO TURNAROUND CONNECTOR
478                             BIT13=0 LINE UNIT IS AN M8201
479                             BIT13=1 LINE UNIT IS AN M8202
480                             BIT12=1 NO LINE UNIT
481                             BITS 09-11 IS KMC11 BR PRIORITY LEVEL
482
483                     STAT2:  LOW BYTE IS SWITCH PAC#1 (DDCMP LINE NUMBER)
484                             HIGH BYTE IS SWITCH PAC#2 (BM873 BOOT ADD)
485
486                     STAT3:  BIT 2=0  KMC11-DA
487                             BIT 2=1 KMC11-FA
488
```

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 CRAM ADDRESS IS WRITTEN TO A 125252 THEN IT IS READ BACK. IF IT CONTAINS A -1 OR 125252 , 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?
```

```
545
546
547                     WHERE XXXXXX IS THE CURRENT CONTENTS OF  THE  SOFTWARE  SWITCH
548                     REGISTER  IN  OCTAL.   THE  SOFTWARE CONTROL ROUTINE WILL THEN
549                     AWAIT OPERATOR ACTION.  AT WHICH TIME THE OPERATOR IS REQUIRED
550                     TO  TYPE  ONE  OR  MORE OF THE LEGAL CHARACTERS:  1) 0 - 7, 2)
551                     LINE FEED(<LF>), 3) CARRIAGE  RETURN(<CR>),  OR  4)  CONTROL-U
552                     (CTRL  U).   NO  CHECK  IS  MADE  FOR  LEGALITY.  IF THE INPUT
553                     CHARACTER IS NOT A <LF>, <CR>, OR CTRL U IT IS ASSUMED  TO  BE
554                     AN OCTAL DIGIT.
555
556                     TO CHANGE THE CONTENTS OF THE SSR THE  OPERATOR  SIMPLY  TYPES
557                     THE  NEW  DESIRED  VALUE  IN OCTAL - LEADING ZEROS NEED NOT BE
558                     TYPED.  AND TERMINATES THE INPUT STRING WITH A  <CR>  OR  <LF>
559                     DEPENDING  ON  THE  PROGRAM ACTION DESIRED AS DESCRIBED BELOW.
560                     THE INPUT VALUE WILL BE TRUNCATED TO THE LAST 6 DIGITS  TYPED.
561                     AT  LEAST  ONE  DIGIT  MUST BE TYPED ON ANY GIVEN INPUT STRING
562                     PRIOR TO THE TERMINATOR BEFORE A CHANGE TO THE SSR WILL OCCUR.
563
564                     WHEN THE INPUT STRING IS TERMINATED WITH A <CR> THE DIAGNOSTIC
565                     WILL  CONTINUE  EXECUTION  FROM  THE  POINT  AT  WHICH  IT WAS
566                     INTERRUPTED.  IF A <CR> IS THE ONLY THING  TYPED  THE  PROGRAM
567                     WILL CONTINUE WITHOUT CHANGING THE SSR.  THE <LF> DIFFERS FROM
568                     THE <CR> BY RESTARTING THE PROGRAM AS IF IT WERE RESTARTED  AT
569                     ADDRESS 200.
570
571                     IF A CTRL U IS TYPED AT ANY POINT IN THE INPUT STRING PRIOR TO
572                     THE  TERMINATOR  THE  INPUT  VALUE WILL BE DISREGARDED AND THE
573                     PROMPT DISPLAYED (SWR = XXXXXX NEW?).
574
575                     TO SET THE SSR FOR  THE  STARTING  SWITCHES,  FIRST  LOAD  THE
576                     DIAGNOSTIC, THEN HIT CTRL G, THEN START THE DIAGNOSTIC.
577
578
579                     ************************************************************
580
581                     NOTE:  FOR IPG'S LINE UNIT M8202-YE USERS.
582
583
584                     CABLE DATA TEST:[TEST 56 TEST 57]
585
586                             THESE TESTS WON'T RUN RELIABLY ON LINE  UNITS  WITHOUT
587                     TERMINATING RESISTENCE.
```

```
588
589
590                                     APT/ACT/XXDP/SLIDE
591
592                                     THIS DIAGNOSTIC IS APT/ACT/XXDP/SLIDE COMPATIBLE USER WOULD BE
593                                     ABLE TO RUN IT UNDER APT/ACT/XXDP ENVIRONMENT.
594
595                                     NOTE:  FOR MANUFACTURING PURPOSE ONLY ITS DESCRIBED HOW TO RUN
596                                     UNDER APT ENVIRONMENT.
597
598                                     ************************************************************
599
600                                     ETABLE SETTING FOR APT TO RUN UNDER APT
601
602
603                                     --------------------
604                                             FIRST PASS TIME:
605
606                                             LONGEST TEST TIME:
607
608                                             ADDITIONAL TEST TIME:
609
610                                     ALL  THE  ABOVE  PARAMETERS  ARE   DEPENDENT   ON   PARTICULAR
611                                     DIAGNOSTICS  AND  SHOULD  BE  LOADED  AT  THE  TIME OF SETTING
612                                     ETABLE.THERE IS NO DEFAULT TIME SET UP.
613
614                                     SOFTWARE ENVIRONMENT:001        ENVIRONMENT MODE:200
615
616                                     SWITCH 1:-SHOULD BE USED AS NORMAL SWITCH REGISTER.
617
618                                     SWITCH 2:-NOT USED.
619
620                                     CPU OPTIONS:-NOT USED.
621
622                                     MEMORY TYPE 1:-BITS<2:4>:=BITS <12:14> OF STAT1 OF DEV:0.
623
624                                     MAXIMUM ADDRESS:-BITS<17:19>:=BITS<12:14> OF STAT1 OF DEV:1
625
626                                                     BITS<2:4>:=BITS <12:14> OF STAT1 OF DEV:2
627
628                                                     BITS<10:12>:=BITS<12:14> OF STAT1 OF DEV:3
629
630                                     IN THE SAME MANNER
631
632                                     MEMORY TYPE 2 MAXIMUM  ADDRESS:-GETS  STAT1<12:14>  OF  DEVICE
633                                     4,5,6,7.
634
635                                     MEMORY TYPE 3 MAXIMUM  ADDRESS:-GETS  STAT1<12:14>  OF  DEVICE
636                                     8,9,10,11.
637
638                                     MEMORY TYPE 4 MAXIMUM  ADDRESS:-GETS  STAT1<12:14>  OF  DEVICE
639                                     12,13,14,15.
640
641                                     INTERRUPT VECTOR 1:FIRST DEVICE RECEIVE VECTOR.
```

```
642
643
644                                 REST OF THE DEVICE(KMC'S) VECTOR SHOULD BE SET UP SEQUENTIALLY
645                                 IN INCREMENTS OF 10.
646
647                                 BUS PRIORITY:KMC'S PRIORITY(SHOULD BE SAME FOR ALL KMC'S UNDER
648                                 TEST).
649
650                                 INTERRUPT VECTOR 2:NOT USED.
651
652                                 BUS PRIORITY:NOT USED.
653
654                                 BASE ADDRESS:FIRST DEVICE CSR ADDRESS.
655
656                                         REST SHOULD FOLLOW SEQUENTIALLY
657
658                                         IN INCREMENTS OF 10.
659
660                                 DEVICE MAP:AS DESCRIBED IN APT MANUAL.
661
662                                 CONTROLLER SPECIFIC CODE 1:-NO.  OF DEVICES UNDER TEST.
663
664                                 CONTROLLER SPECIFIC CODE 2:-NOT USED.
665
666                                 DEVICE DESCRIPTOR WORD 0:STAT2 OF FIRST DEVICE.
667
668                                 .  .
669
670                                 .  .
671
672                                 TO
673
674                                 .  .
675
676                                 .  .
677
678                                 DEVICE DESCRIPTOR WORD 15:STAT2 OF 16TH DEVICE.(KMC)
679
680                         9.0   HISTORY
681
682                                 THIS DIAGNOSTIC WAS UPDATED TO DETECT FOR THE CONDITION OF V.35
683                                 AND M8201.  IN THIS CONIFURATION, RING WILL NOT BE LOOPED BACK
684                                 AND SHOULD NOT BE TESTED FOR.
685                         $
```

```
                                .TITLE  CZKCE
                                ;*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.
                                ;*
                                ;*CZKCE   KMC11 DDCMP LINE UNIT TESTS
                                ;*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 "CZKCE   KMC11 DDCMP LINE UNIT TESTS"
                                ;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
```

```
                        R3=     %3              ;;GENEPAL REGISTER
                        R4=     %4              ;;GENERAL REGISTER
                        R5=     %5              ;;GENERAL REGISTER
                        R6=     %6              ;;GENERAL REGISTER
                        R7=     %7              ;;GENERAL REGISTER
                        SP=     %6              ;;STACK POINTER
                        PC=     %7              ;;PROGRAM COUNTER

                        ;*PRIORITY LEVEL DEFINITIONS
                        PR0=    0               ;;PRIORITY LEVEL 0
                        PR1=    40              ;;PRIORITY LEVEL 1
                        PR2=    100             ;;PRIORITY LEVEL 2
                        PR3=    140             ;;PRIORITY LEVEL 3
                        PR4=    200             ;;PRIORITY LEVEL 4
                        PR5=    240             ;;PRIORITY LEVEL 5
                        PR6=    300             ;;PRIORITY LEVEL 6
                        PR7=    340             ;;PRIORITY LEVEL 7

                        ;*''SWITCH REGISTER'' SWITCH DEFINITIONS
                        SW15=   100000
                        SW14=   40000
                        SW13=   20000
                        SW12=   10000
                        SW11=   4000
                        SW10=   2000
                        SW09=   1000
                        SW08=   400
                        SW07=   200
                        SW06=   100
                        SW05=   40
                        SW04=   20
                        SW03=   10
                        SW02=   4
                        SW01=   2
                        SW00=   1
                        .EQUIV  SW09,SW9
                        .EQUIV  SW08,SW8
                        .EQUIV  SW07,SW7
                        .EQUIV  SW06,SW6
                        .EQUIV  SW05,SW5
                        .EQUIV  SW04,SW4
                        .EQUIV  SW03,SW3
                        .EQUIV  SW02,SW2
                        .EQUIV  SW01,SW1
                        .EQUIV  SW00,SW0

                        ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
                        BIT15=  100000
                        BIT14=  40000
                        BIT13=  20000
                        BIT12=  10000
                        BIT11=  4000
                        BIT10=  2000
                        BIT09=  1000
                        BIT08=  400
                        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  055103  041513  MTITLE: .ASCII  <200><12>/CZKCE/<200>
(2) 001010  046513  030503  020061          .ASCIZ  /KMC11 DDCMP LINE UNIT TESTS/<200>
(2)
177570                          DSWR    =       177570
177570                          DDISP   =       177570
```

```
                                .SBTTL  COMMON TAGS

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

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

```
                                ;;*****************************************************************
                                .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
```

```
1005  001424  000000                $DDW9:  .WORD   ADDW9   ;;DEVICE DESCRIPTOR WORD#9
1006  001426  000000                $DDW10: .WORD   ADDW10  ;;DEVICE DESCRIPTOR WORD#10
1007  001430  000000                $DDW11: .WORD   ADDW11  ;;DEVICE DESCRIPTOR WORD#11
1008  001432  000000                $DDW12: .WORD   ADDW12  ;;DEVICE DESCRIPTOR WORD#12
1009  001434  000000                $DDW13: .WORD   ADDW13  ;;DEVICE DESCRIPTOR WORD#13
1010  001436  000000                $DDW14: .WORD   ADDW14  ;;DEVICE DESCRIPTOR WORD#14
1011  001440  000000                $DDW15: .WORD   ADDW15  ;;DEVICE DESCRIPTOR WORD#15
1012
1013
1014  001442                        $ETEND:
1015
1016                                ;
1017                                ;  PROGRAM CONTROL PARAMETERS
1018                                ;-------------------------------
1019  001442  000000                NEXT:   .WORD   0               ; ADDRSS OF NEXT TEST TO BE EXECUTED
1020  001444  000000                LOCK:   .WORD   0               ; ADDRESS FOR LOCK CURRENT DATA
1021                                ;
1022                                ;   PROGRAM VARIABLES
1023                                ;----------------------
1024  001446  000000                STRTSW: .WORD   0               ; SWITCHES AT START OF PROGRAM
1025  001450  000000                STAT:   .WORD   0               ; KM STATUS WORD STORAGE
1026  001452  000000                CLKX:   .WORD   0               ;
1027  001454  000000                MASKX:  .WORD   0               ;
1028  001456  000000                SAVSP:  .WORD   0               ; STACK POINTER STORAGE
1029  001460  000000                SAVPC:  .WORD   0               ; PROGRAM COUNTER STORAGE
1030  001462  000000                ZERO:   .WORD   0               ;
1031  001464  000001                ONE:    .WORD   1               ;
1032  001466  000000                MEMLIM: .WORD   0               ; HIGHEST LOCATION FOR NPR'S
1033  001470  000001                KMACTV: .BLKW   1               ; KMC11 SELECTED ACTIVE
1034  001472  000001                KMNUM:  .BLKW   1               ; OCTAL NUMBER OF KMC11'S
1035  001474  000001                SAVACT: .BLKW   1               ; ORIGINAL ACTIVE DEVICES.
1036  001476  000001                SAVNUM: .BLKW   1               ; WORKABLE NUMBER.
1037  001500  000000                RUN:    .WORD   0               ; POINTER TO RUNNING DEVICES
1038                                        .EVEN
1039  001502  002072                CREAM:  .WORD   KM.MAP-6        ; TABLE POINTER
1040  001504  002276                MILK:   .WORD   CNT.MAP-4       ; TABLE POINTER
1041                                ;
1042                                ;  PROGRAM CONTROL FLAGS
1043                                ;-----------------------
1044  001506     000                INIFLG: .BYTE   0               ; PROGRAM INITIALIZING FLAG
1045        001510                          .EVEN
1046  001510     000                LOKFLG: .BYTE   0               ; LOCK ON CURRENT TEST FLAG
1047  001511     000                QV.FLG: .BYTE   0               ; QUICK VERIFY FLAG
1048                                                               ; ON FIRST PASS OF EACH KMC11 ITERATIONS WILL BE SUPPRES
1049                                        .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  032062                          EM1
001522  033225                          DH2             ; ERROR 1
001524  033542                          DT2
001526  032120                          EM2
001530  033225                          DH2             ; ERROR 2
001532  033542                          DT2
001534  032163                          EM3
001536  033225                          DH2             ; ERROR 3
001540  033542                          DT2
001542  032227                          EM4
001544  000000                          0               ; ERROR 4
001546  000000                          0
001550  032271                          EM5
001552  033225                          DH2             ; ERROR 5
001554  033542                          DT2
001556  032271                          EM5
001560  033263                          DH3             ; ERROR 6
001562  033560                          DT3
001564  032321                          EM6
001566  033204                          DH1             ; ERROR 7
001570  033530                          DT1
001572  032340                          EM7
001574  033204                          DH1             ; ERROR 10
001576  033530                          DT1
001600  032365                          EM10
001602  033204                          DH1             ; ERROR 11
001604  033530                          DT1
001606  032550                          EM11
001610  033361                          DH5             ; ERROR 12
001612  033604                          DT5
001614  032577                          EM12
001616  033361                          DH5             ; ERROR 13
001620  033604                          DT5
001622  032550                          EM11
001624  033321                          DH4             ; ERROR 14
001626  033572                          DT4
```

```
1106  001630  032623                    EM13
1107  001632  000000                    0                ; ERROR 15
1108  001634  000000                    0
1109  001636  032550                    EM11
1110  001640  033361                    DH5              ; ERROR 16
1111  001642  033622                    DT6
1112  001644  032577                    EM12
1113  001646  033361                    DH5              ; ERROR 17
1114  001650  033622                    DT6
1115  001652  032550                    EM11
1116  001654  033413                    DH6              ; ERROR 20
1117  001656  033640                    DT7
1118  001660  032550                    EM11
1119  001662  033413                    DH6              ; ERROR 21
1120  001664  033662                    DT10
1121  001666  032577                    EM12
1122  001670  033413                    DH6              ; ERROR 22
1123  001672  033640                    DT7
1124  001674  032577                    EM12
1125  001676  033413                    DH6              ; ERROR 23
1126  001700  033662                    DT10
1127  001702  032663                    EM14
1128  001704  000000                    0                ; ERROR 24
1129  001706  000000                    0
1130  001710  032733                    EM15
1131  001712  033204                    DH1              ; ERROR 25
1132  001714  033530                    DT1
1133  001716  032754                    EM16
1134  001720  033263                    DH3              ; ERROR 16
1135  001722  033704                    DT11
1136  001724  032577                    EM12
1137  001726  033204                    DH1              ; ERROR 27
1138  001730  033716                    DT12
1139  001732  032770                    EM17
1140  001734  000000                    0                ; ERROR 30
1141  001736  000000                    0
1142  001740  033034                    EM20
1143  001742  033204                    DH1              ; ERROR 31
1144  001744  033530                    DT1
1145  001746  033055                    EM21
1146  001750  033461                    DH7              ; ERROR 32
1147  001752  000000                    0
1148  001754  033055                    EM21
1149  001756  033263                    DH3              ; ERROR 33
1150  001760  033560                    DT3
1151  001762  033072                    EM22
1152  001764  033504                    DH10             ; ERROR 34
1153  001766  000000                    0
1154  001770  033115                    EM23
1155  001772  033225                    DH2              ; ERROR 35
1156  001774  033542                    DT2
1157  001776  033137                    EM24
1158  002000  000000                    0                ; ERROR 36
1159  002002  000000                    0
1160  002004  033162                    EM25
1161  002006  000000                    0                ; ERROR 37
```

```
1162  002010  000000                    0
1163  002012  032321                    EM6
1164  002014  033225                    DH2             ; ERROR 40
1165  002016  033542                    DT2
1166  002020  032271                    EM5
1167  002022  033361                    DH5             ; ERROR 41
1168  002024  033604                    DT5
1169  002026  032623                    EM13
1170  002030  033204                    DH1             ; ERROR 42
1171  002032  033530                    DT1
1172          002034            .=2034
1173                            .SBTTL  APT PARAMETER BLOCK
1174
1175                            ;;*****************************************************************
1176                            ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
1177                            ;;*****************************************************************
1178          002034                    .$X=.   ;;SAVE CURRENT LOCATION
1179          000024                    .=24    ;;SET POWER FAIL TO POINT TO START OF PROGRAM
1180  000024  000200                    200     ;;FOR APT START UP
1181          000044                    .=44    ;;POINT TO APT INDIRECT ADDRESS PNTR.
1182  000044  002034                    $APTHDR ;;POINT TO APT HEADER BLOCK
1183          002034                    .=.$X   ;;RESET LOCATION COUNTER
1184                            ;;*****************************************************************
1185                            ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
1186                            ;INTERFACE SPEC.
1187
1188  002034                    $APTHD:
1189  002034  000000            $HIBTS: .WORD   0       ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
1190  002036  001316            $MBADR: .WORD   $MAIL   ;;ADDRESS OF APT MAILBOX (BITS 0-15)
1191  002040  000132            $TSTM:  .WORD   90.     ;;RUN TIM OF LONGEST TEST
1192  002042  000137            $PASTM: .WORD   95.     ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
1193  002044  000137            $UNITM: .WORD   95.     ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
1194  002046  000052                    .WORD   $ETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)
1195
```

```
1196
1197                                    ;KMC11 CONTROL INDICATORS FOR CURRENT KMC11 UNDER TEST
1198                                    ;----------------------------------------------------
1199
1200  002050  000000                    STAT1:  0
1201  002052  000000                    STAT2:  0
1202  002054  000000                    STAT3:  0
1203
1204                                    ;KMC11 VECTOR AND REGISTER INDIRECT POINTERS
1205                                    ;-------------------------------------------
1206
1207  002056  000000                    KMRVEC: 0               ;POINTER TO KMC11 RECEIVER INTERRUPT VECTOR
1208  002060  000000                    KMRLVL: 0               ;POINTER TO KMC11 RECEIVER INTERRUPT SERVICE PS
1209  002062  000000                    KMTVEC: 0               ;POINTER TO KMC11 TRANSMITTER INTERRUPT VECTOR
1210  002064  000000                    KMTLVL: 0               ;POINTER TO KMC11 TRANSMITTER INTERRUPT SERVICE PS
1211  002066  000000                    KMCSR:  0               ;POINTER TO KMC11 CONTROL STATUS REGISTER
1212  002070  000000                    KMCSRH: 0               ;POINTER TO KMC11 CONTROL STATUS REGISTER HIGH BYTE.
1213  002072  000000                    KMCTL:  0               ;POINTER TO KMC11 CONTOL OUT REGISTER
1214  002074  000000                    KMP04:  0               ;POINTER TO KMC11 PORT REGISTER(SEL 4)
1215  002076  000000                    KMP06:  0               ;POINTER TO KMC11 PORT REGISTER(SEL 6)
1216
1217                                    ;TEMP STORAGE
1218                                    ;------------
1219
1220                                    ;TEMP:  0
1221                                    ;.=.+40
1222
1223                                    ;KMC11 STATUS TABLE AND ADDRESS ASSIGNMENTS
1224                                    ;------------------------------------------
1225
1226          002100                    .=2100
1227  002100                            KM.MAP:
1228  002100  000001                    KMCR00: .BLKW   1               ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 00
1229  002102  000001                    KMS100: .BLKW   1               ;VECTOR FOR KMC11 NUMBER 00
1230  002104  000001                    KMS200: .BLKW   1               ;DDCMP LINE# FOR KMC11 NUMBER 00
1231  002106  000001                    KMS300: .BLKW   1               ;3RD STATUS WORD
1232
1233  002110  000001                    KMCR01: .BLKW   1               ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 01
1234  002112  000001                    KMS101: .BLKW   1               ;VECTOR FOR KMC11 NUMBER 01
1235  002114  000001                    KMS201: .BLKW   1               ;DDCMP LINE# FOR KMC11 NUMBER 01
1236  002116  000001                    KMS301: .BLKW   1               ;3RD STATUS WORD
1237
1238  002120  000001                    KMCR02: .BLKW   1               ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 02
1239  002122  000001                    KMS102: .BLKW   1               ;VECTOR FOR KMC11 NUMBER 02
1240  002124  000001                    KMS202: .BLKW   1               ;DDCMP LINE# FOR KMC11 NUMBER 02
1241  002126  000001                    KMS302: .BLKW   1               ;3RD STATUS WORD
1242
1243  002130  000001                    KMCR03: .BLKW   1               ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 03
1244  002132  000001                    KMS103: .BLKW   1               ;VECTOR FOR KMC11 NUMBER 03
1245  002134  000001                    KMS203: .BLKW   1               ;DDCMP LINE# FOR KMC11 NUMBER 03
1246  002136  000001                    KMS303: .BLKW   1               ;3RD STATUS WORD
1247
1248  002140  000001                    KMCR04: .BLKW   1               ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 04
1249  002142  000001                    KMS104: .BLKW   1               ;VECTOR FOR KMC11 NUMBER 04
1250  002144  000001                    KMS204: .BLKW   1               ;DDCMP LINE# FOR KMC11 NUMBER 04
1251  002146  000001                    KMS304: .BLKW   1               ;3RD STATUS WORD
```

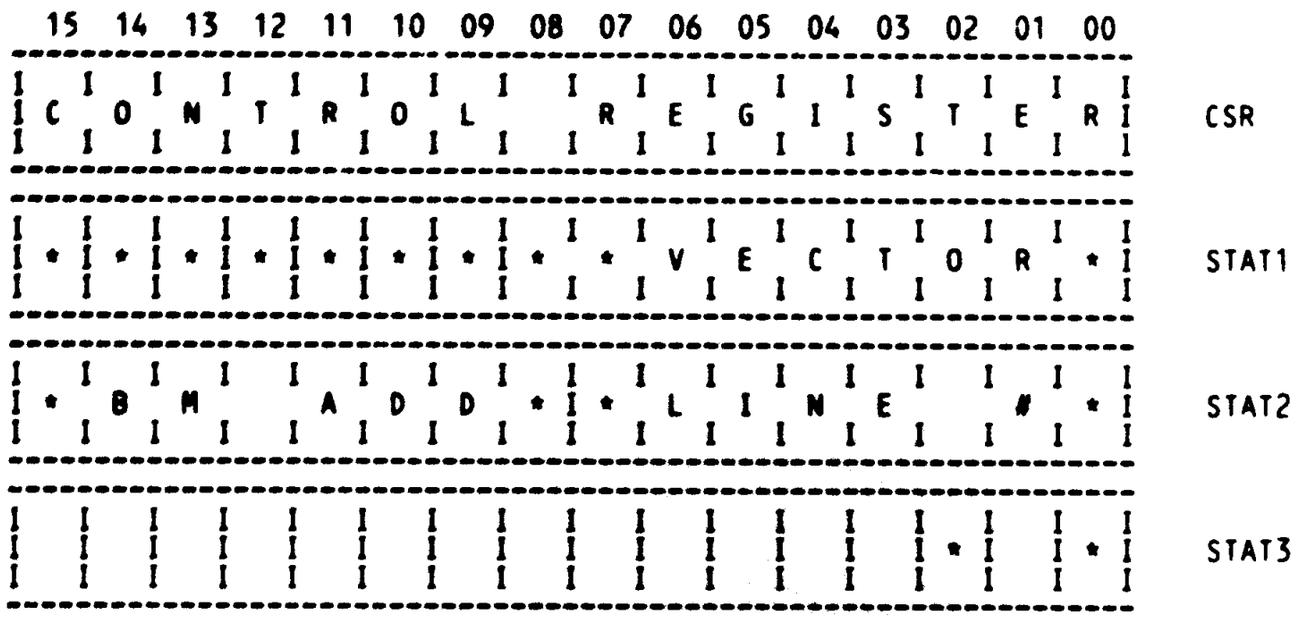
```
1252
1253  002150  000001          KMCR05: .BLKW   1       ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 05
1254  002152  000001          KMS105: .BLKW   1       ;VECTOR FOR KMC11 NUMBER 05
1255  002154  000001          KMS205: .BLKW   1       ;DDCMP LINE# FOR KMC11 NUMBER 05
1256  002156  000001          KMS305: .BLKW   1       ;3RD STATUS WORD
1257
1258  002160  000001          KMCR06: .BLKW   1       ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 06
1259  002162  000001          KMS106: .BLKW   1       ;VECTOR FOR KMC11 NUMBER 06
1260  002164  000001          KMS206: .BLKW   1       ;DDCMP LINE# FOR KMC11 NUMBER 06
1261  002166  000001          KMS306: .BLKW   1       ;3RD STATUS WORD
1262
1263  002170  000001          KMCR07: .BLKW   1       ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 07
1264  002172  000001          KMS107: .BLKW   1       ;VECTOR FOR KMC11 NUMBER 07
1265  002174  000001          KMS207: .BLKW   1       ;DDCMP LINE# FOR KMC11 NUMBER 07
1266  002176  000001          KMS307: .BLKW   1       ;3RD STATUS WORD
1267
1268  002200  000001          KMCR10: .BLKW   1       ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 10
1269  002202  000001          KMS110: .BLKW   1       ;VECTOR FOR KMC11 NUMBER 10
1270  002204  000001          KMS210: .BLKW   1       ;DDCMP LINE# FOR KMC11 NUMBER 10
1271  002206  000001          KMS310: .BLKW   1       ;3RD STATUS WORD
1272
1273  002210  000001          KMCR11: .BLKW   1       ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 11
1274  002212  000001          KMS111: .BLKW   1       ;VECTOR FOR KMC11 NUMBER 11
1275  002214  000001          KMS211: .BLKW   1       ;DDCMP LINE# FOR KMC11 NUMBER 11
1276  002216  000001          KMS311: .BLKW   1       ;3RD STATUS WORD
1277
1278  002220  000001          KMCR12: .BLKW   1       ;CONTROL STATUS REGISTER FOR KMC 1 NUMBER 12
1279  002222  000001          KMS112: .BLKW   1       ;VECTOR FOR KMC11 NUMBER 12
1280  002224  000001          KMS212: .BLKW   1       ;DDCMP LINE# FOR KMC11 NUMBER 12
1281  002226  000001          KMS312: .BLKW   1       ;3RD STATUS WORD
1282
1283  002230  000001          KMCR13: .BLKW   1       ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 13
1284  002232  000001          KMS113: .BLKW   1       ;VECTOR FOR KMC11 NUMBER 13
1285  002234  000001          KMS213: .BLKW   1       ;DDCMP LINE# FOR KMC11 NUMBER 13
1286  002236  000001          KMS313: .BLKW   1       ;3RD STATUS WORD
1287
1288  002240  000001          KMCR14: .BLKW   1       ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 14
1289  002242  000001          KMS114: .BLKW   1       ;VECTOR FOR KMC11 NUMBER 14
1290  002244  000001          KMS214: .BLKW   1       ;DDCMP LINE# FOR KMC11 NUMBER 14
1291  002246  000001          KMS314: .BLKW   1       ;3RD STATUS WORD
1292
1293  002250  000001          KMCR15: .BLKW   1       ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 15
1294  002252  000001          KMS115: .BLKW   1       ;VECTOR FOR KMC11 NUMBER 15
1295  002254  000001          KMS215: .BLKW   1       ;DDCMP LINE# FOR KMC11 NUMBER 15
1296  002256  000001          KMS315: .BLKW   1       ;3RD STATUS WORD
1297
1298  002260  000001          KMCR16: .BLKW   1       ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 16
1299  002262  000001          KMS116: .BLKW   1       ;VECTOR FOR KMC11 NUMBER 16
1300  002264  000001          KMS216: .BLKW   1       ;DDCMP LINE# FOR KMC11 NUMBER 16
1301  002266  000001          KMS316: .BLKW   1       ;3RD STATUS WORD
1302
1303  002270  000001          KMCR17: .BLKW   1       ;CONTROL STATUS REGISTER FOR KMC11 NUMBER 17
1304  002272  000001          KMS117: .BLKW   1       ;VECTOR FOR KMC11 NUMBER 17
1305  002274  000001          KMS217: .BLKW   1       ;DDCMP LINE# FOR KMC11 NUMBER 17
1306  002276  000001          KMS317: .BLKW   1       ;3RD STATUS WORD
1307
```

```
  1308  002300  000000                KM.END: 000000
```

```
1309
1310                                    ;KMC11 PASS COUNT AND ERROR COUNT TABLE
1311                                    ;--------------------------------------
1312
1313  002302                            CNT.MAP:
1314  002302  000000                    PACT00: 0               ;PASS COUNT FOR KMC11 NUMBER 00
1315  002304  000000                    ERCT00: 0               ;ERROR COUNT FOR KMC11 NUMBER 00
1316
1317  002306  000000                    PACT01: 0               ;PASS COUNT FOR KMC11 NUMBER 01
1318  002310  000000                    ERCT01: 0               ;ERROR COUNT FOR KMC11 NUMBER 01
1319
1320  002312  000000                    PACT02: 0               ;PASS COUNT FOR KMC11 NUMBER 02
1321  002314  000000                    ERCT02: 0               ;ERROR COUNT FOR KMC11 NUMBER 02
1322
1323  002316  000000                    PACT03: 0               ;PASS COUNT FOR KMC11 NUMBER 03
1324  002320  000000                    ERCT03: 0               ;ERROR COUNT FOR KMC11 NUMBER 03
1325
1326  002322  000000                    PACT04: 0               ;PASS COUNT FOR KMC11 NUMBER 04
1327  002324  000000                    ERCT04: 0               ;ERROR COUNT FOR KMC11 NUMBER 04
1328
1329  002326  000000                    PACT05: 0               ;PASS COUNT FOR KMC11 NUMBER 05
1330  002330  000000                    ERCT05: 0               ;ERROR COUNT FOR KMC11 NUMBER 05
1331
1332  002332  000000                    PACT06: 0               ;PASS COUNT FOR KMC11 NUMBER 06
1333  002334  000000                    ERCT06: 0               ;ERROR COUNT FOR KMC11 NUMBER 06
1334
1335  002336  000000                    PACT07: 0               ;PASS COUNT FOR KMC11 NUMBER 07
1336  002340  000000                    ERCT07: 0               ;ERROR COUNT FOR KMC11 NUMBER 07
1337
1338  002342  000000                    PACT10: 0               ;PASS COUNT FOR KMC11 NUMBER 10
1339  002344  000000                    ERCT10: 0               ;ERROR COUNT FOR KMC11 NUMBER 10
1340
1341  002346  000000                    PACT11: 0               ;PASS COUNT FOR KMC11 NUMBER 11
1342  002350  000000                    ERCT11: 0               ;ERROR COUNT FOR KMC11 NUMBER 11
1343
1344  002352  000000                    PACT12: 0               ;PASS COUNT FOR KMC11 NUMBER 12
1345  002354  000000                    ERCT12: 0               ;ERROR COUNT FOR KMC11 NUMBER 12
1346
1347  002356  000000                    PACT13: 0               ;PASS COUNT FOR KMC11 NUMBER 13
1348  002360  000000                    ERCT13: 0               ;ERROR COUNT FOR KMC11 NUMBER 13
1349
1350  002362  000000                    PACT14: 0               ;PASS COUNT FOR KMC11 NUMBER 14
1351  002364  000000                    ERCT14: 0               ;ERROR COUNT FOR KMC11 NUMBER 14
1352
1353  002366  000000                    PACT15: 0               ;PASS COUNT FOR KMC11 NUMBER 15
1354  002370  000000                    ERCT15: 0               ;ERROR COUNT FOR KMC11 NUMBER 15
1355
1356  002372  000000                    PACT16: 0               ;PASS COUNT FOR KMC11 NUMBER 16
1357  002374  000000                    ERCT16: 0               ;ERROR COUNT FOR KMC11 NUMBER 16
1358
1359  002376  000000                    PACT17: 0               ;PASS COUNT FOR KMC11 NUMBER 17
1360  002400  000000                    ERCT17: 0               ;ERROR COUNT FOR KMC11 NUMBER 17
1361
```

1362
1363
1364
1365
1366
1367

FORMAT OF STATUS TABLE



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])

BIT2=0 DMC11-DA (RS232C)
BIT2=1 DMC11-FA (V.35)

```
CZKCE   MACY11 30A(1052)  08-JUL-80  08:24  PAGE 32
CZKCE.P11    08-JUL-80 08:24            APT PARAMETER BLOCK                SEQ 0031

        $
```

```
1419
1420                                        ;PROGRAM INITIALIZATION
1421                                        ;LOCK OUT INTERRUPTS
1422                                        ;SET UP PROCESSOR STACK
1423                                        ;SET UP POWER FAIL VECTOR
1424                                        ;CLEAR PROGRAM CONTROL FLAGS AND COUNTS
1425                                        ;TYPE TITLE MESSAGE
1426
1427  002402  012737  000340  177776  .START: MOV     #340,PS          ;LOCK OUT INTERRUPTS
1428  002410  012706  001200                 MOV     #STACK,SP        ;SET UP STACK
1429  002414  012737  007126  000024         MOV     #$PWRDN,@#24     ;SET UP POWER FAIL VECTOR
1430  002422  013737  001472  001476         MOV     KMNUM,SAVNUM     ;SAVE NUMBER OF DEVICES IN SYSTEM.
1431  002430  005037  011544                 CLR     SWFLG            ;CLEAR SOFT TYPEOUT FLAG
1432  002434  105037  001203                 CLRB    $ERFLG           ;CLEAR ERROR FLAG
1433  002440  105037  001511                 CLRB    QV.FLG           ;ZERO QUICK VERIFY FLAG
1434  002444  012737  002070  001502         MOV     #KM.MAP-10,CREAM;GET MAP POINTER.
1435  002452  012737  002276  001504         MOV     #CNT.MAP-4,MILK  ;GET PASS COUNT MAP POINTER
1436  002460  012737  100000  001500         MOV     #BIT15,RUN       ;POINT POINTER TO FIRST DEVICE.
1437  002466  012700  002302                 MOV     #CNT.MAP,R0      ;PASS COUNT POINTER TO R0
1438  002472  005020                  23$:    CLR     (R0)+            ;CLEAR TABLE
1439  002474  020027  002402                 CMP     #CNT.MAP+100,R0  ;DONE YET?
1440  002500  001374                         BNE     23$              ;KEEP GOING
1441  002502  005037  001216                 CLR     $ERRPC           ;CLEAR LAST ERROR POINTER
1442  002506  012737  000001  001202         MOV     #1,$TSTNM        ;SET UP FOR TEST 1
1443  002514  012737  002402  001206         MOV     #.START,$LPADR   ;SET UP FOR POWER FAIL BEFORE
1444                                        ;TESTING STARTS
1445  002522  132737  000001  001336         BITB    #1,$ENV          ; IS IT RUNNING UNDER APT?
1446  002530  001404                         BEQ     3$               ; IF NOT CHECK FOR TYPE OF SWITCH REGISTER.
1447  002532  013737  001340  000176         MOV     $SWREG,SWREG     ; LOAD SOFTWARE SWITCH REG.
1448  002540  000423                         BR      6$+2             ; GO SET UP SOFTWARE SWITCH REG.
1449  002542  013746  000006          3$:    MOV     @#6,-(SP)        ;SAVE CURRENT VECTORS
1450  002546  013746  000004                 MOV     @#4,-(SP)        ;
1451  002552  012737  002606  000004         MOV     #6$,@#4          ;SET UP FOR TIMEOUT
1452  002560  012737  177570  001240         MOV     #177570,SWR      ;SET SWR TO HARD SWR ADDRESS
1453  002566  012737  177570  001242         MOV     #177570,DISPLAY  ;SET DISPLAY TO HARD SWR ADDRESS
1454  002574  022777  177777  176436         CMP     #-1,@SWR         ;REFERENCE HARDWARE SWITCH REGISTER
1455  002602  001402                         BEQ     6$+2             ;IF = -1 USE SOFT SWR ANYWAY
1456  002604  000407                         BR      7$               ;IF IT EXISTS AND NOT = -1 USE HARD SWR
1457  002606  022626                  6$:    CMP     (SP)+,(SP)+      ;ADJUST STACK
1458  002610  012737  000176  001240         MOV     #SWREG,SWR       ;POINTER TO SOFT SWR
1459  002616  012737  000174  001242         MOV     #DISPREG,DISPLAY;POINTER TO SOFT DISPLAY REG
1460  002624  012637  000004          7$:    MOV     (SP)+,@#4        ;RESTORE VECTORS
1461  002630  012637  000006                 MOV     (SP)+,@#6        ;
1462  002634  105737  001506                 TSTB    INIFLG           ;HAS INITIALIZATION BEEN PERFORMED
1463  002640  001006                         BNE     20$              ;BR IF YES
1464  002642  022737  004070  000042         CMP     #$ENDAD,@#42     ;IF ACT-11 AUTOMATIC MODE, DON'T TYPE ID
1465  002650  001402                         BEQ     20$
1466  002652  104401  001000                 TYPE    ,MTITLE          ;TYPE TITLE MESSAGE
1467  002656  004737  011340          20$:   JSR     PC,CKSWR                 ;CHECK FOR SOFT SWR
1468  002662  017737  176352  001446         MOV     @SWR,STRTSW      ;STORE STARTING SWITCHES
1469  002670  005737  000042                 TST     @#42             ;IS IT RUNNING IN AUTO MODE?
1470  002674  001402                         BEQ     .+6              ;BR IF NO
1471  002676  005037  001446                 CLR     STRTSW           ;IF YES, CLEAR SWITCHES
1472  002702  032737  000001  001446         BIT     #SW00,STRTSW     ;IF SW00=1, QUESTIONS ARE ASKED.
1473  002710  001012                         BNE     17$              ;BR IF SW00=1
1474  002712  105737  001446                 TSTB    STRTSW           ;BIT7=1??
```

```
1475  002716  100007                        BPL     17$             ;BR IF SW07=0
1476  002720  005737  001470                TST     KMACTV          ;ARE ANY DEVICES SELECTED?
1477  002724  001027                        BNE     16$             ;BR IF YES
1478  002726  104401  011057                TYPE,   NOACT           ;NO DEVICES SELECTED.
1479  002732  000000                        HALT                    ;STOP THE SHOW
1480  002734  000776                        BR      .-2             ;DISQUALIFY CONTINUE SWITCH
1481  002736  105737  001336        17$:    TSTB    $ENV            ; IS IT UNDER APT DUMP MODE?
1482  002742  001405                        BEQ     27$             ; YES, CHECK IF APT SIZED IT?
1483  002744  132737  000001  001336        BITB    #1,$ENV         ; IS IT UNDER Q,V OR RUN MODE?
1484  002752  001012                        BNE     30$             ; YES, NEEDS ONLY APT SIZING.
1485  002754  000406                        BR      33$             ; NO, NEEDS REGULAR AUTO.SIZE.
1486  002756  105737  001337        27$:    TSTB    $ENVM           ; IS IT SIZED BY APT?
1487  002762  100406                        BMI     30$             ; YES, NEEDS ONLY APT SIZING.
1488  002764  042737  000001  001446        BIC     #SW00,STRTSW    ; SIZE ONLY IN AUTO MODE.
1489  002772  004737  012236        33$:    JSR     PC,AUTO.SIZE    ; GO DO THE AUTO.SIZE.
1490  002776  000402                        BR      16$             ; GO PRINT THE MAP.
1491  003000  004737  013716        30$:    JSR     PC,APT.SIZE     ; GO DO THE APT SIZING.
1492  003004  105737  001506        16$:    TSTB    INIFLG          ;FIRST TIME?
1493  003010  001410                        BEQ     21$             ;BR IF YES
1494  003012  105737  001446                TSTB    STRTSW          ;IF USING SAME PARAMETERS DONT TYPE MAP
1495  003016  100431                        BMI     1$
1496  003020  032737  000006  001446        BIT     #BIT1!BIT2,STRTSW;IS TEST NO. OR LOCK SELECTED
1497  003026  001403                        BEQ     24$             ;IF NO THEN TYPE STATUS
1498  003030  000424                        BR      1$              ;IF YES DO NOT TYPE STATUS
1499  003032  105137  001506        21$:    COMB    INIFLG          ;SET FLAG
1500  003036  104401  010100        24$:    TYPE    ,XHEAD          ;TYPE HEADER
1501  003042  012704  002100                MOV     #KM.MAP,R4      ;SET POINTER
1502  003046  010437  001276        5$:     MOV     R4,$TMP0        ;SET ADDRESS
1503  003052  012437  001300                MOV     (R4)+,$TMP1     ;SET CSR
1504  003056  001411                        BEQ     1$              ;ALL DONE IF ZERO
1505  003060  012437  001302                MOV     (R4)+,$TMP2     ;SET STAT1
1506  003064  012437  001304                MOV     (R4)+,$TMP3     ;SET STAT2
1507  003070  012437  001306                MOV     (R4)+,$TMP4     ;SET STAT3
1508  003074  104416                        CONVRT                  ;TYPE OUT STATUS MAP
1509  003076  011206                        XSTATQ                  ;
1510  003100  000762                        BR      5$
1511  003102  012700  002100        1$:     MOV     #KM.MAP,R0      ;R0 POINTS TO STATUS TABLE
1512
1513                                ;;**********************************************************************
1514                                ;;*AUTO SIZE TEST
1515                                ;;*THIS TEST VERIFYS THAT THE KMC11S AND/OR KMC11S ARE AT THE CORRECT FLOATING
1516                                ;;*ADDRESSES FOR YOUR SYSTEM. IF THIS TEST FAILS, IT IS NOT A HARDWARE ERROR.
1517                                ;;*CHECK THE ADDRESSES OF ALL FLOATING DEVICES (DJ,DH,DQ,DU,DUP,LK,DMC,DZ,KMC).
1518                                ;;*IF THERE ARE NO OTHER FLOATING DEVICES BEFORE THE KMC11, THE FIRST
1519                                ;;* KMC11 IS 760110. NO DEVICE SHOULD EVER BE AT
1520                                ;;*ADDRESS 760000.
1521                                ;;**********************************************************************
1522
1523  003106  013746  000004                MOV     @#4,-(SP)       ;SAVE LOC 4
1524  003112  013746  000006                MOV     @#6,-(SP)       ;SAVE LOC 6
1525  003116  005037  000006                CLR     @#6             ;CLEAR VEC+2
1526  003122  005037  001302                CLR     $TMP2           ;CLEAR FLAG
1527  003126  011037  002066        AUSTRT: MOV     (R0),KMCSR      ;GET NEXT KMC CSR
1528  003132  001510                        BEQ     AUDONE          ;BR IF DONE
1529  003134  012737  003240  000004  2$:     MOV     #NODEV,@#4      ;SET UP FOR TIMEOUT
1530  003142  012703  000010        3$:     MOV     #10,R3          ;R3 IS COUNT OF DEVICES BEFORE KMC
```

```
 1531  003146  012702  003342          4$:     MOV     #DEVTAB,R2      ;R2 IS DEVICE TABLE PONTER
 1532  003152  012701  160010                  MOV     #160010,R1      ;START WITH ADDRESS 160010
 1533  003156  005711                  FLOAT:  TST     (R1)            ;CHECK ADDRESS IN R1
 1534  003160  111204                          MOVB    (R2),R4         ;IF NO TIMEOUT, GET NEXT ADDRESS
 1535  003162  060401                          ADD     R4,R1           ;IN R1
 1536  003164  005201                          INC     R1              ;
 1537  003166  040401                          BIC     R4,R1           ;
 1538  003170  005703                          TST     R3              ;ANY MORE DEVICES TO CHECK FOR?
 1539  003172  001371                          BNE     FLOAT           ;BR IF YES
 1540  003174  012737  003244  000004          MOV     #ERR,@#4        ;OK ONLY KMC'S ARE LEFT, SET UP FOR TIMEOUT
 1541  003202  005711                  FY:     TST     (R1)            ;CHECK KMC ADDRESS
 1542  003204  020137  002066                  CMP     R1,KMCSR        ;DOES IT MATCH
 1543  003210  001403                          BEQ     OK              ;BR IF YES
 1544  003212  062701  000010                  ADD     #10,R1          ;GET NEXT KMC ADDRESS
 1545  003216  000771                          BR      FY              ;DO IT AGAIN
 1546  003220  062700  000010          OK:     ADD     #10,R0          ;SKIP TO NEXT KMC CSR
 1547  003224  062701  000010                  ADD     #10,R1          ; GET NEXT KMC ADDRESS
 1548  003230  011037  002066                  MOV     (R0),KMCSR      ; GET NEXT KMC CSR
 1549  003234  001447                          BEQ     AUDONE          ; BRANCH IF ALL DONE.
 1550  003236  000761                          BR      FY              ; DO IT AGAIN.
 1551  003240  122243                  NODEV:  CMPB    (R2)+,-(R3)     ;ON TIMEOUT, INC R2, DEC R3
 1552  003242  000002                          RTI                     ;$LPADR
 1553  003244  005737  001302          ERR:    TST     $TMP2           ;CHECK FLAG IF = 0 TYPE HEADER
 1554  003250  001014                          BNE     1$              ;SKIP HEADER
 1555  003252  104401                          TYPE                    ;TYPEOUT HEADER MESSAGE
 1556  003254  011110                          CONERR                  ;CONFIGURATION ERROR!!!!
 1557  003256  012737  003244  001460          MOV     #ERR,SAVPC      ;SAVE PC FOR TYPEOUT
 1558  003264  104417                          CNVRT                   ;TYPE OUT ERROR PC
 1559  003266  003322                          ERRPC                   ;
 1560  003270  104401                          TYPE                    ;TYPE REST OF HEADER
 1561  003272  011155                          CNERR                   ;
 1562  003274  012737  177777  001302          MOV     #-1,$TMP2       ;SET FLAG SO IT ONLY GETS TYPED ONCE
 1563  003302  010137  001264          1$:     MOV     R1,$REG1        ;SAVE R1 FOR TYPEOUT
 1564  003306  104416                          CONVRT
 1565  003310  003330                          CONTAB                  ;TYPE CSR VALUES
 1566  003312  104401                  3$:     TYPE
 1567  003314  011176                          KMCM
 1568  003316  022626                  4$:     CMP     (SP)+,(SP)+     ;ADJUST STACK
 1569  003320  000737                          BR      OK              ;BR TO GET OUT
 1570  003322  000001                  ERRPC:  1
 1571  003324     006     002                  .BYTE   6,2
 1572  003326  001460                          SAVPC
 1573  003330  000002                  CONTAB: 2
 1574  003332     006     004                  .BYTE   6,4
 1575  003334  001264                          $REG1
 1576  003336     006     002                  .BYTE   6,2
 1577  003340  002066                          KMCSR
 1578  003342     007                  DEVTAB: .BYTE   7               ;DJ
 1579  003343     017                          .BYTE   17              ;DH
 1580  003344     007                          .BYTE   7               ;DQ
 1581  003345     007                          .BYTE   7               ;DU
 1582  003346     007                          .BYTE   7               ;DUP
 1583  003347     007                          .BYTE   7               ;LK
 1584  003350     007                          .BYTE   7               ;DMC
 1585  003351     007                          .BYTE   7               ;DZ
 1586  003352     007                          .BYTE   7               ;KMC
```

```
1587            003354                          .EVEN
1588  003354                                    AUDONE:
1589  003354    012637  000006                  1$:     MOV     (SP)+,@#6       ;RESTORE LOC 6
1590  003360    012637  000004                          MOV     (SP)+,@#4       ;RESTORE LOC 4
1591  003364    032737  000010  001446                  BIT     #SW03,STRTSW    ;SELECT SPECIFIC DEVICES??
1592  003372    001422                                  BEQ     3$              ;BR IF NO.
1593  003374    104401  010020                          TYPE    ,MNEW           ;TYPE THE MESSAGE.
1594  003400    005000                                  CLR     R0              ;ZERO DATA LIGHTS
1595  003402    000000                                  HALT                    ;WAIT FOR USER TO TELL WHAT DEVICES TO RUN
1596  003404    027737  175630  001474                  CMP     @SWR,SAVACT     ;IS THE NUMBER VALID?
1597  003412    101404                                  BLOS    2$              ;BR IF NUMBER IS OK.
1598  003414    104401  007673                          TYPE    ,MERR3          ;TELL USER OF INVALID NUMBER.
1599  003420    000000                                  HALT                    ;STOP EVERY THING.
1600  003422    000776                                  BR      .-2             ;RESTART THE PROGRAM AGAIN.
1601  003424    017737  175610  001470  2$:     MOV     @SWR,KMACTV     ;GET NEW DEVICE PATTERN
1602  003432    013700  001470                          MOV     KMACTV,R0       ;SHOW THE USER WHAT HE SELECTED.
1603  003436    000000                                  HALT                    ;CONTINUE DYNAMIC SWITCHES.
1604  003440    012700  000300          3$:     MOV     #300,R0         ;PREPARE TO CLEAR THE FLOATING
1605  003444    012701  000302                          MOV     #302,R1         ;VECTOR AREA. 300-776
1606  003450    010120                          4$:     MOV     R1,(R0)+        ;START PUTTING "PC+2 - HALT"
1607  003452    005021                                  CLR     (R1)+           ;IN VECTOR AREA.
1608  003454    022021                                  CMP     (R0)+,(R1)+     ;POP POINTERS
1609  003456    022700  001000                          CMP     #1000,R0        ;ALL DONE??
1610  003462    001372                                  BNE     4$              ;BR IF NO.
1611
1612                                            ;TEST START AND RESTART
1613                                            ;----------------------
1614
1615  003464    012706  001200                  .BEGIN: MOV     #STACK,SP       ;SET UP STACK
1616  003470    013746  000006                          MOV     @#6,-(SP)       ;SAVE LOC 6
1617  003474    013746  000004                          MOV     @#4,-(SP)       ;SAVE LOC 4
1618  003500    005000                                  CLR     R0              ;START AT 0
1619  003502    012737  003546  000004                  MOV     #2$,@#4         ;SET UP FOR TIME OUT
1620  003510    005037  000006                          CLR     @#6             ;TO AUTOSIZE MEMORY
1621  003514    005720                          6$:     TST     (R0)+           ;CHECK ADDRESS IN R0
1622  003516    022700  157776                          CMP     #157776,R0      ;IS IT AT LEAST 28K
1623  003522    001374                                  BNE     6$              ;BR IF NO
1624  003524    162700  007776                          SUB     #7776,R0        ;SAVE 2K FOR MONITORS
1625  003530    010037  001466          7$:     MOV     R0,MEMLIM       ;STORE MEMORY LIMIT
1626  003534    012637  000004                          MOV     (SP)+,@#4       ;RESTORE LOC 4
1627  003540    012637  000006                          MOV     (SP)+,@#6       ;RESTORE LOC 6
1628  003544    000413                                  BR      10$             ;CONTINUE
1629  003546    022626                          2$:     CMP     (SP)+,(SP)+     ;ADJUST STACK
1630  003550    162700  000004                          SUB     #4,R0           ;GET LAST GOOD ADDRESS
1631  003554    162700  007776                          SUB     #7776,R0        ;SAVE 2K FOR MONITORS
1632  003560    022700  030000                          CMP     #30000,R0       ;IS IT 8K?
1633  003564    001361                                  BNE     7$              ;BR IF NO
1634  003566    012700  037400                          MOV     #37400,R0       ;IF 8K DON'T SAVE 2K
1635  003572    000756                                  BR      7$              ;
1636  003574    012737  000340  177776  10$:     MOV     #340,PS         ;LOCK OUT INTERRUPTS
1637  003602    032737  000004  001446                  BIT     #BIT2,STRTSW    ;CHECK FOR LOCK ON TEST
1638  003610    001406                                  BEQ     1$              ;BR IF NO LOCK DESIRED.
1639  003612    104401  007717                          TYPE    ,MLOCK          ;TYPE LOCK SELECTED.
1640  003616    012737  000240  004146                  MOV     #NOP,TTST       ;SET UP TO LOCK
1641  003624    000403                                  BR      3$              ;CONTINUE ALONG.
1642  003626    013737  004360  004146  1$:     MOV     BRW,TTST        ;PREPARE NORMAL SCOPE ROUTINE
```

```
 1643  003634  012737  011606  001206  3$:     MOV     #CYCLE,$LPADR   ;START AT "CYCLE" FIND WHICH DEVICE TO TEST
 1644  003642  032737  000002  001446  4$:     BIT     #SW01,STRTSW    ;IS TEST NO. SELECTED?
 1645  003650  001002                          BNE     5$              ;BR IF YES
 1646  003652  104401  007643                  TYPE    ,MR             ;TYPE R
 1647  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  007746                  TYPE    ,MCSRX          ; TYPE "CSR"
003704  104417  004104                  CNVRT   ,XCSR           ; SHOW IT.
003710  104401  007754                  TYPE    ,MVECX          ; TYPE VECTOR.
003714  104417  004112                  CNVRT   ,XVEC           ; SHOW IT.
003720  104401  007762                  TYPE    ,MPASSX         ; TYPE " PASSES "
003724  104417  004120                  CNVRT   ,XPASS          ; SHOW IT.
003730  104401  007773                  TYPE    ,MERRX          ; TYPE " ERRORS "
003734  104417  004126                  CNVRT   ,XERR           ; SHOW IT.
003740  013700  001304                  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
```

```
1704  004102  011606                  $RTNAD: .WORD   CYCLE
1705  004104  000001                  XCSR:   1
1706  004106     006      002                .BYTE   6,2
1707  004110  002066                         KMCSR
1708  004112  000001                  XVEC:   1
1709  004114     004      002                .BYTE   4,2
1710  004116  002056                         KMRVEC
1711  004120  000001                  XPASS:  1
1712  004122     006      002                .BYTE   6,2
1713  004124  001324                         $PASS
1714  004126  000001                  XERR:   1
1715  004130     006      002                .BYTE   6,2
1716  004132  001212                         $ERTTL
1717
1718                                         ;SCOPE LOOP AND INTERATION HANDLER
1719                                         ;-------------------------------
1720
1721                                 .SBTTL  SCOPE HANDLER ROUTINE
1722
1723                                 ;;*****************************************************************
1724                                 ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
1725                                 ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
1726                                 ;*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
1727                                 ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
1728                                 ;*SW14=1         LOOP ON TEST
1729                                 ;*SW11=1         INHIBIT ITERATIONS
1730                                 ;*CALL
1731                                 ;*      SCOPE            ;;SCOPE=IOT
1732
1733  004134                         $SCOPE:
1734  004134  005037  001216                CLR     $ERRPC                  ; CLEAR LAST ERROR PC
1735  004140  023716  014142                CMP     TST1+2,(SP)             ; IS THIS TEST #1 ?
1736  004144  001413                        BEQ     $XTSTR                  ; IF SO DON'T LOOP.
1737  004146  000406                TTST:   BR      1$                      ;
1738  004150  105777  175070                TSTB    @$TKS                   ; KEYBOARD DONE ?
1739  004154  100067                        BPL     $OVER                   ; IF NO DONT WAIT.
1740  004156  017766  175064  177776        MOV     @$TKB,-2(SP)            ;
1741  004164  032777  040000  175046  1$:    BIT     #BIT14,@SWR     ;;LOOP ON PRESENT TEST?
1742  004172  001060                        BNE     $OVER           ;;YES IF SW14=1
1743                                 ;#####START OF CODE FOR THE XOR TESTER#####
1744  004174  000416                $XTSTR: BR      6$              ;;IF RUNNING ON THE ''XOR'' TESTER CHANGE
1745                                                                 ;;THIS INSTRUCTION TO A ''NOP'' (NOP=240)
1746  004176  013746  000004                MOV     @#ERRVEC,-(SP)  ;;SAVE THE CONTENTS OF THE ERROR VECTOR
1747  004202  012737  004222  000004        MOV     #5$,@#ERRVEC    ;;SET FOR TIMEOUT
1748  004210  005737  177060                TST     @#177060        ;;TIME OUT ON XOR?
1749  004214  012637  000004                MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
1750  004220  000436                        BR      $SVLAD          ;;GO TO THE NEXT TEST
1751  004222  022626                5$:     CMP     (SP)+,(SP)+     ;;CLEAR THE STACK AFTER A TIME OUT
1752  004224  012637  000004                MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
1753  004230  000441                        BR      $OVER           ;;LOOP ON THE PRESENT TEST
1754  004232                         6$:;#####END OF CODE FOR THE XOR TESTER#####
1755  004232  105737  001203        2$:     TSTB    $ERFLG          ;;HAS AN ERROR OCCURRED?
1756  004236  001404                        BEQ     3$              ;;BR IF NO
1757  004240  105037  001203        4$:     CLRB    $ERFLG          ;;ZERO THE ERROR FLAG
1758  004244  005037  001310                CLR     $TIMES          ;;CLEAR THE NUMBER OF ITERATIONS TO MAKE
1759  004250  032777  004000  174762  3$:    BIT     #BIT11,@SWR     ;;INHIBIT ITERATIONS?
```

```
 1760  004256  001011                          BNE     1$              ;;BR IF YES
 1761  004260  005737  001324                  TST     $PASS           ;;IF FIRST PASS OF PROGRAM
 1762  004264  001406                          BEQ     1$              ;;      INHIBIT ITERATIONS
 1763  004266  005237  001204                  INC     $ICNT           ;;INCREMENT ITERATION COUNT
 1764  004272  023737  001310  001204          CMP     $TIMES,$ICNT    ;;CHECK THE NUMBER OF ITERATIONS MADE
 1765  004300  002015                          BGE     $OVER           ;;BR IF MORE ITERATION REQUIRED
 1766  004302  012737  000001  001204  1$:     MOV     #1,$ICNT        ;;REINITIALIZE THE ITERATION COUNTER
 1767  004310  013737  004362  001310          MOV     $MXCNT,$TIMES   ;;SET NUMBER OF ITERATIONS TO DO
 1768  004316  105237  001202          $SVLAD: INCB    $TSTNM          ;;COUNT TEST NUMBERS
 1769  004322  113737  001202  001322          MOVB    $TSTNM,$TESTN   ;;SET TEST NUMBER IN APT MAILBOX
 1770  004330  011637  001206                  MOV     (SP),$LPADR     ;;SAVE SCOPE LOOP ADDRESS
 1771  004334  013777  001202  174700  $OVER:  MOV     $TSTNM,@DISPLAY ;;DISPLAY TEST NUMBER
 1772  004342  013716  001206                  MOV     $LPADR,(SP)     ;;FUDGE RETURN ADDRESS
 1773  004346  005037  001444                  CLR     LOCK                    ; RESET LOCK ON DATA.
 1774  004352  013701  002066                  MOV     KMCSR,R1                ; R1 CONTAINS BASE KMC ADDRESS.
 1775  004356  000002                          RTI
 1776  004360  000406                  BRW:    .WORD   406
 1777  004362  000020                  $MXCNT: 20                      ;;MAX. NUMBER OF ITERATIONS
 1778
 1779                                          ;CHECK FOR FREEZE ON CURRENT DATA
 1780                                          ;-------------------------------
 1781
 1782  004364  004737  011340          .SCOP1: JSR     PC,CKSWR                ;CHECK FOR SOFT SWR
 1783  004370  032777  001000  174642          BIT     #SW09,@SWR      ;IS SW09=1(SET)?
 1784  004376  001405                          BEQ     1$              ;BR IF NOT SET.
 1785  004400  005737  001444                  TST     LOCK
 1786  004404  001402                          BEQ     1$
 1787  004406  013716  001444                  MOV     LOCK,(SP)       ;GOTO THE ADDRESS IN LOCK.
 1788  004412  000002                  1$:     RTI                     ;GO BACK.
 1789
 1790                                          ;TELETYPE OUTPUT ROUTINE
 1791                                          ;----------------------
 1792
 1793                                  .SBTTL  TYPE ROUTINE
 1794
 1795                                  ;;**********************************************************************
 1796                                  ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
 1797                                  ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
 1798                                  ;*NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
 1799                                  ;*NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
 1800                                  ;*NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
 1801                                  ;*
 1802                                  ;*CALL:
 1803                                  ;*1) USING A TRAP INSTRUCTION
 1804                                  ;*      TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
 1805                                  ;*OR
 1806                                  ;*      TYPE
 1807                                  ;*      MESADR
 1808                                  ;*
 1809
 1810  004414  105737  001257          $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
 1811  004420  100002                          BPL     1$              ;;BR IF YES
 1812  004422  000000                          HALT                    ;;HALT HERE IF NO TERMINAL
 1813  004424  000430                          BR      3$              ;;LEAVE
 1814  004426  010046                  1$:     MOV     R0,-(SP)        ;;SAVE R0
 1815  004430  017600  000002                  MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
```

```
1816  004434  122737  000001  001336          CMPB    #APTENV,$ENV      ;;RUNNING IN APT MODE
1817  004442  001011                          BNE     62$               ;;NO,GO CHECK FOR APT CONSOLE
1818  004444  132737  000100  001337          BITB    #APTSPOOL,$ENVM   ;;SPOOL MESSAGE TO APT
1819  004452  001405                          BEQ     62$               ;;NO,GO CHECK FOR CONSOLE
1820  004454  010037  004464                  MOV     R0,61$            ;;SETUP MESSAGE ADDRESS FOR APT
1821  004460  004737  004704                  JSR     PC,$ATY3          ;;SPOOL MESSAGE TO APT
1822  004464  000000                  61$:    .WORD   0                 ;;MESSAGE ADDRESS
1823  004466  132737  000040  001337  62$:    BITB    #APTCSUP,$ENVM    ;;APT CONSOLE SUPPRESSED
1824  004474  001003                          BNE     60$               ;;YES,SKIP TYPE OUT
1825  004476  112046                  2$:     MOVB    (R0)+,-(SP)       ;;PUSH CHARACTER TO BE TYPED ONTO STACK
1826  004500  001005                          BNE     4$                ;;BR IF IT ISN'T THE TERMINATOR
1827  004502  005726                          TST     (SP)+             ;;IF TERMINATOR POP IT OFF THE STACK
1828  004504  012600                  60$:    MOV     (SP)+,R0          ;;RESTORE R0
1829  004506  062716  000002          3$:     ADD     #2,(SP)           ;;ADJUST RETURN PC
1830  004512  000002                          RTI                       ;;RETURN
1831  004514  122716  000011          4$:     CMPB    #HT,(SP)          ;;BRANCH IF <HT>
1832  004520  001430                          BEQ     8$
1833  004522  122716  000200                  CMPB    #CRLF,(SP)        ;;BRANCH IF NOT <CRLF>
1834  004526  001006                          BNE     5$
1835  004530  005726                          TST     (SP)+             ;;POP  <CR><LF> EQUIV
1836  004532  104401                          TYPE                      ;;TYPE A CR AND LF
1837  004534  001313                          $CRLF
1838  004536  105037  004672                  CLRB    $CHARCNT          ;;CLEAR CHARACTER COUNT
1839  004542  000755                          BR      2$                ;;GET NEXT CHARACTER
1840  004544  004737  004626          5$:     JSR     PC,$TYPEC         ;;GO TYPE THIS CHARACTER
1841  004550  123726  001256          6$:     CMPB    $FILLC,(SP)+      ;;IS IT TIME FOR FILLER CHARS.?
1842  004554  001350                          BNE     2$                ;;IF NO GO GET NEXT CHAR.
1843  004556  013746  001254                  MOV     $NULL,-(SP)       ;;GET # OF FILLER CHARS. NEEDED
1844                                                                    ;;AND THE NULL CHAR.
1845  004562  105366  000001          7$:     DECB    1(SP)             ;;DOES A NULL NEED TO BE TYPED?
1846  004566  002770                          BLT     6$                ;;BR IF NO--GO POP THE NULL OFF OF STACK
1847  004570  004737  004626                  JSR     PC,$TYPEC         ;;GO TYPE A NULL
1848  004574  105337  004672                  DECB    $CHARCNT          ;;DO NOT COUNT AS A COUNT
1849  004600  000770                          BR      7$                ;;LOOP
1850
1851                                  ;HORIZONTAL TAB PROCESSOR
1852
1853  004602  112716  000040          8$:     MOVB    #' ,(SP)          ;;REPLACE TAB WITH SPACE
1854  004606  004737  004626          9$:     JSR     PC,$TYPEC         ;;TYPE A SPACE
1855  004612  132737  000007  004672          BITB    #7,$CHARCNT       ;;BRANCH IF NOT AT
1856  004620  001372                          BNE     9$                ;;TAB STOP
1857  004622  005726                          TST     (SP)+             ;;POP SPACE OFF STACK
1858  004624  000724                          BR      2$                ;;GET NEXT CHARACTER
1859  004626  105777  174416          $TYPEC: TSTB    @$TPS             ;;WAIT UNTIL PRINTER IS READY
1860  004632  100375                          BPL     $TYPEC
1861  004634  116677  000002  174410          MOVB    2(SP),@$TPB       ;;LOAD CHAR TO BE TYPED INTO DATA REG.
1862  004642  122766  000015  000002          CMPB    #CR,2(SP)         ;;IS CHARACTER A CARRIAGE RETURN?
1863  004650  001003                          BNE     1$                ;;BRANCH IF NO
1864  004652  105037  004672                  CLRB    $CHARCNT          ;;YES--CLEAR CHARACTER COUNT
1865  004656  000406                          BR      $TYPEX            ;;EXIT
1866  004660  122766  000012  000002  1$:     CMPB    #LF,2(SP)         ;;IS CHARACTER A LINE FEED?
1867  004666  001402                          BEQ     $TYPEX            ;;BRANCH IF YES
1868  004670  105227                          INCB    (PC)+             ;;COUNT THE CHARACTER
1869  004672  000000          $CHARCNT:.WORD  0                         ;;CHARACTER COUNT STORAGE
1870  004674  000207          $TYPEX: RTS     PC
1871
```

```
                                        .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
```

```
 1928          000040                  APTCSUP=040
 1929                                          ;-------------------------
 1930
 1931                                  .SBTTL  TTY INPUT ROUTINE
 1932
 1933                                  ;;******************************************************************
 1934                                  .ENABL  LSB
 1935
 1936                                  .DSABL  LSB
 1937
 1938
 1939                                  ;;******************************************************************
 1940                                  ;*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
 1941                                  ;*CALL:
 1942                                  ;*      RDCHR                   ;;INPUT A SINGLE CHARACTER FROM THE TTY
 1943                                  ;*      RETURN HERE             ;;CHARACTER IS ON THE STACK
 1944                                  ;*                              ;;WITH PARITY BIT STRIPPED OFF
 1945                                  ;
 1946
 1947  005144  011646                  $RDCHR: MOV     (SP),-(SP)      ;;PUSH DOWN THE PC
 1948  005146  016666  000004  000002          MOV     4(SP),2(SP)     ;;SAVE THE PS
 1949  005154  105777  174064          1$:     TSTB    @$TKS           ;;WAIT FOR
 1950  005160  100375                          BPL     1$              ;;A CHARACTER
 1951  005162  117766  174060  000004        MOVB    @$TKB,4(SP)     ;;READ THE TTY
 1952  005170  042766  177600  000004        BIC     #^C<177>,4(SP)  ;;GET RID OF JUNK IF ANY
 1953  005176  026627  000004  000023        CMP     4(SP),#23       ;;IS IT A CONTROL-S?
 1954  005204  001013                        BNE     3$              ;;BRANCH IF NO
 1955  005206  105777  174032          2$:     TSTB    @$TKS           ;;WAIT FOR A CHARACTER
 1956  005212  100375                          BPL     2$              ;;LOOP UNTIL ITS THERE
 1957  005214  117746  174026                MOVB    @$TKB,-(SP)     ;;GET CHARACTER
 1958  005220  042716  177600                BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
 1959  005224  022627  000021                CMP     (SP)+,#21       ;;IS IT A CONTROL-Q?
 1960  005230  001366                        BNE     2$              ;;IF NOT DISCARD IT
 1961  005232  000750                        BR      1$              ;;YES, RESUME
 1962  005234  026627  000004  000140  3$:     CMP     4(SP),#140      ;;IS IT UPPER CASE?
 1963  005242  002407                        BLT     4$              ;;BRANCH IF YES
 1964  005244  026627  000004  000175        CMP     4(SP),#175      ;;IS IT A SPECIAL CHAR?
 1965  005252  003003                        BGT     4$              ;;BRANCH IF YES
 1966  005254  042766  000040  000004        BIC     #40,4(SP)       ;;MAKE IT UPPER CASE
 1967  005262  000002                  4$:     RTI                     ;;GO BACK TO USER
 1968                                  ;;******************************************************************
 1969                                  ;*THIS ROUTINE WILL INPUT A STRING FROM THE TTY
 1970                                  ;*CALL:
 1971                                  ;*      RDLIN                   ;;INPUT A STRING FROM THE TTY
 1972                                  ;*      RETURN HERE             ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
 1973                                  ;*                              ;;TERMINATOR WILL BE A BYTE OF ALL 0'S
 1974
 1975  005264  010346                  $RDLIN: MOV     R3,-(SP)        ;;SAVE R3
 1976  005266  005046                          CLR     -(SP)           ;;CLEAR THE RUBOUT KEY
 1977  005270  012703  005520          1$:     MOV     #$TTYIN,R3      ;;GET ADDRESS
 1978  005274  022703  005527          2$:     CMP     #$TTYIN+7,R3    ;;BUFFER FULL?
 1979  005300  101456                          BLOS    4$              ;;BR IF YES
 1980  005302  104402                          RDCHR                   ;;GO READ ONE CHARACTER FROM THE TTY
 1981  005304  112613                          MOVB    (SP)+,(R3)      ;;GET CHARACTER
 1982  005306  122713  000177          10$:    CMPB    #177,(R3)       ;;IS IT A RUBOUT
 1983  005312  001022                          BNE     5$              ;;BR IF NO
```

```
1984  005314  005716                          TST     (SP)            ;;IS THIS THE FIRST RUBOUT?
1985  005316  001007                          BNE     6$              ;;BR IF NO
1986  005320  112737  000134  005516          MOVB    #'\,9$          ;;TYPE A BACK SLASH
1987  005326  104401  005516                  TYPE    ,9$
1988  005332  012716  177777                  MOV     #-1,(SP)        ;;SET THE RUBOUT KEY
1989  005336  005303                  6$:     DEC     R3              ;;BACKUP BY ONE
1990  005340  020327  005520                  CMP     R3,#$TTYIN      ;;STACK EMPTY?
1991  005344  103434                          BLO     4$              ;;BR IF YES
1992  005346  111337  005516                  MOVB    (R3),9$         ;;SETUP TO TYPEOUT THE DELETED CHAR.
1993  005352  104401  005516                  TYPE    ,9$             ;;GO TYPE
1994  005356  000746                          BR      2$              ;;GO READ ANOTHER CHAR.
1995  005360  005716                  5$:     TST     (SP)            ;;RUBOUT KEY SET?
1996  005362  001406                          BEQ     7$              ;;BR IF NO
1997  005364  112737  000134  005516          MOVB    #'\,9$          ;;TYPE A BACK SLASH
1998  005372  104401  005516                  TYPE    ,9$
1999  005376  005016                          CLR     (SP)            ;;CLEAR THE RUBOUT KEY
2000  005400  122713  000025          7$:     CMPB    #25,(R3)        ;;IS CHARACTER A CTRL U?
2001  005404  001003                          BNE     8$              ;;BR IF NO
2002  005406  104401  005527                  TYPE    ,$CNTLU         ;;TYPE A CONTROL ''U''
2003  005412  000726                          BR      1$              ;;GO START OVER
2004  005414  122713  000022          8$:     CMPB    #22,(R3)        ;;IS CHARACTER A ''^R''?
2005  005420  001011                          BNE     3$              ;;BRANCH IF NO
2006  005422  105013                          CLRB    (R3)            ;;CLEAR THE CHARACTER
2007  005424  104401  001313                  TYPE    ,$CRLF          ;;TYPE A ''CR'' & ''LF''
2008  005430  104401  005520                  TYPE    ,$TTYIN         ;;TYPE THE INPUT STRING
2009  005434  000717                          BR      2$              ;;GO PICKUP ANOTHER CHACTER
2010  005436  104401  001312          4$:     TYPE    ,$QUES          ;;TYPE A '?'
2011  005442  000712                          BR      1$              ;;CLEAR THE BUFFER AND LOOP
2012  005444  111337  005516          3$:     MOVB    (R3),9$         ;;ECHO THE CHARACTER
2013  005450  104401  005516                  TYPE    ,9$
2014  005454  122723  000015                  CMPB    #15,(R3)+       ;;CHECK FOR RETURN
2015  005460  001305                          BNE     2$              ;;LOOP IF NOT RETURN
2016  005462  105063  177777                  CLRB    -1(R3)          ;;CLEAR RETURN (THE 15)
2017  005466  104401  001314                  TYPE    ,$LF            ;;TYPE A LINE FEED
2018  005472  005726                          TST     (SP)+           ;;CLEAN RUBOUT KEY FROM THE STACK
2019  005474  012603                          MOV     (SP)+,R3        ;;RESTORE R3
2020  005476  011646                          MOV     (SP),-(SP)      ;;ADJUST THE STACK AND PUT ADDRESS OF THE
2021  005500  016666  000004  000002          MOV     4(SP),2(SP)     ;;      FIRST ASCII CHARACTER ON IT
2022  005506  012766  005520  000004          MOV     #$TTYIN,4(SP)
2023  005514  000002                          RTI                     ;;RETURN
2024  005516     000                  9$:     .BYTE   0               ;;STORAGE FOR ASCII CHAR. TO TYPE
2025  005517     000                          .BYTE   0               ;;TERMINATOR
2026  005520  000007                  $TTYIN: .BLKB   7               ;;RESERVE 7 BYTES FOR TTY INPUT
2027  005527     136  006525  000012  $CNTLU: .ASCIZ  /^U/<15><12>    ;;CONTROL ''U''
2028  005534  043536  005015     000  $CNTLG: .ASCIZ  /^G/<15><12>    ;;CONTROL ''G''
2029  005541     015  051412  051127  $MSWR:  .ASCIZ  <15><12>/SWR = /
2030  005546  036440  000040
2031  005552  020040  042516  020127  $MNEW:  .ASCIZ  /  NEW = /
2032  005560  020075     000
2033          005564                  .EVEN
2034                                  .SBTTL  READ AN OCTAL NUMBER FROM THE TTY
2035
2036                                  ;;**************************************************************************
2037                                  ;*THIS ROUTINE WILL READ AN OCTAL (ASCII) NUMBER FROM THE TTY AND
2038                                  ;*CHANGE IT TO BINARY.
2039                                  ;*THE INPUT CHARACTERS WILL BE CHECKED TO INSURED THEY ARE LEGAL
```

```
                        ;*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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2096  005746  012537  006054          MOV     (R5)+,WHERE             ; GET ADDRESS OF INBUFFER
2097  005752  112537  006056          MOVB    (R5)+,LOBITS            ; GET LOWMASK BITS.
2098  005756  112537  006057          MOVB    (R5)+,ADRCNT            ; GET # OF #'S TO BE GENERATED.
2099  005762  010566  000002          MOV     R5,2(SP)                ; SAVE THE RETURN ADDRESS.
2100  005766  104401          INLP1:  TYPE                            ; TYPE THE MESSAGE.
2101  005770  000000          WHAT:   .WORD   0
2102  005772  104404                  RDOCT                           ; READ OCTAL # FROM KEYBOARD.
2103  005774  021637  006052          CMP     (SP),HILIM              ; IS IT IN HIGH LIMIT?
2104  006000  003003                  BGT     2$                      ; BRANCH IF NO.
2105  006002  021637  006050          CMP     (SP),LOLIM              ; IS IT MORE THAN LOW LIMIT.
2106  006006  002005                  BGE     3$                      ; BRANCH IF YES.
2107  006010  104401  001312  2$:     TYPE    ,$QUES                  ; TYPE  '' ? ''
2108  006014  104401  001313          TYPE    ,$CRLF                  ; TYPE <CR>,<LF>
2109  006020  000762                  BR      INLP1                   ;
2110  006022  013705  006054  3$:     MOV     WHERE,R5                ; GET BUFFER ADDRESS.
2111  006026  011625          4$:     MOV     (SP),(R5)+              ; SAVE THE # IN RIGHT PLACE.
2112  006030  062716  000002          ADD     #2,(SP)                 ; NEXT SEQUENTIAL NUMBER.
2113  006034  105337  006057          DECB    ADRCNT                  ; COUNT BY 1.
2114  006040  001372                  BNE     4$                      ; BRANCH IF NOT DONE.
2115  006042  005726                  TST     (SP)+                   ; POP THE STACK POINTER.
2116  006044  012605                  MOV     (SP)+,R5                ; POP THE REG.5
2117  006046  000002                  RTI
2118  006050  000000          LOLIM:  .WORD   0
2119  006052  000000          HILIM:  .WORD   0
2120  006054  000000          WHERE:  .WORD   0
2121  006056     000          LOBITS: .BYTE   0
2122  006057     000          ADRCNT: .BYTE   0
2123
2124                                  ;  ADVANCE TO NEXT TEST HANDLER
2125                                  ;--------------------------------
2126                                  ;
2127  006060  013716  001442  .ADVANCE:        MOV     NEXT,(SP)               ; CRUNCH STACK WITH ADDRESSOF SCOPE CALL
2128  006064  005037  001444          CLR     LOCK                    ; RESET TIGHT LOOP ADDRESS
2129  006070  000002                  RTI                             ; CHECK TO SEE IF OLD TEST GETS REPEATED
2130
2131                                  ;SAVE PC OF TEST THAT FAILED AND R0-R5
2132                                  ;-------------------------------------
2133
2134  006072  016637  000004  001460  .SAV05: MOV     4(SP),SAVPC     ;SAVE R7 (PC)
2135
2136                                  ;SAVE R0-R5
2137
2138  006100  010537  001274  SV05:   MOV     R5,$REG5        ;SAVE R5
2139  006104  010437  001272          MOV     R4,$REG4        ;SAVE R4
2140  006110  010337  001270          MOV     R3,$REG3        ;SAVE R3
2141  006114  010237  001266          MOV     R2,$REG2        ;SAVE R2
2142  006120  010137  001264          MOV     R1,$REG1        ;SAVE R1
2143  006124  010037  001262          MOV     R0,$REG0        ;SAVE R0
2144  006130  000002                  RTI                     ;LEAVE.
2145
2146                                  ;RESTORE R0-R5
2147
2148  006132  013700  001262  .RES05: MOV     $REG0,R0        ;RESTORE R0
2149  006136  013701  001264          MOV     $REG1,R1        ;RESTORE R1
2150  006142  013702  001266          MOV     $REG2,R2        ;RESTORE R2
2151  006146  013703  001270          MOV     $REG3,R3        ;RESTORE R3
```

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2152  006152  013704  001272                  MOV     $REG4,R4        ;RESTORE R4
2153  006156  013705  001274                  MOV     $REG5,R5        ;RESTORE R5
2154  006162  000002                           RTI                     ;LEAVE
2155
2156                                    ;       ;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER
2157                                    ;       ;-----------------------------------------------------
2158                                    ;
2159  006164  104401  001313          .CONVR: TYPE    ,$CRLF
2160  006170  010046                  .CNVRT: MOV     R0,-(SP)
2161  006172  010146                          MOV     R1,-(SP)
2162  006174  010346                          MOV     R3,-(SP)
2163  006176  010446                          MOV     R4,-(SP)
2164  006200  010546                          MOV     R5,-(SP)
2165  006202  017601  000012                  MOV     @12(SP),R1
2166  006206  062766  000002  000012          ADD     #2,12(SP)
2167  006214  012137  006406                  MOV     (R1)+,WRDCNT
2168  006220  112137  006410          1$:     MOVB    (R1)+,CHRCNT
2169  006224  112137  006411                  MOVB    (R1)+,SPACNT
2170  006230  013137  006412                  MOV     @(R1)+,BINWRD
2171  006234  122737  000003  006410          CMPB    #3,CHRCNT
2172  006242  001003                          BNE     2$
2173  006244  042737  177400  006412          BIC     #177400,BINWRD
2174  006252  013704  006412          2$:     MOV     BINWRD,R4
2175  006256  113705  006410                  MOVB    CHRCNT,R5
2176  006262  012700  011234                  MOV     #TEMP,R0
2177  006266  010403                  3$:     MOV     R4,R3
2178  006270  042703  177770                  BIC     #177770,R3
2179  006274  062703  000060                  ADD     #060,R3
2180  006300  110320                          MOVB    R3,(R0)+
2181  006302  000241                          CLC
2182  006304  006004                          ROR     R4
2183  006306  000241                          CLC
2184  006310  006004                          ROR     R4
2185  006312  000241                          CLC
2186  006314  006004                          ROR     R4
2187  006316  005305                          DEC     R5
2188  006320  001362                          BNE     3$
2189  006322  012703  011276                  MOV     #MDATA,R3
2190  006326  114023                  4$:     MOVB    -(R0),(R3)+
2191  006330  105337  006410                  DECB    CHRCNT
2192  006334  001374                          BNE     4$
2193  006336  105737  006411                  TSTB    SPACNT
2194  006342  001405                          BEQ     6$
2195  006344  112723  000040          5$:     MOVB    #040,(R3)+
2196  006350  105337  006411                  DECB    SPACNT
2197  006354  001373                          BNE     5$
2198  006356  105013                  6$:     CLRB    (R3)
2199  006360  104401  011276                  TYPE    ,MDATA
2200  006364  005337  006406                  DEC     WRDCNT
2201  006370  001313                          BNE     1$
2202  006372  012605                          MOV     (SP)+,R5
2203  006374  012604                          MOV     (SP)+,R4
2204  006376  012603                          MOV     (SP)+,R3
2205  006400  012601                          MOV     (SP)+,R1
2206  006402  012600                          MOV     (SP)+,R0
2207  006404  000002                          RTI
```

```
2208  006406  000000                  WRDCNT: 0
2209  006410  000000                  CHRCNT: 0
2210          006411                  SPACNT=CHRCNT+1
2211  006412  000000                  BINWRD: 0
2212
2213
2214                                          ;TRAP DISPATCH SERVICE
2215                                          ;ARGUMENT OF TRAP IS EXTRACTED
2216                                          ;AND USED AS OFFSET TO OBTAIN POINTER
2217                                          ;TO SELECTED SUBROUTINE
2218
2219                                  .SBTTL  TRAP DECODER
2220
2221                                  ;;**********************************************************************
2222                                  ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
2223                                  ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
2224                                  ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
2225                                  ;*GO TO THAT ROUTINE.
2226
2227  006414  010046                  $TRAP:  MOV     R0,-(SP)        ;;SAVE R0
2228  006416  016600  000002                 MOV     2(SP),R0        ;;GET TRAP ADDRESS
2229  006422  005740                         TST     -(R0)           ;;BACKUP BY 2
2230  006424  111000                         MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
2231  006426  006300                         ASL     R0              ;;POSITION FOR INDEXING
2232  006430  016000  006450                 MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
2233  006434  000200                         RTS     R0              ;;GO TO ROUTINE
2234
2235
2236                                  ;;THIS IS USE TO HANDLE THE "GETPRI" MACRO
2237
2238  006436  011646                  $TRAP2: MOV     (SP),-(SP)      ;;MOVE THE PC DOWN
2239  006440  016666  000004  000002          MOV     4(SP),2(SP)     ;;MOVE THE PSW DOWN
2240  006446  000002                         RTI                     ;;RESTORE THE PSW
2241
2242                                  .SBTTL  TRAP TABLE
2243
2244                                  ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
2245                                  ;*BY THE "TRAP" INSTRUCTION.
2246
2247                                  ;       ROUTINE
2248                                  ;       -------
2249  006450  006436                  $TRPAD: .WORD   $TRAP2
2250  006452  004414                          $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
2251
2252
2253  006454  005144                          $RDCHR  ;;CALL=RDCHR    TRAP+2(104402)  TTY TYPEIN CHARACTER ROUTINE
2254  006456  005264                          $RDLIN  ;;CALL=RDLIN    TRAP+3(104403)  TTY TYPEIN STRING ROUTINE
2255  006460  005564                          $RDOCT  ;;CALL=RDOCT    TRAP+4(104404)  READ AN OCTAL NUMBER FROM TTY
2256  006462  004364                          .SCOP1  ;;CALL=SCOP1    TRAP+5(104405)  CALL TO LOOP ON CURRENT DATA HANDLER
2257  006464  006072                          .SAV05  ;;CALL=SAV05    TRAP+6(104406)  CALL TO REGISTER SAVE ROUTINE
2258  006466  006132                          .RES05  ;;CALL=RES05    TRAP+7(104407)  CALL TO REGISTER RESTORE ROUTINE
2259  006470  007362                          .MSTCLR ;;CALL=MSTCLR   TRAP+10(104410) CALL TO ISSUE A MASTER CLEAR
2260  006472  007332                          .DELAY  ;;CALL=DELAY    TRAP+11(104411) CALL TO DELAY
2261  006474  007400                          .ROMCLK ;;CALL=ROMCLK   TRAP+12(104412) CALL TO CLOCK ROM ONCE
2262  006476  007446                          .DATACLK        ;;CALL=DATACLK  TRAP+13(104413) CALL TO CLOCK DATA
2263  006500  007512                          .TIMER  ;;CALL=TIMER    TRAP+14(104414) CALL TO DELAY A CLOCK TICK
```

```
 2264  006502  005724                        $INPUT  ;;CALL=INPUT    TRAP+15(104415) CALL TO OCTAL # INPUT ROUTINE
 2265  006504  006164                        .CONVRT ;;CALL=CONVRT   TRAP+16(104416) CALL TO    .....
 2266  006506  006170                        .CNVRT  ;;CALL=CNVRT    TRAP+17(104417) CALL TO    .......
 2267  006510  006060                        .ADVANCE        ;;CALL=ADVANCE  TRAP+20(104420) CALL TO ADVANCE TO NEXT TEST
 2268                                  ;
 2269                                  ;-------------------------------------------------------------
 2270                                  ;;*************************************************************
 2271                                          ;ERROR HANDLER
 2272                                          ;-------------
 2273
 2274  006512  004737  011340        $ERROR: JSR     PC,CKSWR        ;CHECK FOR SOFT SWR
 2275  006516  032777  010000  172514        BIT     #SW12,@SWR      ;BELL ON ERROR?
 2276  006524  001406                        BEQ     XBX             ;BR IF NO BELL
 2277  006526  105777  172516                TSTB    @$TPS           ;TTY READY.
 2278  006532  100003                        BPL     XBX             ;DON'T WAIT IF TTY NOT READY.
 2279  006534  112777  000207  172510        MOVB    #207,@$TPB      ;PUSH A BELL AT THE TTY.
 2280  006542  032777  020000  172470  XBX:  BIT     #SW13,@SWR      ;DELETE ERROR PRINT OUT?
 2281  006550  001107                        BNE     HALTS           ;BR IF NO PRINT OUT WANTED.
 2282  006552  021637  001216                CMP     (SP),$ERRPC     ;WAS THIS ERROR FOUND LAST TIME?
 2283  006556  001404                        BEQ     1$              ;BR IF YES
 2284  006560  011637  001216                MOV     (SP),$ERRPC     ;RECORD BEING HERE
 2285  006564  105037  001203                CLRB    $ERFLG          ;PREPARE HEADER
 2286  006570  104406                  1$:   SAV05                   ;SAVE ALL PROC REGISTERS
 2287  006572  011605                        MOV     (SP),R5         ;GET THE PC OF ERROR
 2288  006574  162705  000002                SUB     #2,R5           ;GET ADDRESS OF TRAP CALL
 2289  006600  011504                        MOV     (R5),R4         ;GET ERROR INSTRUCTION
 2290  006602  110437  001214                MOVB    R4,$ITEMB       ; COPY ERROR # FOR APT HANDLING
 2291  006606  006304                        ASL     R4              ;MULT BY TWO
 2292  006610  061504                        ADD     (R5),R4         ;DOUBLE IT
 2293  006612  006304                        ASL     R4              ;MULT AGAIN
 2294  006614  042704  177001                BIC     #177001,R4      ;CLEAR JUNK
 2295  006620  062704  001512                ADD     #$ERRTB,R4      ;GET POINTER
 2296  006624  012437  006740                MOV     (R4)+,ERRMSG    ;GET ERROR MESSAGE
 2297  006630  012437  006752                MOV     (R4)+,DATAHD    ;GET DATA HEADRER
 2298  006634  011437  006764                MOV     (R4),DATABP     ;GET DATA TABLE
 2299  006640  105737  001203                TSTB    $ERFLG          ;TYPE HEADREER
 2300  006644  001403                        BEQ     TYPMSG          ;BR IF YES
 2301  006646  005737  006764                TST     DATABP          ;DOES DATA TABLE EXIST?
 2302  006652  001040                        BNE     TYPDAT          ;BR IF YES.
 2303  006654  104401  001313        TYPMSG: TYPE    ,$CRLF
 2304  006660  104401  001313                TYPE    ,$CRLF
 2305  006664  005737  001444                TST     LOCK
 2306  006670  001402                        BEQ     1$
 2307  006672  104401  010016                TYPE    ,MASTEK
 2308  006676  104401  010004          1$:   TYPE    ,MTSTN
 2309  006702  104417  007120                CNVRT   ,XTSTN          ;SHOW IT
 2310  006706  104401  010073                TYPE    ,MERRPC         ;TYPE PC.
 2311  006712  104417  007112                CNVRT   ,ERTABO         ;SHOW IT
 2312  006716  104401  001313                TYPE    ,$CRLF          ;GIVE A CR/LF
 2313  006722  112737  177777  001203        MOVB    #-1,$ERFLG      ;NO MORE HEADER UNLESS NO DATA TABLE.
 2314  006730  005737  006740                TST     ERRMSG          ;IS THERE AN ERROR MESSAGE?
 2315  006734  001402                        BEQ     WRKO.FM         ;BR IF NO.
 2316  006736  104401                        TYPE                    ;TYPE
 2317  006740  000000                ERRMSG: 0                       ;    ERROR MESSAGE
 2318  006742                         WRKO.FM:                       ;
 2319  006742  005737  006752                TST     DATAHD          ;DATA HEADER?
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2320  006746  001402                        BEQ     TYPDAT          ;BR IF NO
2321  006750  104401                        TYPE                    ;TYPE
2322  006752  000000              DATAHD:   0                       ;    DATA HEADER
2323  006754  005737  006764      TYPDAT:   TST     DATABP          ;DATA TABLE?
2324  006760  001402                        BEQ     RESREG          ;BR IF NO.
2325  006762  104416                        CONVRT                  ;SHOW
2326  006764  000000              DATABP:   0                       ;    DATA TABLE
2327  006766  104407              RESREG:   RES05                   ;RESTORE PROC REGISTERS
2328  006770  122737  000001  001336  HALTS:    CMPB    #APTENV,$ENV    ; IS APT RUNNING ?
2329  006776  001007                        BNE     3$              ; SKIP APT CALL IF NOT.
2330  007000  113737  001214  007012        MOVB    $ITEMB,6$       ; COPY ERROR #.
2331  007006  004737  004714                JSR     PC,$ATY4        ; CALL APT SERVICES.
2332  007012  000000              6$:       .WORD   0               ; ERROR # GOES HERE.
2333  007014  000777              9$:       BR      9$              ; LOCK HERE.
2334  007016  022737  004070  000042  3$:       CMP     #$ENDAD,@#42    ;IF ACT-11 AUTOMATIC MODE, HALT!!
2335  007024  001403                        BEQ     1$
2336  007026  005777  172206                TST     @SWR            ;HALT ON ERROR?
2337  007032  100005                        BPL     EXITER          ;BR IF NO HALT ON ERROR
2338  007034  010046              1$:       PUSHR0                  ;SAVE R0
2339  007036  016600  000002                MOV     2(SP),R0        ;SHOW ERROR PC IN DATA LIGHTS
2340  007042  000000                        HALT                    ;HALT
2341  007044  012600                        POPR0                   ;GET R0
2342  007046  005237  001212      EXITER:   INC     $ERTTL          ;UPDATE ERROR COUNT
2343  007052  032777  000400  172160        BIT     #SW08,@SWR      ;GOTO TOP OF TEST?
2344  007060  001007                        BNE     1$              ;BR IF YES
2345  007062  032777  002000  172150        BIT     #SW10,@SWR      ;GOTO NEXT TEST?
2346  007070  001407                        BEQ     2$              ;BR IF NO
2347  007072  013737  001442  001206        MOV     NEXT,$LPADR     ;SET FOR NEXT TEST
2348  007100  012706  001200              1$:       MOV     #STACK,SP       ;RESET SP
2349  007104  000177  172076                JMP     @$LPADR         ;GOTO SPECIFIED TEST
2350  007110  000002              2$:       RTI                     ;$LPADR
2351  007112  000001              ERTABO:   1
2352  007114     006      002              .BYTE   6,2
2353  007116  001460                        SAVPC
2354  007120  000001              XTSTN:    1
2355  007122     003      002              .BYTE   3,2
2356  007124  001202                        $TSTNM
2357                                        ;ENTER HERE ON POWER FAILURE
2358                                        ;--------------------------
2359
2360                                  .SBTTL  POWER DOWN AND UP ROUTINES
2361
2362                                  ;;**********************************************************************
2363                                  ;POWER DOWN ROUTINE
2364  007126  012737  007316  000024  $PWRDN:  MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST UP
2365  007134  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;PRIO:7
2366  007142  010046                         MOV     R0,-(SP)        ;;PUSH R0 ON STACK
2367  007144  010146                         MOV     R1,-(SP)        ;;PUSH R1 ON STACK
2368  007146  010246                         MOV     R2,-(SP)        ;;PUSH R2 ON STACK
2369  007150  010346                         MOV     R3,-(SP)        ;;PUSH R3 ON STACK
2370  007152  010446                         MOV     R4,-(SP)        ;;PUSH R4 ON STACK
2371  007154  010546                         MOV     R5,-(SP)        ;;PUSH R5 ON STACK
2372  007156  017746  172056                 MOV     @SWR,-(SP)      ;;PUSH @SWR ON STACK
2373  007162  010637  007322                 MOV     SP,$SAVR6       ;;SAVE SP
2374  007166  012737  007200  000024         MOV     #$PWRUP,@#PWRVEC ;;SET UP VECTOR
2375  007174  000000                         HALT
```

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2376  007176  000776                        BR      .-2             ;;HANG UP
2377
2378                                  ;;*****************************************************************
2379                                  ;POWER UP ROUTINE
2380  007200  012737  007316  000024  $PWRUP: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST DOWN
2381  007206  013706  007322                  MOV     $SAVR6,SP       ;;GET SP
2382  007212  005037  007322                  CLR     $SAVR6          ;;WAIT LOOP FOR THE TTY
2383  007216  005237  007322          1$:     INC     $SAVR6          ;;WAIT FOR THE INC
2384  007222  001375                          BNE     1$              ;;OF  WORD
2385  007224  104401  007562                  TYPE    ,MPFAIL         ;
2386  007230  104417  007324                  CNVRT   ,PFTAB          ;
2387  007234  105037  001203                  CLRB    $ERFLG          ;CLEAR ERROR FLAG.
2388  007240  005037  001216                  CLR     $ERRPC          ; CLEAR LAST ERROR PC
2389  007244  013701  002066                  MOV     KMCSR,R1        ; RESTORE DEVICE ADDRESS.
2390  007250  005011                          CLR     (R1)            ; CLEAR THE CSR.
2391  007252  104410                          MSTCLR                  ;
2392  007254  012677  171760                  MOV     (SP)+,@SWR      ;;POP STACK INTO @SWR
2393  007260  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
2394  007262  012604                          MOV     (SP)+,R4        ;;POP STACK INTO R4
2395  007264  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
2396  007266  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
2397  007270  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
2398  007272  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
2399  007274  012737  007126  000024          MOV     #$PWRDN,@#PWRVEC ;;SET UP THE POWER DOWN VECTOR
2400  007302  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;PRIO:7
2401  007310  104401                          TYPE                    ;;REPORT THE POWER FAILURE
2402  007312  007562                  $PWRMG: .WORD   MPFAIL          ;;POWER FAIL MESSAGE POINTER
2403  007314  000002                          RTI
2404  007316  000000                  $ILLUP: HALT                    ;;THE POWER UP SEQUENCE WAS STARTED
2405  007320  000776                          BR      .-2             ;; BEFORE THE POWER DOWN WAS COMPLETE
2406  007322  000000                  $SAVR6: 0                       ;;PUT THE SP HERE
2407
2408  007324  000001                  PFTAB:  1
2409  007326     003     002          .BYTE   3,2
2410  007330  001202                          $TSTNM
2411
2412  007332                          .DELAY:
2413  007332  012777  000020  172534          MOV     #20,@KMP04
2414  007340  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2415  007342  121111                          121111                  ;POKE CLOCK DELAY BIT
2416  007344                          1$:
2417  007344  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2418  007346  121224                          121224                  ;PORT4 IBUS*11
2419  007350  032777  000020  172516          BIT     #BIT4,@KMP04    ;IS CLOCK BIT SET?
2420  007356  001772                          BEQ     1$              ;BR IF NO
2421  007360  000002                          RTI
2422
2423  007362                          .MSTCLR:
2424  007362  152777  000100  172500          BISB    #BIT6,@KMCSRH   ;SET MASTER CLEAR
2425  007370  142777  000300  172472          BICB    #BIT6!BIT7,@KMCSRH  ;CLEAR MASTER CLEAR AND RUN
2426  007376  000002                          RTI                     ;RETURN
2427
2428  007400                          .ROMCLK:
2429  007400  152777  000002  172462          BISB    #BIT1,@KMCSRH   ;SET ROMI
2430  007406  013677  172464                  MOV     @(SP)+,@KMP06   ;LOAD INSTRUCTION IN SEL6
2431  007412  062746  000002                  ADD     #2,-(SP)        ;ADJUST STACK
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 2432  007416  032777  000100  171614          BIT     #SW06,@SWR      ;HALT IF SW06 =1
 2433  007424  001401                          BEQ     1$              ;BR IF SW06 =0
 2434  007426  000000                          HALT                    ;HALT BEFORE CLOCKING INSTRUCTION
 2435  007430  152777  000003  172432  1$:     BISB    #BIT1!BIT0,@KMCSRH ;CLOCK INSTRUCTION
 2436  007436  142777  000007  172424          BICB    #BIT2!BIT1!BIT0,@KMCSRH  ;CLEAR ROMO, ROMI, STEP
 2437  007444  000002                          RTI
 2438
 2439  007446                          .DATACLK:
 2440  007446  013637  011234                  MOV     @(SP)+,TEMP     ;PUT TICK COUNT IN TEMP
 2441  007452  062746  000002                  ADD     #2,-(SP)        ;ADJUST STACK
 2442  007456  152777  000020  172404  1$:     BISB    #BIT4,@KMCSRH   ;SET STEP LU
 2443  007464  027777  172376  172374          CMP     @KMCSR,@KMCSR   ;WASTE TIME
 2444  007472  142777  000020  172370          BICB    #BIT4,@KMCSRH   ;CLEAR STEP LU
 2445  007500  005337  011234                  DEC     TEMP            ;DEC TICK COUNT
 2446  007504  001364                          BNE     1$              ;BR IF NOT DONE
 2447  007506  000002                          RTI                     ;RETURN
 2448  007510  000001                  3$:     .BLKW 1
 2449
 2450  007512                          .TIMER:
 2451  007512  013637  011234                  MOV     @(SP)+,TEMP     ;MOVE COUNT TO TEMP
 2452  007516  062746  000002                  ADD     #2,-(SP)        ;ADJUST STACK
 2453  007522                          1$:
 2454  007522  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 2455  007524  021364                          021364                  ;PORT4 IBUS* REG11
 2456  007526  032777  000002  172340          BIT     #2,@KMP04       ;IS PGM CLOCK BIT CLEAR?
 2457  007534  001772                          BEQ     1$              ;BR IF YES
 2458  007536                          2$:
 2459  007536  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 2460  007540  021364                          021364                  ;PORT4 IBUS* REG11
 2461  007542  032777  000002  172324          BIT     #2,@KMP04       ;IS PGM CLOCK BIT SET?
 2462  007550  001372                          BNE     2$              ;BR IF YES
 2463  007552  005337  011234                  DEC     TEMP            ;DEC COUNT
 2464  007556  001361                          BNE     1$              ;BR IF NOT DONE
 2465  007560  000002                          RTI                     ;RETURN
 2466
 2467  007562  050200  051127  043040  MPFAIL: .ASCIZ  <200>/PWR FAILED. RESTART AT TEST /
  (2)  007620  042600  042116  050040  MEPASS: .ASCIZ  <200>/END PASS CZCKEB  /
  (2)  007643     200  000122          MR:     .ASCIZ  <200>/R/
  (2)  007646  047200  020117  042504  MERR2:  .ASCIZ  <200>/NO DEVICES PRESENT./
  (2)  007673     200  047111  052523  MERR3:  .ASCIZ  <200>/INSUFFICIENT DATA!/
  (2)  007717     200  047514  045503  MLOCK:  .ASCIZ  <200>/LOCK ON SELECTED TEST/
  (2)  007746  051503  035122  000040  MCSRX:  .ASCIZ   /CSR: /
  (2)  007754  042526  035103  000040  MVECX:  .ASCIZ  /VEC: /
  (2)  007762  040520  051523  051505  MPASSX: .ASCIZ  /PASSES: /
  (2)  007773     105  051122  051117  MERRX:  .ASCIZ  /ERRORS: /
  (2)  010004  042524  052123  047040  MTSTN:  .ASCIZ  /TEST NO: /
  (2)  010016  000052                  MASTEK: .ASCIZ  /*/
  (2)  010020  051600  052105  051440  MNEW:   .ASCIZ  <200>/SET SWITCH REG TO KMC11'S DESIRED ACTIVE./
  (2)  010073     120  035103  000040  MERRPC: .ASCIZ  /PC: /
  (2)  010100  020200  020040  020040  XHEAD:  .ASCII  <200>/            MAP OF KMC11 STATUS/
  (2)  010137     200  020040  020040          .ASCII  <200>/            ------------------/
  (2)  010176  020200  050040  020103          .ASCII  <200>/  PC      CSR     STAT1    STAT2    STAT3/
  (2)  010250  026600  026455  026455          .ASCIZ  <200>/------   ------   ------   ------   ------/
  (2)  010324  044200  053517  046440  NUM:    .ASCIZ  <200>/HOW MANY KMC11'S TO BE TESTED?/
  (2)  010364  041600  051123  040440  CSR:    .ASCIZ  <200>/CSR ADDRESS?/
  (2)  010402  053200  041505  047524  VEC:    .ASCIZ  <200>/VECTOR ADDRESS?/
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   (2)  010423     200  051102  050040  PRIO:   .ASCIZ  <200>/BR PRIORITY LEVEL? (4,5,6,7)?/
   (2)  010462  053600  044510  044103  MODU:   .ASCIZ  <200>/WHICH LINE UNIT? IF NONE TYPE 'N', IF M8201 TYPE '1', IF M8202 TYP
   (2)  010574  053600  044510  044103  MV35:   .ASCII  <200>/WHICH MODEM TYPE, TYPE 'D' FOR KMC11-DA (RS232C),OR/
   (2)  010660  052200  050131  020105          .ASCIZ  <200>/TYPE "F" FOR KMC11-FA (V.35) ? /
   (2)
   (2)  010721     200  053523  052111  LINE:   .ASCIZ  <200>/SWITCH PAC#1 (DDCMP LINE #)?/
   (2)  010757     200  053523  052111  BM:     .ASCIZ  <200>/SWITCH PAC#2 (BM873 BOOT ADD)?/
   (2)  011017     200  051511  052040  CONN:   .ASCIZ  <200>/IS THE LOOP BACK CONNECTOR ON?/
   (2)  011057     200  047516  042040  NOACT:  .ASCIZ  <200>/NO DEVICES ARE SELECTED/
   (2)  011110  100200  046513  030503  CONERR: .ASCIZ  <200><200>/KMC11 AT NONSTANDARD ADDRESS  PC: /
   (2)  011155     200  054105  042520  CNERR:  .ASCIZ  <200>/EXPECTED  FOUND/
   (2)  011176  024040  046513  024503  KMCM:   .ASCIZ  / (KMC) /
   (2)                                  .EVEN
   (2)  011206  000005                  XSTATQ: 5
2468    011210     006     003                  .BYTE   6,3
2469    011212  001276                          $TMP0
2470    011214     006     003                  .BYTE   6,3
2471    011216  001300                          $TMP1
2472    011220     006     003                  .BYTE   6,3
2473    011222  001302                          $TMP2
2474    011224     006     003                  .BYTE   6,3
2475    011226  001304                          $TMP3
2476    011230     006     002                  .BYTE   6,2
2477    011232  001306                          $TMP4
2478                                 .EVEN
2479
2480                                          ;BUFFERS FOR INPUT-OUTPUT
2481
2482    011234  000000                  TEMP:   0
2483            011276                  .=.+40
2484    011276  000000                  MDATA:  0
2485            011340                  .=.+40
2486
2487
2488                                          ;ROUTINE USED TO CHANGE SOFTWARE SWITCH
2489                                          ;REGISTER USING THE CONSOLE TERMINAL
2490                                          ;-------------------------------------
2491
2492    011340  022737  000176  001240  CKSWR:  CMP     #SWREG,SWR      ;IS THE SOFT SWR BEING USED?
2493    011346  001075                          BNE     CKSWR5          ;BR IF NO
2494    011350  132737  000001  001336          BITB    #1,$ENV         ; IS IT RUNNING UNDER APT?
2495    011356  001071                          BNE     CKSWR5          ; EXIT IF YES.
2496    011360  022777  000007  167660          CMP     #7,@$TKB        ;WAS CTRL G TYPED? (7 BIT ASCII)
2497    011366  001404                          BEQ     1$              ;BR IF YES
2498    011370  022777  000207  167650          CMP     #207,@$TKB      ;WAS CTRL G TYPED? (8 BIT ASCII)
2499    011376  001061                          BNE     CKSWR5          ;BR IF NO
2500    011400  010246                  1$:     MOV     R2,-(SP)        ;STORE R2
2501    011402  010346                          MOV     R3,-(SP)        ;STORE R3
2502    011404  010446                          MOV     R4,-(SP)        ;STORE R4
2503    011406  012737  177777  011544          MOV     #-1,SWFLG       ;SET SOFT TYPE OUT FLAG
2504    011414  005002                  CKSWR1: CLR     R2              ;CLEAR NEW SWR CONTENTS
2505    011416  012704  177777                  MOV     #-1,R4          ;SET FLAG TO ALL ONES
2506    011422  104401  005541                  TYPE    ,$MSWR          ;TYPE "SWR= "
2507    011426  104417                  CKSWR2: CNVRT                   ;TYPE OUT PRESENT CONTENTS
2508    011430  011600                          SOFTSW                  ;OF SOFT SWITCH REGISTER
2509    011432  104401  005552          CKSWR3: TYPE    ,$MNEW          ;TYPE "NEW? "
```

```
 2510  011436  004737  011546          CKSWR4: JSR     PC,INCHAR       ;GET RESPONSE
 2511  011442  022703  000015                  CMP     #15,R3          ;WAS IT A CR?
 2512  011446  001424                          BEQ     5$              ;BR IF YES
 2513  011450  022703  000012                  CMP     #12,R3          ;WAS IT A LF?
 2514  011454  001416                          BEQ     4$              ;BR IF YES
 2515  011456  022703  000025                  CMP     #25,R3          ;WAS IT CTRL U?
 2516  011462  001754                          BEQ     CKSWR1          ;BR IF YES(START OVER)
 2517  011464  022703  000007                  CMP     #7,R3           ;IF CNTL G GET NEXT CHAR
 2518  011470  001762                          BEQ     CKSWR4
 2519  011472  005004                          CLR     R4              ;IT MUST BE A DIGIT SO CLR FLAG
 2520  011474  042703  177770                  BIC     #177770,R3      ;ONLY 0-7 ARE LEGAL SO MASK OFF BITS
 2521  011500  006302                          ASL     R2              ;SHIFT R2 3 TIMES
 2522  011502  006302                          ASL     R2
 2523  011504  006302                          ASL     R2
 2524  011506  050302                          BIS     R3,R2           ;ADD LAST DIGIT
 2525  011510  000752                          BR      CKSWR4          ;GET NEXT CHARACTER
 2526  011512  012766  002402  000006  4$:     MOV     #.START,6(SP)   ;LF WAS TYPED SO GO TO START
 2527  011520  005704                  5$:     TST     R4              ;IS FLAG CLEAR?
 2528  011522  001002                          BNE     6$              ;IF NOT DON'T CHANGE SOFT SWR
 2529  011524  010277  167510                  MOV     R2,@SWR         ;IF YES THEN WRITE NEW CONTENTS TO SOFT SWR
 2530  011530  005037  011544          6$:     CLR     SWFLG           ;CLEAR TYPEOUT FLAG
 2531  011534  012604                          MOV     (SP)+,R4        ;RESTORE R4
 2532  011536  012603                          MOV     (SP)+,R3        ;RESTORE R3
 2533  011540  012602                          MOV     (SP)+,R2        ;RESTORE R2
 2534  011542  000207          CKSWR5: RTS     PC                      ;RETURN
 2535
 2536  011544  000000          SWFLG:  0
 2537
 2538  011546  105777  167472  INCHAR: TSTB    @#TKS
 2539  011552  100375                  BPL     .-4
 2540  011554  017703  167466          MOV     @#TKB,R3
 2541  011560  105777  167464          TSTB    @#TPS
 2542  011564  100375                  BPL     .-4
 2543  011566  010377  167460          MOV     R3,@#TPB
 2544  011572  042703  000200          BIC     #BIT7,R3
 2545  011576  000207                  RTS     PC
 2546
 2547  011600  000001          SOFTSW: 1
 2548  011602     006     002          .BYTE   6,2
 2549  011604  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.
                                        ;
011606  005737  001470        CYCLE:  TST     KMACTV          ;ARE ANY KMC11'S TO BE TESTED?
011612  001004                        BNE     1$              ;BR IF OK.
011614  104401  011057                TYPE    ,NOACT          ;NO KMC11'S SELECTED!!
011620  000000                        HALT                    ;STOP THE SHOW.
011622  000776                        BR      .-2             ;DISQUALIFY CONT. SW.
011624  000241                1$:     CLC                     ;CLEAR PROC. CARRY BIT.
011626  006137  001500                ROL     RUN             ;UPDATE POINTER
011632  005537  001500                ADC     RUN             ;CATCH CARRY FROM RUN
011636  062737  000004  001504        ADD     #4,MILK         ;UPDATE POINTER
011644  062737  000010  001502        ADD     #10,CREAM       ;UPDATE ADDRESS POINTER.
011652  022737  002300  001502        CMP     #KM.MAP+200,CREAM
011660  001006                        BNE     2$              ;KEEP GOING; NOT ALL TESTED FOR.
011662  012737  002100  001502        MOV     #KM.MAP,CREAM   ;RESET ADDRESS POINTER.
011670  012737  002302  001504        MOV     #CNT.MAP,MILK   ;RESET PASS COUNT POINTER
011676  033737  001500  001470  2$:   BIT     RUN,KMACTV      ;IS THIS ONE ACTIVE?
011704  001747                        BEQ     1$              ;BR IF NO
011706  013700  001502                MOV     CREAM,R0        ;GET ADDRESS POINTER
011712  013702  001504                MOV     MILK,R2         ;GET PASS COUNT POINTER
011716  012037  002066                MOV     (R0)+,KMCSR     ;LOAD SYSTEM CTRL. REG
011722  011037  002056                MOV     (R0),KMRVEC     ;LOAD VECTOR
011726  042737  177000  002056        BIC     #177000,KMRVEC  ;CLEAR UNWANTED BITS
011734  012037  002050                MOV     (R0)+,STAT1     ;LOAD STAT1
011740  012037  002052                MOV     (R0)+,STAT2     ;LOAD STAT2
011744  012037  002054                MOV     (R0)+,STAT3     ;LOAD STAT3
011750  012237  001324                MOV     (R2)+,$PASS     ;LOAD PASS COUNT
011754  012237  001212                MOV     (R2)+,$ERTTL    ;LOAD ERROR COUNT
011760  012700  000002                MOV     #2,R0           ;SAVE CORE THIS WAY!
011764  013737  002066  002070        MOV     KMCSR,KMCSRH
011772  005237  002070                INC     KMCSRH
011776  013737  002070  002072        MOV     KMCSRH,KMCTL
012004  005237  002072                INC     KMCTL
012010  013737  002072  002074        MOV     KMCTL,KMP04
012016  060037  002074                ADD     R0,KMP04
012022  013737  002074  002076        MOV     KMP04,KMP06
012030  060037  002076                ADD     R0,KMP06

012034  013737  002056  002060        MOV     KMRVEC,KMRLVL   ;PTY LVL
012042  060037  002060                ADD     R0,KMRLVL       ;
012046  013737  002060  002062        MOV     KMRLVL,KMTVEC   ;TX VEC
012054  060037  002062                ADD     R0,KMTVEC       ;
012060  013737  002062  002064        MOV     KMTVEC,KMTLVL   ;TX LVL
012066  060037  002064                ADD     R0,KMTLVL

012072  032737  000002  001446        BIT     #SW01,STRTSW    ;IS TEST NO. SELECTED
012100  001447                        BEQ     7$              ;BR IF NO
012102                          4$:
012102  005737  000042                TST     @#42            ;RUNNING IN AUTO MODE?
```

```
2606  012106  001044                        BNE     7$              ;BR IF YES
2607  012110  104401  001313                TYPE    ,$CRLF
2608  012114  104415                       INPUT
2609  012116  010004                       MTSTN
2610  012120  000001                       1
2611  012122  001000                       1000
2612  012124  001202                       $TSTNM
2613  012126     000              .BYTE   0
2614  012127     001              .BYTE   1
2615  012130  012700  014140              MOV     #TST1,R0
2616  012134  022710              5$:     CMP     (PC)+,(R0)      ;CMP FIRST WORD TO 12737
2617  012136  012737                       MOV     (PC)+,@(PC)+
2618  012140  001020                       BNE     6$              ;BR IF NOT SAME
2619  012142  023760  001202  000002       CMP     $TSTNM,2(R0)    ;DOES $TSTNM MATCH?
2620  012150  001014                       BNE     6$              ;BR IF NO
2621  012152  022760  001202  000004       CMP     #$TSTNM,4(R0)   ;IS LAST WORD OK?
2622  012160  001010                       BNE     6$              ;BR IF NO
2623  012162  010037  001206               MOV     R0,$LPADR       ;IT IS A LEGAL TEST SO DO IT
2624  012166  104401  007643               TYPE    ,MR
2625  012172  042737  000002  001446       BIC     #SW01,STRTSW
2626  012200  000412                       BR      8$
2627  012202  005720              6$:     TST     (R0)+           ;POP R0
2628  012204  020027  027716               CMP     R0,#TLAST+10    ;AT END YET?
2629  012210  001351                       BNE     5$              ;BR IF NO
2630  012212  104401  001312               TYPE    ,$QUES          ;YES ILLEGAL TEST NO.
2631  012216  000731                       BR      4$              ;TRY AGAIN
2632
2633  012220  012737  014140  001206  7$:     MOV     #TST1,$LPADR    ;PREPARE $LPADR ADDRESS
2634  012226  013701  002066          8$:     MOV     KMCSR,R1        ;R1 = BASE KMC11 ADDRESS
2635  012232  000177  166750               JMP     @$LPADR         ;GO START TESTING.
2636
2637
2638                                        ;ROUTINE USED TO "AUTO SIZE" THE KMC11
2639                                        ;CSR AND VECTOR.
2640                                        ;NOTE:  THE CSR MAY BE ANY WHERE IN THE FLOATING
2641                                        ;       ADDRESS RANGE (160000:164000)
2642                                        ;       AND THE VECTOR MAY BE ANY WHERE IN THE
2643                                        ;       FLOATING VECTOR RANGE (300:770)
2644                                        ;
2645
2646  012236                        AUTO.SIZE:
2647  012236  000005                       RESET                   ;INSURE A BUS INIT.
2648  012240  012702  002100        CSRMAP: MOV     #KM.MAP,R2      ;LOAD MAP POINTER.
2649  012244  005022              1$:     CLR     (R2)+           ;ZERO ENTIRE MAP
2650  012246  022702  002300               CMP     #KM.END,R2      ;ALL DONE?
2651  012252  001374                       BNE     1$              ;BR IF NO
2652  012254  005037  001472               CLR     KMNUM           ;SET OCTAL NUMBER OF KMC11'S TO 0
2653  012260  012702  002100               MOV     #KM.MAP,R2      ;R2 POINTS TO KMC MAP
2654  012264  005037  001470               CLR     KMACTV          ;CLEAR ACTIVE
2655  012270  032737  000001  001446       BIT     #SW00,STRTSW    ;QUESTIONS?
2656  012276  001002                       BNE     .+6             ;BR IF YES
2657  012300  000137  012740               JMP     7$              ;IF NO SKIP QUESTIONS
2658  012304  012737  000001  001306       MOV     #1,$TMP4        ;START WITH 1
2659  012312  104415                       INPUT
2660  012314  010324                       NUM
2661  012316  000001                       1
```

```
 2662  012320  000020                          16.
 2663  012322  C01302                          $TMP2
 2664  012324     000                          .BYTE   0
 2665  012325     001                          .BYTE   1
 2666  012326  013737  001302  001472          MOV     $TMP2,KMNUM     ;KMNUM = HOW MANY
 2667  012334  104401  001313          12$:    TYPE    ,$CRLF
 2668  012340  104416                          CONVRT                  ;TYPE WHICH KMC IS BEING DONE
 2669  012342  013372                          WHICH                   ;$TMP4 IS WHICH KMC
 2670  012344  005237  001306                  INC     $TMP4
 2671  012350  104415                          INPUT
 2672  012352  010364                          CSR
 2673  012354  160000                          160000
 2674  012356  164000                          164000
 2675  012360  001304                          $TMP3
 2676  012362     000                          .BYTE   0
 2677  012363     001                          .BYTE   1
 2678  012364  013722  001304                  MOV     $TMP3,(R2)+     ;STORE CSR IN MAP
 2679  012370  104415                          INPUT
 2680  012372  010402                          VEC
 2681  012374  000000                          0
 2682  012376  000776                          776
 2683  012400  001304                          $TMP3
 2684  012402     000                          .BYTE   0
 2685  012403     001                          .BYTE   1
 2686  012404  013712  001304                  MOV     $TMP3,(R2)      ;STORE VECTOR IN MAP
 2687  012410  104401                  10$:    TYPE
 2688  012412  010423                          PRIO                    ;ASK WHAT BR LEVEL
 2689  012414  004737  013664                  JSR     PC,INTTY        ;GET RESPONSE
 2690  012420  022703  000024                  CMP     #24,R3          ;
 2691  012424  101014                          BHI     50$             ;BR IF LESS THAN 4
 2692  012426  022703  000027                  CMP     #27,R3          ;
 2693  012432  103411                          BLO     50$             ;BR IF GREATER THAN 7
 2694  012434  012704  000011                  MOV     #11,R4          ;R4 = NUMBER OF SHIFTS
 2695  012440  006303                          ASL     R3              ;SHIFT R3 LEFT
 2696  012442  005304                          DEC     R4              ;DEC SHIFT COUNT
 2697  012444  001375                          BNE     .-4             ;BR IF NOT DONE
 2698  012446  042703  170777                  BIC     #170777,R3      ;BIC UNWANTED BITS
 2699  012452  050312                          BIS     R3,(R2)         ;PUT BR LEVEL IN STATUS MAP
 2700  012454  000403                          BR      8$              ;CONTINUE
 2701  012456  104401                  50$:    TYPE
 2702  012460  001312                          $QUES                   ;RESPONSE IS OUT OF LIMITS
 2703  012462  000752                          BR      10$             ;TRY AGAIN
 2704  012464                          8$:
 2705  012464                          9$:
 2706  012464                          16$:
 2707
 2708  012464  104401                          TYPE
 2709  012466  010462                          MODU                    ;ASK WHICH LINE UNIT
 2710  012470  004737  013664                  JSR     PC,INTTY        ;GET REPLY
 2711  012474  022703  000021                  CMP     #21,R3          ;"1"
 2712  012500  001417                          BEQ     30$
 2713  012502  022703  000022                  CMP     #22,R3          ;"2"
 2714  012506  001412                          BEQ     31$
 2715  012510  022703  000116                  CMP     #116,R3         ;"N"
 2716  012514  001403                          BEQ     32$
 2717  012516  104401                          TYPE
```

```
2718  012520  001312                          $QUES                   ;IF NOT A 1,2 OR N TYPE ''?''
2719  012522  000760                          BR      16$             ;TRY AGIAN
2720  012524  052722  010000          32$:    BIS     #BIT12,(R2)+    ;SET BIT 12 IN STAT2 IF NO LU
2721  012530  022222                          CMP     (R2)+,(R2)+     ;POP OVER STAT2 AND STAT3
2722  012532  000475                          BR      33$
2723  012534  052712  020000          31$:    BIS     #BIT13,(R2)     ;SET BIT 13 IN STAT2 IF M8202
2724  012540  104401                  30$:    TYPE
2725  012542  011017                          CONN                    ;ASK IF LOOP-BACK IS ON
2726  012544  004737  013664                  JSR     PC,INTTY        ;GET REPLY
2727  012550  022703  000131                  CMP     #131,R3         ;Y
2728  012554  001406                          BEQ     17$
2729  012556  022703  000116                  CMP     #116,R3         ;N
2730  012562  001436                          BEQ     18$
2731  012564  104401                          TYPE
2732  012566  001312                          $QUES                   ;IF NOT Y OR N TYPE ''?''
2733  012570  000763                          BR      30$             ;TRY AGAIN
2734  012572  052722  040000          17$:    BIS     #BIT14,(R2)+    ;TURNAROUND IS CONNECTED
2735  012576  032762  020000  177776          BIT     #BIT13,-2(R2)   ; M8202?
2736  012604  001027                          BNE     19$
2737  012606                          440$:
2738
2739  012606  104401                          TYPE            ; ASK QUESTION
2740  012610  010574                          MV35            ; ABOUT MODEM TTYPE
2741  012612  004737  013664                  JSR     PC,INTTY        ; GET ANSWER.
2742  012616  122703  000104                  CMPB    #'D,R3          ; IS IT DMC11-DA?
2743  012622  001004                          BNE     442$            ; NO.
2744
2745  012624  042762  000004  000002          BIC     #BIT2,2(R2)     ; YES INDICATE IT IN STAT3
2746  012632  000411                          BR      441$
2747
2748  012634  122703  000106          442$:   CMPB    #'F,R3          ;IS IT A DMC11-FA (V.35)?
2749  012640  001403                          BEQ     443$            ; YES-TAKE CARE OF IT.
2750
2751  012642  104401                          TYPE                    ; NO ASK OPERATER WHATS GOING ON.
2752  012644  001312                          $QUES
2753  012646  000757                          BR      440$            ; REASK QUESTION
2754
2755  012650  052762  000004  000002  443$:   BIS     #BIT2,2(R2)     ; YES V.35, RECORD IN STAT3
2756
2757  012656                          441$:                           ; END DECISION POINT.
2758  012656  000402                          BR      19$
2759  012660  042722  040000          18$:    BIC     #BIT14,(R2)+    ;NO TURNAROUND
2760  012664                          19$:
2761  012664  104415                          INPUT
2762  012666  010721                          LINE
2763  012670  000000                          0
2764  012672  000377                          377
2765  012674  001304                          $TMP3
2766  012676     000                          .BYTE   0
2767  012677     001                          .BYTE   1
2768  012700  113722  001304                  MOVB    $TMP3,(R2)+     ;STORE SWITCH PAC IN MAP
2769  012704  104415                          INPUT
2770  012706  010757                          BM
2771  012710  000000                          0
2772  012712  000377                          377
2773  012714  001304                          $TMP3
```

```
2774  012716  000                          .BYTE   0
2775  012717  001                          .BYTE   1
2776  012720  113722  001304               MOVB    $TMP3,(R2)+     ;STORE SWITCH PAC IN MAP
2777  012724  005722                       TST     (R2)+           ;POP OVER STAT3
2778  012726  005337  001302       33$:    DEC     $TMP2           ;DEC KMC COUNT
2779  012732  001200                       BNE     12$             ;BR IF MORE TO DO
2780  012734  000137  013272               JMP     13$             ;CONTINUE
2781  012740  012701  160000       7$:     MOV     #160000,R1      ;SET FOR FIRST ADDRESS TO BE TESTED
2782  012744  012737  013364  000004       MOV     #6$,@#4         ;SET FOR NON-EXISTANT DEVICE TIME OUT
2783  012752  005011               2$:     CLR     (R1)            ;CLEAR SEL0
2784  012754  005711                       TST     (R1)            ;IF KMC11 KMCSR S/B 0
2785  012756  001135                       BNE     3$              ;IF NO DEV ; TRAP TO 4. IF NO BIT 8 THEN NO KMC11
2786  012760  005061  000006               CLR     6(R1)           ;CLEAR SEL6
2787  012764  005761  000006               TST     6(R1)           ;IF KMC11 THEN KMRIC S/B =0!
2788  012770  001130                       BNE     3$              ;BR IF NOT KMC11
2789  012772  012711  002000               MOV     #BIT10,(R1)     ;SET ROMO
2790  012776  005061  000004               CLR     4(R1)           ;CLEAR SEL4
2791  013002  012761  125252  000006       MOV     #125252,6(R1)   ;WRITE THIS TO SEL6
2792  013010  052711  020000               BIS     #BIT13,(R1)     ;WRITE IT!
2793  013014  022761  125252  000004       CMP     #125252,4(R1)   ;WAS IT WRITTEN?
2794  013022  001113                       BNE     3$              ;IF NO IT IS NOT CRAM
2795                        ;AT THIS POINT IT IS ASSUMED THAT R1 HOLDS A KMC11 CSR ADDRESS.
2796  013024               21$:
2797  013024  010122       22$:    MOV     R1,(R2)+        ;STORE CSR IN CORE TABLE.
2798  013026  012711  001000       15$:    MOV     #BIT9,(R1)      ;CLEAR LINE UNIT LOOP
2799  013032  005061  000004               CLR     4(R1)           ;CLEAR PORT4
2800  013036  012761  122113  000006       MOV     #122113,6(R1)   ;LOAD INSTRUCTION (CLR DTR)
2801  013044  052711  000400               BIS     #BIT8,(R1)      ;CLOCK INSTRUCTION
2802  013050  012761  021264  000006       MOV     #021264,6(R1)   ;LOAD INSTRUCTION
2803  013056  052711  000400               BIS     #BIT8,(R1)      ;CLOCK INSTRUCTION
2804  013062  122761  000377  000004       CMPB    #377,4(R1)      ;IS IT ALL ONES?
2805  013070  001003                       BNE     .+10            ;BR IF NO
2806  013072  052712  010000               BIS     #BIT12,(R2)     ;IF YES, NO LINE UNIT, SET STATUS BIT
2807  013076  000436                       BR      20$
2808  013100  032761  000002  000004       BIT     #BIT1,4(R1)     ;IS SWITCH A ONE?
2809  013106  001403                       BEQ     .+10            ;BR IF M8201
2810  013110  052712  060000               BIS     #BIT13!BIT14,(R2) ;M8202 ASSUME CONNECTOR
2811  013114  000427                       BR      20$             ;CONNECTOR ON)
2812  013116  032761  000010  000004       BIT     #BIT3,4(R1)     ;IS MRDY SET
2813  013124  001023                       BNE     20$             ;BR IF M8201 NO CONNECTOR (ON LINE)
2814  013126  012761  000100  000004       MOV     #BIT6,4(R1)     ;LOAD PORT4
2815  013134  012761  122113  000006       MOV     #122113,6(R1)   ;LOAD INSTRUCTION
2816  013142  052711  000400               BIS     #BIT8,(R1)      ;CLOCK INSTRUCTION(SET DTR)
2817  013146  012761  021264  000006       MOV     #021264,6(R1)   ;LOAD INSTRUCTION
2818  013154  052711  000400               BIS     #BIT8,(R1)      ;CLOCK INSTRUCTION(READ MODEM REG)
2819  013160  032761  000010  000004       BIT     #BIT3,4(R1)     ;IS MRDY SET NOW?
2820  013166  001402                       BEQ     20$             ;BR IF NO CONNECTOR
2821  013170  052712  040000               BIS     #BIT14,(R2)     ;SET STATUS BIT FOR CONNECTOR
2822  013174  005722               20$:    TST     (R2)+           ;POP POINTER
2823  013176  012761  021324  000006       MOV     #021324,6(R1)   ;PUT INSTRUCTION IN PORT6
2824  013204  012711  001400               MOV     #BIT9!BIT8,(R1) ;PORT4_LU 15
2825  013210  156122  000004               BISB    4(R1),(R2)+     ;STORE DDCMP LINE # IN TABLE
2826  013214  012761  021344  000006       MOV     #021344,6(R1)   ;PORT6_INSTRUCTION
2827  013222  012711  001400               MOV     #BIT8!BIT9,(R1) ;CLOCK_INSTR.
2828  013226  156122  000004               BISB    4(R1),(R2)+     ;STORE BM873 ADD IN TABLE
2829  013232  005722                       TST     (R2)+           ;POP OVER STAT3
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 2830  013234  005011                          CLR     (R1)            ;CLEAR ROMI
 2831  013236  005237  001472                  INC     KMNUM           ;UPDATE DEVICE COUNTER
 2832  013242  022737  000020  001472          CMP     #20,KMNUM       ;ARE MAX. NO. OF DEV FOUND?
 2833  013250  001410                          BEQ     13$             ;YES DON'T LOOK FOR ANY MORE.
 2834  013252  005011                  3$:     CLR     (R1)            ;CLEAR BIT 10
 2835  013254  005061  000006                  CLR     6(R1)           ;CLEAR SEL 6
 2836  013260  062701  000010          14$:    ADD     #10,R1          ;UPDATE CSR POINTER ADDRESS
 2837  013264  022701  164000                  CMP     #164000,R1
 2838  013270  001230                          BNE     2$              ;BR IF MORE ADDRESS TO CHECK.
 2839  013272  005037  001470          13$:    CLR     KMACTV
 2840  013276  005737  001472                  TST     KMNUM           ;WERE ANY KMC11'S FOUND AT ALL?
 2841  013302  001423                          BEQ     5$              ;EPROR AUTO SIZER FOUND NO KMC11'S IN THIS SYS.
 2842  013304  013701  001472                  MOV     KMNUM,R1
 2843  013310  010137  001476                  MOV     R1,SAVNUM       ;SAVE NUMBER OF DEVICES
 2844  013314  000241                  4$:     CLC
 2845  013316  006137  001470                  ROL     KMACTV          ;GENERATE ACTIVE REGISTER OF DEVICES.
 2846  013322  005237  001470                  INC     KMACTV          ;SET THE BIT
 2847  013326  005301                          DEC     R1
 2848  013330  001371                          BNE     4$              ;BR IF MORE TO GENERATE
 2849  013332  012737  000006  000004          MOV     #6,@#4          ;RESTORE TRAP VECTOR
 2850  013340  013737  001470  001474          MOV     KMACTV,SAVACT   ;SAVE ACTIVE REGISTER
 2851  013346  000137  013400                  JMP     VECMAP          ;GO FIND THE VECTOR NOW.
 2852  013352  104401  007646          5$:     TYPE    ,MERR2          ;NOTIFY OPR THAT NO KMC11'S FOUND.
 2853  013356  005000                          CLR     R0              ;MAKE DATA LIGHTS ZERO
 2854  013360  000000                          HALT                    ;STOP THE SHOW
 2855  013362  000776                          BR      .-2             ;DISABLE CONT. SW.
 2856  013364  012716  013260          6$:     MOV     #14$,(SP)       ;ENTERED BY NON-EXISTANT TIME-OUT.
 2857  013370  000002                          RTI                     ;RETURN TO MAINSTREAM
 2858
 2859  013372  000001                  WHICH:  1
 2860  013374     002     002                  .BYTE   2,2
 2861  013376  001306                          $TMP4
 2862
 2863  013400  032737  000001  001446  VECMAP: BIT     #SW00,STRTSW
 2864  013406  001114                          BNE     5$
 2865  013410  012737  000340  000022          MOV     #340,@#22       ;SET IOT TRAP PRIO TO 7
 2866  013416  012737  013572  000020          MOV     #4$,@#20        ;SET IOT TRAP VECTOR
 2867  013424  012702  002100                  MOV     #KM.MAP,R2      ;SET SOFTWARE POINTER
 2868  013430  012700  000300                  MOV     #300,R0         ;FLOATING VECTORS START HERE.
 2869  013434  012701  000302                  MOV     #302,R1         ;PC OF IOT INSTR.
 2870  013440  010120                  1$:     MOV     R1,(R0)+        ;START FILLING VECTOR AREA
 2871  013442  012721  000004                  MOV     #4,(R1)+        ;WITH .+2; IOT
 2872  013446  022021                          CMP     (R0)+,(R1)+     ;ADD 2 TO R0 +R1
 2873  013450  020127  001000                  CMP     R1,#1000
 2874  013454  101771                          BLOS    1$              ;BR IF MORE TO FILL
 2875  013456  013737  001470  001276          MOV     KMACTV,$TMP0    ;STORE TEMPORALLY
 2876  013464  006037  001276          2$:     ROR     $TMP0           ;BRING OUT A BIT
 2877  013470  103063                          BCC     5$              ;BR IF ALL DONE
 2878  013472  012704  000012                  MOV     #12,R4          ;R4 IS INDEX REGISTER
 2879  013476  016437  013650  177776          MOV     BRLVL(R4),PS    ;SET PS TO 7
 2880  013504  011201                          MOV     (R2),R1
 2881  013506  012761  000200  000004          MOV     #200,4(R1)
 2882  013514  012711  001000                  MOV     #BIT9,(R1)      ;SET ROMI
 2883  013520  012761  121111  000006          MOV     #121111,6(R1)   ;PUT INSTRUCTION IN PORT6
 2884  013526  012711  001400                  MOV     #BIT9!BIT8,(R1) ;FORCE AN INTERRUPT
 2885  013532  105200                  7$:     INCB    R0              ;STALL
```

```
2886  013534  001376                          BNE     .-2             ;FOR TIME TO INTERUPT
2887  013536  162704  000002                  SUB     #2,R4           ;GET NEXT LOWEST PS LEVEL
2888  013542  001404                          BEQ     6$              ;BR IF R4 = 0
2889  013544  016437  013650  177776          MOV     BRLVL(R4),PS    ;MOVE NEXT LOWER LEVEL IN PS
2890  013552  000767                          BR      7$              ;BR TO DELAY
2891  013554  052762  005300  000002  6$:     BIS     #5300,2(R2)     ;NO INTERUPT ASSUME 300 AT LEVEL 5 AND FIX KMC11 LATER
2892  013562  005011                  3$:     CLR     (R1)            ;CLEAR ROMI
2893  013564  062702  000010                  ADD     #10,R2          ;POP SOFTWARE POINTER
2894  013570  000735                          BR      2$              ;KEEP GOING
2895  013572  051662  000002          4$:     BIS     (SP),2(R2)      ;GET VECTOR ADDRESS
2896  013576  042762  000007  000002          BIC     #7,2(R2)        ;CLEAR JUNK
2897  013604  016405  013652                  MOV     BRLVL+2(R4),R5  ;GET BR LEVEL OF KMC11
2898  013610  006305                          ASL     R5              ;SHIFT LEVEL 4 PLACES
2899  013612  006305                          ASL     R5              ;TO THE LEFT FOR THE
2900  013614  006305                          ASL     R5              ;STATUS TABLE
2901  013616  006305                          ASL     R5
2902  013620  042705  170777                  BIC     #170777,R5      ;CLEAR UNWANTED BITS
2903  013624  050562  000002                  BIS     R5,2(R2)        ;PUT BR LEVEL IN STATUS TABLE
2904  013630  022626                          CMP     (SP)+,(SP)+     ;POP IOT JUNK OFF STACK
2905  013632  012716  013562                  MOV     #3$,(SP)        ;SET FOR RETURN
2906  013636  000002                          RTI
2907  013640  012737  004134  000020  5$:     MOV     #$SCOPE,@#20    ; RESTORE SCOPE VECTOR
2908  013646  000207                          RTS     PC              ;ALL DONE WITH "AUTO SIZING"
2909
2910  013650  000000                  BRLVL:  PR0     ;LEVEL 0
2911  013652  000000                          PR0     ;LEVEL 0
2912  013654  000200                          PR4     ;LEVEL 4
2913  013656  000240                          PR5     ;LEVEL 5
2914  013660  000300                          PR6     ;LEVEL 6
2915  013662  000340                          PR7     ;LEVEL 7
2916
2917
2918  013664  105777  165354          INTTY:  TSTB    @$TKS           ;WAIT FOR DONE
2919  013670  100375                          BPL     .-4
2920  013672  017703  165350                  MOV     @$TKB,R3        ;PUT CHAR IN R3
2921  013676  105777  165346                  TSTB    @$TPS           ;WAIT UNTIL PRINTER IS READY
2922  013702  100375                          BPL     .-4
2923  013704  010377  165342                  MOV     R3,@$TPB        ;ECHO CHAR
2924  013710  042703  000240                  BIC     #BIT7!BIT5,R3   ;MASK OFF LOWER CASE
2925  013714  000207                          RTS     PC              ;RETURN
2926
2927  013716                          APT.SIZE:
2928  013716  000005                          RESET
2929  013720  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
2930  013722  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
2931  013724  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
2932  013726  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
2933  013730  005037  014132                  CLR     VECTR           ; CLEAR THE LOCAL VARIABLE
2934  013734  005037  014136                  CLR     PRIRTY          ; CLEAN UP LOCAL VARIABLE
2935  013740  013700  001376                  MOV     $CDW1,R0        ; GET THE DEVICE COUNT
2936  013744  010037  001476                  MOV     R0,SAVNUM       ; SAVE THE NO. OF DEVICES
2937  013750  012701  001346                  MOV     #$MAMS1,R1      ; GET EXTRA INFO, BITS POINTER
2938  013754  013737  001372  014134          MOV     $BASE,BASE      ; GET BASE CSR ADDRESS
2939  013762  113737  001366  014132          MOVB    $VECT1,VECTR    ; GET THE VECTOR
2940  013770  113737  001367  014136          MOVB    $VECT1+1,PRIRTY ; GET THE PRIORITY
2941  013776  013737  001374  001470          MOV     $DEVM,KMACTV    ; SAVE THE KMC'S SELECTED ACTIVE
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2942  014004  013737  001470  001474          MOV     KMACTV,SAVACT   ; SAVE THE ACTIVE REGISTER
2943  014012  012702  001402                  MOV     #$DDWO,R2       ; GET ADDRESS OF FIRST DEVICE DESCRIPTOR WORD
2944  014016  012703  002100                  MOV     #KM.MAP,R3      ; GET POINTER TO DEVICE MAP
2945  014022  005023                  3$:     CLR     (R3)+           ; CLEAR DEVICE MAP
2946  014024  022703  002300                  CMP     #KM.END,R3      ; IS WHOLE DEV.MAP CLEARED?
2947  014030  003374                          BGT     3$              ; NO, THEN GO ON.
2948  014032  012703  002100                  MOV     #KM.MAP,R3      ; RESTORE DEV.MAP POINTER.
2949  014036  013723  014134          1$:     MOV     BASE,(R3)+      ; LOAD CSR ADDRESS
2950  014042  112163  000001                  MOVB    (R1)+,1(R3)     ; GET EXTRA INFO. BITS
2951  014046  006213                          ASR     (R3)            ; SET IT IN RIGHT POSITION.
2952  014050  006213                          ASR     (R3)            ; SET IT IN RIGHT POSITION.
2953  014052  053713  014136                  BIS     PRIRTY,(R3)     ; GET PRIORITY IN STAT1
2954  014056  006313                          ASL     (R3)            ; SET THEM IN RIGHT POSITION
2955  014060  006313                          ASL     (R3)            ;  ''   ''   ''   ''   ''
2956  014062  006313                          ASL     (R3)            ;  ''   ''   ''   ''   ''
2957  014064  006313                          ASL     (R3)            ;  ''   ''   ''   ''   ''
2958  014066  053723  014132                  BIS     VECTR,(R3)+     ; GET THE VECTOR IN STAT1.
2959  014072  012223                          MOV     (R2)+,(R3)+     ; GET THE STAT2 FROM DDWXX
2960  014074  005723                          TST     (R3)+           ; SKIP OVER STAT3
2961  014076  005300                          DEC     R0              ; COUNT BY 1
2962  014100  001407                          BEQ     2$              ; ALL DONE?
2963  014102  062737  000010  014134          ADD     #10,BASE        ; INCREMENT BASE CSR ADDRESS BY 10
2964  014110  062737  000010  014132          ADD     #10,VECTR       ; INCREMENT VECTOR ADDRESS BY 10
2965  014116  000747                          BR      1$              ; SET THE NEXT MAP ENTRY
2966  014120                          2$:
2967  014120  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
2968  014122  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
2969  014124  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
2970  014126  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
2971  014130  000207                          RTS     PC              ; RETURN
2972  014132  000000                  VECTR:  .WORD   0
2973  014134  000000                  BASE:   .WORD   0
2974  014136  000000                  PRIRTY: .WORD   0
2975
2976
2977
2978                                          ;***************************** TEST 1 ****************************
2979                                          ;*OUT CONTROL REGISTER READ/ONLY TEST
2980                                          ;*DO A MASTER CLEAR, VERIFY THAT ALL READ/ONLY
2981                                          ;*BITS ARE IN THE CORRECT STATE
2982                                          ;;*********************************************************************
2983
2984                                          ;  TEST 1
2985                                          ;-------------
2986                                  ;;*********************************************************************
2987  014140  000004                  TST1:   SCOPE
2988  014142  012737  000001  001202          MOV     #1,$TSTNM               ; LOAD THE NO. OF THIS TEST
2989  014150  012737  014214  001442          MOV     #TST2,NEXT              ; POINT TO THE START OF NEXT TEST.
2990                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
2991  014156  005077  165704                  CLR     @KMCSR          ;CLEAR SEL0
2992  014162  012702  000011                  MOV     #11,R2          ;SAVE R2 FOR TYPEOUT
2993  014166  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
2994  014170  021224                          021004!<20*11>          ;PORT4 LINE UNIT REG 11
2995  014172  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
2996  014176  042704  000054                  BIC     #54,R4          ;CLEAR UNKNOWN BITS
2997  014202  012705  000020                  MOV     #20,R5          ;PUT "EXPECTED" IN R5
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2998  014206  120504                          CMPB    R5,R4           ;IS OUT READY SET?
2999  014210  001401                          BEQ     1$              ;BR IF YES
3000  014212  104002                          ERROR   2               ;ERROR IN LU 11
3001  014214                          1$:
3002
3003
3004                                          ;***************************** TEST 2 ****************************
3005                                          ;*IN CONTROL REGISTER READ/ONLY TEST
3006                                          ;*DO A MASTER CLEAR, VERIFY THAT ALL READ/ONLY
3007                                          ;*BITS ARE IN THE CORRECT STATE
3008                                          ;;*********************************************************************
3009
3010                                          ;  TEST 2
3011                                          ;-------------
3012                                  ;;*********************************************************************
3013  014214  000004                  TST2:   SCOPE
3014  014216  012737  000002  001202          MOV     #2,$TSTNM               ; LOAD THE NO. OF THIS TEST
3015  014224  012737  014262  001442          MOV     #TST3,NEXT              ; POINT TO THE START OF NEXT TEST.
3016                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
3017  014232  012702  000012                  MOV     #12,R2          ;SAVE R2 FOR TYPEOUT
3018  014236  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3019  014240  021244                          021004!<20*12>          ;PORT4 LINE UNIT REG 12
3020  014242  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
3021  014246  042704  000017                  BIC     #17,R4          ;CLEAR UNKNOWN BITS
3022  014252  005005                          CLR     R5              ;PUT "EXPECTED" IN R5
3023  014254  120504                          CMPB    R5,R4           ;ARE ALL BITS CLEARED?
3024  014256  001401                          BEQ     1$              ;BR IF YES
3025  014260  104002                          ERROR   2               ;ERROR IN LU 12
3026  014262                          1$:
3027
3028
3029                                          ;***************************** TEST 3 ****************************
3030                                          ;*MODEM CONTROL REGISTER READ/ONLY TEST
3031                                          ;*DO A MASTER CLEAR, VERIFY THAT ALL READ/ONLY
3032                                          ;*BITS ARE IN THE CORRECT STATE
3033                                          ;;*********************************************************************
3034
3035                                          ;  TEST 3
3036                                          ;-------------
3037                                  ;;*********************************************************************
3038  014262  000004                  TST3:   SCOPE
3039  014264  012737  000003  001202          MOV     #3,$TSTNM               ; LOAD THE NO. OF THIS TEST
3040  014272  012737  014334  001442          MOV     #TST4,NEXT              ; POINT TO THE START OF NEXT TEST.
3041                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
3042  014300  104410                          MSTCLR                  ;MASTER CLEAR KMC11
3043  014302  012702  000013                  MOV     #13,R2          ;SAVE R2 FOR TYPEOUT
3044  014306  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3045  014310  021264                          021004!<20*13>          ;PORT4 LINE UNIT REG 13
3046  014312  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
3047  014316  042704  000213                  BIC     #213,R4         ;CLEAR UNKNOWN BITS
3048  014322  012705  000100                  MOV     #100,R5         ;PUT "EXPECTED" IN R5
3049  014326  120504                          CMPB    R5,R4           ;ARE RING, DTR,  AND MODEM READY SET?
3050  014330  001401                          BEQ     1$              ;BR IF YES
3051  014332  104002                          ERROR   2               ;ERROR IN LU 13
3052  014334                          1$:
3053
```

```
                                        ;***************************** TEST 4 *****************************
                                        ;*MAINTENANCE REGISTER READ/ONLY TEST
                                        ;*DO A MASTER CLEAR, VERIFY THAT ALL READ/ONLY
                                        ;*BITS ARE IN THE CORRECT STATE
                                        ;:***********************************************************************

                                        ;  TEST 4
                                        ;-------------
                                    ;;**********************************************************************
014334  000004                      TST4:   SCOPE
014336  012737  000004  001202              MOV     #4,$TSTNM               ; LOAD THE NO. OF THIS TEST
014344  012737  014426  001442              MOV     #TST5,NEXT              ; POINT TO THE START OF NEXT TEST.
                                                                    ;R1 CONTAINS BASE KMC11 ADDRESS
014352  104410                              MSTCLR                  ;MASTER CLEAR KMC11
014354  012702  000017                      MOV     #17,R2          ;SAVE R2 FOR TYPEOUT
014360  104412                              ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
014362  021364                              021004!<20*17>          ;PORT4 LINE UNIT REG 17
014364  016104  000004                      MOV     4(R1),R4        ;PUT "FOUND" IN R4
014370  042704  000206                      BIC     #206,R4         ;CLEAR UNKNOWN BITS
014374  012705  000051                      MOV     #51,R5          ;PUT "EXPECTED" IN R5
014400  032737  020000  002050              BIT     #BIT13,STAT1    ;IS LU AN M8202 OR M8201?
014406  001404                              BEQ     .+12            ;BR IF M8201
014410  042704  000040                      BIC     #40,R4          ;MASK OFF SI BIT IF M8202
014414  042705  000040                      BIC     #BIT5,R5        ;SI BIT IS UNKNOWN ON AN M8202
014420  120504                              CMPB    R5,R4           ;ARE SI AND ICIR SET?
014422  001401                              BEQ     1$              ;BR IF YES
014424  104002                              ERROR   2               ;ERROR IN LU 17
014426                                  1$:
                                        ;***************************** TEST 5 *****************************
                                        ;*LINE UNIT REGISTER WRITE/READ TEST
                                        ;*SET BIT5 IN LU REGISTER 12, VERIFY IT IS SET
                                        ;*CLEAR BIT5 IN LU REGISTER 12, VERIFY IT IS CLEAR
                                        ;:***********************************************************************

                                        ;  TEST 5
                                        ;-------------
                                    ;;**********************************************************************
014426  000004                      TST5:   SCOPE
014430  012737  000005  001202              MOV     #5,$TSTNM               ; LOAD THE NO. OF THIS TEST
014436  012737  014566  001442              MOV     #TST6,NEXT              ; POINT TO THE START OF NEXT TEST.
014444  012737  014460  001444              MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
                                                                    ;R1 CONTAINS BASE KMC11 ADDRESS
014452  104410                              MSTCLR                  ;MASTER CLEAR KMC11
014454  012702  000012                      MOV     #12,R2          ;SAVE REGISTER ADDRESS FOR TYPEOUT
014460  012761  000040  000004  1$:         MOV     #40,4(R1)       ;LOAD PORT4
014466  104412                              ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
014470  122112                              122112                  ;SET BIT5 IN LU-12
014472  104412                              ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
014474  021245                              021245                  ;READ LU-12
014476  012705  000040                      MOV     #40,R5          ;PUT "EXPECTED" IN R5
014502  116104  000005                      MOVB    5(R1),R4        ;PUT "FOUND" IN R4
014506  042704  000337                      BIC     #337,R4         ;CLEAR UNWANTED BITS
014512  120504                              CMPB    R5,R4           ;IS BIT5 SET?
```

```
3110  014514  001401                          BEQ     2$              ;BR IF YES
3111  014516  104003                          ERROR   3               ;ERROR, BIT 5 IS NOT SET
3112  014520  104405                  2$:     SCOP1                   ;SCOPE SUBTEST (SW09=1)
3113  014522  012737  014530  001444          MOV     #3$,LOCK        ;NEW SCOP1
3114  014530  005061  000004          3$:     CLR     4(R1)           ;LOAD PORT4
3115  014534  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3116  014536  122112                          122112                  ;CLEAR BIT 5 IN LU-12
3117  014540  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3118  014542  021245                          021245                  ;READ LU-12
3119  014544  005005                          CLR     R5              ;PUT "EXPECTED" IN R5
3120  014546  116104  000005                  MOVB    5(R1),R4        ;PUT "FOUND" IN R4
3121  014552  042704  000337                  BIC     #337,R4         ;CLEAR UNWANTED BITS
3122  014556  120504                          CMPB    R5,R4           ;IS BIT5 CLEAR?
3123  014560  001401                          BEQ     4$              ;BR IF YES
3124  014562  104003                          ERROR   3               ;ERROR, BIT5 IS NOT CLEAR
3125  014564  104405                  4$:     SCOP1                   ;SCOPE SUBTEST (SW09=1)
3126
3127
3128                                          ;***************************** TEST 6 ****************************
3129                                          ;*LINE UNIT REGISTER WRITE/READ TEST
3130                                          ;*SET BIT1 IN LU REGISTER 17, VERIFY IT IS SET
3131                                          ;*CLEAR BIT1 IN LU REGISTER 17, VERIFY IT IS CLEAR
3132                                          ;;**********************************************************************
3133
3134                                          ;  TEST 6
3135                                          ;-------------
3136                                  ;;**********************************************************************
3137  014566  000004                  TST6:   SCOPE
3138  014570  012737  000006  001202          MOV     #6,$TSTNM               ; LOAD THE NO. OF THIS TEST
3139  014576  012737  014726  001442          MOV     #TST7,NEXT              ; POINT TO THE START OF NEXT TEST.
3140  014604  012737  014620  001444          MOV     #1$,LOCK                ; ADDRESS FOR LOCK ON DATA.
3141                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
3142  014612  104410                          MSTCLR                  ;MASTER CLEAR KMC11
3143  014614  012702  000017                  MOV     #17,R2          ;SAVE REGISTER ADDRESS FOR TYPEOUT
3144  014620  012761  000001  000004  1$:     MOV     #1,4(R1)        ;LOAD PORT4
3145  014626  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3146  014630  122117                          122117                  ;SET BIT1 IN LU-17
3147  014632  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3148  014634  021365                          021365                  ;READ LU-17
3149  014636  012705  000001                  MOV     #1,R5           ;PUT "EXPECTED" IN R5
3150  014642  116104  000005                  MOVB    5(R1),R4        ;PUT "FOUND" IN R4
3151  014646  042704  000376                  BIC     #376,R4         ;CLEAR UNWANTED BITS
3152  014652  120504                          CMPB    R5,R4           ;IS BIT1 SET?
3153  014654  001401                          BEQ     2$              ;BR IF YES
3154  014656  104003                          ERROR   3               ;ERROR, BIT 1 IS NOT SET
3155  014660  104405                  2$:     SCOP1                   ;SCOPE SUBTEST (SW09=1)
3156  014662  012737  014670  001444          MOV     #3$,LOCK        ;NEW SCOP1
3157  014670  005061  000004          3$:     CLR     4(R1)           ;LOAD PORT4
3158  014674  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3159  014676  122117                          122117                  ;CLEAR BIT 1 IN LU-17
3160  014700  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3161  014702  021365                          021365                  ;READ LU-17
3162  014704  005005                          CLR     R5              ;PUT "EXPECTED" IN R5
3163  014706  116104  000005                  MOVB    5(R1),R4        ;PUT "FOUND" IN R4
3164  014712  042704  000376                  BIC     #376,R4         ;CLEAR UNWANTED BITS
3165  014716  120504                          CMPB    R5,R4           ;IS BIT1 CLEAR?
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3166  014720  001401                        BEQ     4$              ;BR IF YES
3167  014722  104003                        ERROR   3               ;ERROR, BIT1 IS NOT CLEAR
3168  014724  104405                4$:     SCOP1                   ;SCOPE SUBTEST (SW09=1)
3169
3170
3171                                        ;***************************** TEST 7 ****************************
3172                                        ;*LINE UNIT REGISTER WRITE/READ TEST
3173                                        ;*FLOAT A 1 THROUGH LINE UNIT REGISTER 13
3174                                        ;*FLOAT A 0 THROUGH LINE UNIT REGISTER 13
3175                                        ;;*********************************************************************
3176
3177                                        ;  TEST 7
3178                                        ;-------------
3179                                ;;*********************************************************************
3180  014726  000004                TST7:   SCOPE
3181  014730  012737  000007  001202        MOV     #7,$TSTNM               ; LOAD THE NO. OF THIS TEST
3182  014736  012737  015136  001442        MOV     #TST10,NEXT             ; POINT TO THE START OF NEXT TEST.
3183  014744  012737  014764  001444        MOV     #64$,LOCK               ; ADDRESS FOR LOCK ON DATA.
3184                                                                ;R1 CONTAINS BASE KMC11 ADDRESS
3185  014752  104410                        MSTCLR                  ;MASTER CLEAR KMC11
3186  014754  012702  000013                MOV     #13,R2          ;SAVE REGISTER ADDRESS FOR TYPEOUT
3187  014760  012700  000001                MOV     #1,R0           ;START WITH BIT 0
3188  014764                        64$:
3189  014764  010061  000004                MOV     R0,4(R1)        ;PUT PATTERN INTO PORT4
3190  014770  042761  000257  000004        BIC     #257,4(R1)      ;CLEAR UNWANTED BITS
3191  014776  104412                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3192  015000  122113                        122100!13               ;MOV DATA TO IBUS REGISTER 13
3193  015002  104412                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3194  015004  021265                        21005!<13*20>           ;READ FROM IBUS REGISTER 13
3195  015006  010005                        MOV     R0,R5           ;PUT EXPECTED IN R5
3196  015010  042705  000257                BIC     #257,R5         ;CLEAR UNWANTED BITS
3197  015014  116104  000005                MOVB    5(R1),R4        ;PUT "FOUND" INTO R4
3198  015020  042704  000257                BIC     #257,R4         ;CLEAR UNWANTED BITS
3199  015024  120504                        CMPB    R5,R4           ;DATA CORRECT?
3200  015026  001401                        BEQ     65$             ;BR IF YES
3201  015030  104003                        ERROR   3               ;ERROR
3202  015032  104405                65$:    SCOP1                   ;SW09=1?
3203  015034  000241                        CLC                     ;CLEAR CARRY
3204  015036  106100                        ROLB    R0              ;SHIFT BIT IN R0
3205  015040  001351                        BNE     64$             ;IF R0=0 THEN DONE
3206  015042  012737  015056  001444        MOV     #67$,LOCK       ;NEW SCOP1
3207  015050  012700  000001                MOV     #1,R0           ;START WITH BIT 0
3208  015054  005100                69$:    COM     R0              ;CHANGE TO FLOATING ZERO
3209  015056                        67$:
3210  015056  010061  000004                MOV     R0,4(R1)        ;PUT PATTERN INTO PORT4
3211  015062  042761  000257  000004        BIC     #257,4(R1)      ;CLEAR UNWANTED BITS
3212  015070  104412                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3213  015072  122113                        122100!13               ;MOV DATA TO IBUS REGISTER 13
3214  015074  104412                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3215  015076  021265                        21005!<13*20>           ;READ FROM IBUS REGISTER 13
3216  015100  010005                        MOV     R0,R5           ;PUT EXPECTED IN R5
3217  015102  042705  000257                BIC     #257,R5         ;CLEAR UNWANTED BITS
3218  015106  116104  000005                MOVB    5(R1),R4        ;PUT "FOUND" INTO R4
3219  015112  042704  000257                BIC     #257,R4         ;CLEAR UNWANTED BITS
3220  015116  120504                        CMPB    R5,R4           ;DATA CORRECT?
3221  015120  001401                        BEQ     68$             ;BR IF YES
```

```
3222  015122  104003                        ERROR   3               ;ERROR
3223  015124  104405              68$:      SCOP1                   ;SW09=1?
3224  015126  005100                        COM     R0              ;CHANGE TO FLOATING 1
3225  015130  000241                        CLC                     ;CLEAR CARRY
3226  015132  106100                        ROLB    R0              ;SHIFT BIT IN R0
3227  015134  001347                        BNE     69$             ;IF R0=0 THEN DONE
3228
3229
3230                                        ;************************** TEST 10 **************************
3231                                        ;*LINE UNIT REGISTER WRITE/READ TEST
3232                                        ;*FLOAT A 1 THROUGH LINE UNIT REGISTER 14
3233                                        ;*FLOAT A 0 THROUGH LINE UNIT REGISTER 14
3234                                        ;;*************************************************************
3235
3236                                        ;  TEST 10
3237                                        ;-------------
3238                                    ;;**************************************************************
3239  015136  000004              TST10:    SCOPE
3240  015140  012737  000010  001202        MOV     #10,$TSTNM              ; LOAD THE NO. OF THIS TEST
3241  015146  012737  015312  001442        MOV     #TST11,NEXT             ; POINT TO THE START OF NEXT TEST.
3242  015154  012737  015174  001444        MOV     #64$,LOCK               ; ADDRESS FOR LOCK ON DATA.
3243                                                                ;R1 CONTAINS BASE KMC11 ADDRESS
3244  015162  104410                        MSTCLR                  ;MASTER CLEAR KMC11
3245  015164  012702  000014                MOV     #14,R2          ;SAVE REGISTER ADDRESS FOR TYPEOUT
3246  015170  012700  000001                MOV     #1,R0           ;START WITH BIT 0
3247  015174                        64$:
3248  015174  010061  000004                MOV     R0,4(R1)        ;PUT PATTERN INTO PORT4
3249  015200  104412                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3250  015202  122114                        122100!14               ;MOV DATA TO IBUS REGISTER 14
3251  015204  104412                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3252  015206  021305                        21005!<14*20>           ;READ FROM IBUS REGISTER 14
3253  015210  010005                        MOV     R0,R5           ;PUT EXPECTED IN R5
3254  015212  116104  000005                MOVB    5(R1),R4        ;PUT "FOUND" INTO R4
3255  015216  120504                        CMPB    R5,R4           ;DATA CORRECT?
3256  015220  001401                        BEQ     65$             ;BR IF YES
3257  015222  104003                        ERROR   3               ;ERROR
3258  015224  104405              65$:      SCOP1                   ;SW09=1?
3259  015226  000241                        CLC                     ;CLEAR CARRY
3260  015230  106100                        ROLB    R0              ;SHIFT BIT IN R0
3261  015232  001360                        BNE     64$             ;IF R0=0 THEN DONE
3262  015234  012737  015250  001444        MOV     #67$,LOCK       ;NEW SCOP1
3263  015242  012700  000001                MOV     #1,R0           ;START WITH BIT 0
3264  015246  005100              69$:      COM     R0              ;CHANGE TO FLOATING ZERO
3265  015250                      67$:
3266  015250  010061  000004                MOV     R0,4(R1)        ;PUT PATTERN INTO PORT4
3267  015254  104412                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3268  015256  122114                        122100!14               ;MOV DATA TO IBUS REGISTER 14
3269  015260  104412                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3270  015262  021305                        21005!<14*20>           ;READ FROM IBUS REGISTER 14
3271  015264  010005                        MOV     R0,R5           ;PUT EXPECTED IN R5
3272  015266  116104  000005                MOVB    5(R1),R4        ;PUT "FOUND" INTO R4
3273  015272  120504                        CMPB    R5,R4           ;DATA CORRECT?
3274  015274  001401                        BEQ     68$             ;BR IF YES
3275  015276  104003                        ERROR   3               ;ERROR
3276  015300  104405              68$:      SCOP1                   ;SW09=1?
3277  015302  005100                        COM     R0              ;CHANGE TO FLOATING 1
```

```
3278  015304  000241                          CLC                     ;CLEAR CARRY
3279  015306  106100                          ROLB    R0              ;SHIFT BIT IN R0
3280  015310  001356                          BNE     69$             ;IF R0=0 THEN DONE
3281
3282
3283                                          ;***************************** TEST 11 ****************************
3284                                          ;*SWITCH PAC TEST
3285                                          ;*THIS TEST READS SWITCH PAC#1
3286                                          ;*THIS SWITCH PAC CONTAINS THE DDCMP LINE #
3287                                          ;:*************************************************************
3288
3289                                          ;  TEST 11
3290                                          ;-------------
3291                                    ;;*************************************************************
3292  015312  000004                    TST11:  SCOPE
3293  015314  012737  000011  001202           MOV     #11,$TSTNM              ; LOAD THE NO. OF THIS TEST
3294  015322  012737  015354  001442           MOV     #TST12,NEXT             ; POINT TO THE START OF NEXT TEST.
3295                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
3296  015330  104410                          MSTCLR                  ;MASTER CLEAR KMC11
3297  015332  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3298  015334  021324                          021324                  ;PORT4 LU15
3299  015336  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
3300  015342  113705  002052                  MOVB    STAT2,R5        ;PUT "EXPECTED" IN R5
3301  015346  120504                          CMPB    R5,R4           ;SW OK?
3302  015350  001401                          BEQ     1$              ;BR IF YES
3303  015352  104031                          ERROR   31              ;ERROR, SWITCH PAC READ ERROR
3304  015354                            1$:
3305
3306
3307                                          ;***************************** TEST 12 ****************************
3308                                          ;*SWITCH PAC TEST
3309                                          ;*THIS TEST READS SWITCH PAC#2
3310                                          ;*THIS SWITCH PAC CONTAINS THE BM873 BOOT ADD
3311                                          ;:*************************************************************
3312
3313                                          ;  TEST 12
3314                                          ;-------------
3315                                    ;;*************************************************************
3316  015354  000004                    TST12:  SCOPE
3317  015356  012737  000012  001202           MOV     #12,$TSTNM              ; LOAD THE NO. OF THIS TEST
3318  015364  012737  015416  001442           MOV     #TST13,NEXT             ; POINT TO THE START OF NEXT TEST.
3319                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
3320  015372  104410                          MSTCLR                  ;MASTER CLEAR KMC11
3321  015374  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3322  015376  021344                          021344                  ;PORT4 LU16
3323  015400  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
3324  015404  113705  002053                  MOVB    STAT2+1,R5      ;PUT "EXPECTED" IN R5
3325  015410  120504                          CMPB    R5,R4           ;SW OK?
3326  015412  001401                          BEQ     1$              ;BR IF YES
3327  015414  104031                          ERROR   31              ;ERROR, SWITCH PAC READ ERROR
3328  015416                            1$:
3329
3330
3331                                          ;***************************** TEST 13 ****************************
3332                                          ;*LINE UNIT CLOCK TEST
3333                                          ;*THIS TEST VERIFYS THAT THE LU INTERNAL CLOCK
```

```
3334                                        ;*(BIT 1 IN LU-17) IS WORKING
3335                                        ;;*****************************************************************
3336
3337                                        ;  TEST 13
3338                                        ;-------------
3339                                    ;;*****************************************************************
3340  015416  000004                TST13:  SCOPE
3341  015420  012737  000013  001202        MOV     #13,$TSTNM              ; LOAD THE NO. OF THIS TEST
3342  015426  012737  015516  001442        MOV     #TST14,NEXT             ; POINT TO THE START OF NEXT TEST.
3343                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
3344  015434  104410                       MSTCLR                  ;MASTER CLEAR KMC11
3345  015436  005037  011234               CLR     TEMP            ;PREPARE FOR DELAY
3346  015442                        1$.
3347  015442  104412                       ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3348  015444  021364                       021364                  ;PORT4 LU-17
3349  015446  032761  000002  000004       BIT     #2,4(R1)        ;IS CLOCK BIT SET?
3350  015454  001004                       BNE     2$              ;BR IF YES
3351  015456  005237  011234               INC     TEMP            ;DELAY
3352  015462  001367                       BNE     1$      ;DELAY FINISHED?
3353  015464  104004                       ERROR   4               ;ERROR BIT IS STUCK CLEAR
3354  015466  005037  011234        2$:    CLR     TEMP            ;PREPARE FOR DELAY
3355  015472                        3$:
3356  015472  104412                       ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3357  015474  021364                       021364                  ;PORT4 LU-17
3358  015476  032761  000002  000004       BIT     #2,4(R1)        ;IS CLOCK BIT CLEAR?
3359  015504  001404                       BEQ     4$              ;BR IF YES
3360  015506  005237  011234               INC     TEMP            ;DELAY
3361  015512  001367                       BNE     3$              ;BR IF DELAY NOT DONE
3362  015514  104004                       ERROR   4               ;ERROR BIT IS STUCK SET
3363  015516                        4$:
3364
3365
3366                                        ;***************************** TEST 14 ****************************
3367                                        ;*OUT DATA SILO TEST
3368                                        ;*SET SOM AND LOAD OUT DATA SILO
3369                                        ;*VERIFY THAT OCOR SET, INDICATING THAT THE
3370                                        ;*CHARACTER IS AT THE BOTTOM OF THE OUT SILO
3371                                        ;;*****************************************************************
3372
3373                                        ;  TEST 14
3374                                        ;-------------
3375                                    ;;*****************************************************************
3376  015516  000004                TST14:  SCOPE
3377  015520  012737  000014  001202        MOV     #14,$TSTNM              ; LOAD THE NO. OF THIS TEST
3378  015526  012737  015616  001442        MOV     #TST15,NEXT             ; POINT TO THE START OF NEXT TEST.
3379                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
3380  015534  104410                       MSTCLR                  ;MASTER CLEAR KMC11
3381  015536  012711  004000               MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
3382  015542  012761  000001  000004       MOV     #1,4(R1)        ;LOAD PORT4 WITH BIT0
3383  015550  104412                       ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3384  015552  122111                       122111                  ;SET SOM
3385  015554  104412                       ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3386  015556  122110                       122110                  ;LOAD OUT DATA SILO
3387  015560  104414  000002               TIMER,  2               ;WAIT FOR OCOR
3388  015564  012702  000017               MOV     #17,R2          ;SAVE ADDRESS FOR TYPEOUT
3389  015570  104412                       ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
```

```
                                                021364                  ;PORT4 LU 17
                                                MOV     4(R1),R4        ;PUT "FOUND" IN R4
                                                BIC     #357,R4         ;CLEAR UNWANTED BITS
                                                MOV     #20,R5          ;PUT "EXPECTED" IN R5
                                                CMPB    R5,R4           ;IS OCOR SET?
                                                BEQ     1$              ;BR IF YES
                                                ERROR   5
                                        1$:
                                                ;***************************** TEST 15 ***************************
                                                ;*DDCMP TEST OF RTS AND OUT ACTIVE
                                                ;*SET SOM AND LOAD OUT DATA SILO
                                                ;*SINGLE STEP 2 DATA CLOCKS, VERIFY
                                                ;*THAT RTS AND ACTIVE ARE SET
                                                ;;*********************************************************************
                                                ;  TEST 15
                                                ;-------------
                                        ;;*********************************************************************
 015616  000004                         TST15:  SCOPE
 015620  012737  000015  001202                 MOV     #15,$TSTNM              ; LOAD THE NO. OF THIS TEST
 015626  012737  015754  001442                 MOV     #TST16,NEXT             ; POINT TO THE START OF NEXT TEST.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
 015634  104410                                 MSTCLR                  ;MASTER CLEAR KMC11
 015636  012711  004000                         MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
 015642  012761  000001  000004                 MOV     #1,4(R1)        ;LOAD PORT4 WITH BIT0
 015650  104412                                 ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 015652  122111                                 122111                  ;SET SOM
 015654  104412                                 ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 015656  122110                                 122110                  ;LOAD OUT DATA SILO
 015660  004737  030260                         JSR     PC,OCOR         ;WAIT FOR OCOR
 015664  104413  000002                         DATACLK,        2       ;CLOCK DATA FOUR TIMES
 015670  012702  000011                         MOV     #11,R2          ;SAVE ADDRESS FOR TYPEOUT
 015674  104412                                 ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 015676  021224                                 021224                  ;PORT4 LU 11
 015700  016104  000004                         MOV     4(R1),R4        ;PUT "FOUND" IN R4
 015704  042704  000257                         BIC     #257,R4         ;CLEAR UNWANTED BITS
 015710  012705  000120                         MOV     #120,R5         ;PUT "EXPECTED" IN R5
 015714  120504                                 CMPB    R5,R4           ;IS ACTIVE SET?
 015716  001401                                 BEQ     1$              ;BR IF YES
 015720  104005                                 ERROR   5
 015722                                 1$:
 015722  012702  000013                         MOV     #13,R2          ;SAVE ADDRESS FOR TYPEOUT
 015726  104412                                 ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 015730  021264                                 021264                  ;PORT4 LU 13
 015732  016104  000004                         MOV     4(R1),R4        ;PUT EXPECTED IN R4
 015736  042704  000337                         BIC     #337,R4         ;CLEAR UNWANTED BITS
 015742  012705  000040                         MOV     #BIT5,R5        ;PUT "EXPECTED" IN R5, RTS SHOULD BE SET
 015746  120504                                 CMPB    R5,R4           ;IS RTS OK?
 015750  001401                                 BEQ     2$              ;BR IF YES
 015752  104005                                 ERROR   5               ;RTS ERROR
 015754                                 2$:


                                                ;***************************** TEST 16 ***************************
```

```
                                        ;*TEST OF OUT CLEAR
                                        ;*SET SOM AND LOAD OUT DATA SILO
                                        ;*SINGLE STEP DATA CLOCK, SET OUT CLEAR
                                        ;*VERIFY THAT OCOR,RTS, AND ACTIVE ARE CLEARED
                                        ;;*****************************************************************

                                        ;  TEST 16
                                        ;-------------
                                        ;;*****************************************************************
015754  000004                  TST16:  SCOPE
015756  012737  000016  001202          MOV     #16,$TSTNM              ; LOAD THE NO. OF THIS TEST
015764  012737  016152  001442          MOV     #TST17,NEXT             ; POINT TO THE START OF NEXT TEST.
                                                                ;R1 CONTAINS BASE KMC11 ADDRESS
015772  104410                          MSTCLR                  ;MASTER CLEAR KMC11
015774  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
016000  012761  000001  000004          MOV     #1,4(R1)        ;LOAD PORT4 WITH BIT0
016006  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016010  122111                          122111                  ;SET SOM
016012  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016014  122110                          122110                  ;LOAD OUT DATA SILO
016016  004737  030260                  JSR     PC,OCOR         ;WAIT FOR OCOR
016022  104413  000002                  DATACLK,        2       ;CLOCK DATA FOUR TIMES
016026  012761  000200  000004          MOV     #BIT7,4(R1)     ;SET BIT7 IN PORT4
016034  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016036  122111                          122111                  ;SET OUT CLEAR
016040  104413  000001                  DATACLK,        1       ;GIVE A TICK TO CLEAR RTS
016044  012702  000017                  MOV     #17,R2          ;SAVE ADDRESS FOR TYPEOUT
016050  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016052  021364                          021364                  ;PORT4 LU 17
016054  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
016060  042704  000357                  BIC     #357,R4         ;CLEAR UNWANTED BITS
016064  005005                          CLR     R5              ;PUT "EXPECTED" IN R5
016066  120504                          CMPB    R5,R4           ;IS OCOR CLEARED?
016070  001401                          BEQ     1$              ;BR IF YES
016072  104005                          ERROR   5
016074                          1$:
016074  012702  000013                  MOV     #13,R2          ;SAVE ADDRESS FOR TYPEOUT
016100  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016102  021264                          021264                  ;PORT4 LU 13
016104  016104  000004                  MOV     4(R1),R4        ;PUT EXPECTED IN R4
016110  042704  000337                  BIC     #337,R4         ;CLEAR UNWANTED BITS
016114  005005                          CLR     R5              ;PUT "EXPECTED" IN R5, RTS SHOULD BE CLEARED
016116  120504                          CMPB    R5,R4           ;IS RTS OK?
016120  001401                          BEQ     2$              ;BR IF YES
016122  104005                          ERROR   5               ;RTS ERROR
016124                          2$:
016124  012702  000011                  MOV     #11,R2          ;SAVE ADDRESS FOR TYPEOUT
016130  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016132  021224                          021224                  ;PORT4 LU11
016134  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
016140  012705  000020                  MOV     #BIT4,R5        ;ONLY OUT READY SHOULD BE SET
016144  120504                          CMPB    R5,R4           ;IS ACTIVE CLEAR?
016146  001401                          BEQ     3$              ;BR IF YES
016150  104005                          ERROR   5               ;ERROR ACTIVE NOT CLEARED
016152                          3$:

```

```
                                        ;*************************** TEST 17 ***********************
                                        ;*DDCMP TRANSMITTER TEST
                                        ;*SINGLE CLOCK THE CHARACTER 0
                                        ;*VERIFY EACH BIT POSITION AS IT
                                        ;*PASSES THE BIT WINDOW (SI BIT)
                                        ;*ON AN ERROR, R3 CONTAINS BIT POSITION OF FAILURE
                                        ;*********************************************************

                                        ;  TEST 17
                                        ;-------------
                                    ;*********************************************************
016152  000004                  TST17:  SCOPE
016154  012737  000017  001202          MOV     #17,$TSTNM              ; LOAD THE NO. OF THIS TEST
016162  012737  016334  001442          MOV     #TST20,NEXT             ; POINT TO THE START OF NEXT TEST.
                                                                ;R1 CONTAINS BASE KMC11 ADDRESS
016170  104410                          MSTCLR                  ;MASTER CLEAR KMC11
016172  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
016176  004737  030412                  JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
016202  012761  000001  000004          MOV     #1,4(R1)        ;SET BIT0 IN PORT4
016210  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016212  122111                          122111                  ;SET SOM!
016214  012705  000000                  MOV     #0,R5   ;LOAD CHARACTER IN R5 FOR TYPEOUT
016220  004737  030412                  JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
016224  010561  000004                  MOV     R5,4(R1)        ;LOAD PORT4 WITH CHARACTER
016230  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC-5304
016232  122110                          122110                  ;LOAD OUT DATA
016234  004737  030260                  JSR     PC,OCOR         ;WAIT FOR OCOR TO SET
016240  005003                          CLR     R3              ;CLEAR BIT COUNTER
016242  010502                          MOV     R5,R2           ;LOAD CHARACTER IN R2
016244  104413  000002                  DATACLK,        2       ;2 TICKS TO SET UP TRANSMITTER
016250  104413  000001          1$:     DATACLK,        1       ;SHIFT NEXT BIT IN THE WINDOW (SI BIT)
016254  106002                          RORB    R2              ;SHIFT NEXT SOFTWARE BIT IN TO CARRY
016256  103005                          BCC     2$              ;BR IF CARRY CLEAR
016260  004737  030226                  JSR     PC,GETSI        ;GET THE WINDOW
016264  103406                          BCS     3$              ;BR IF BIT IS A MARK
016266  104006                          ERROR   6               ;ERROR BIT WAS A SPACE
016270  000404                          BR      3$              ;CONTINE WITH TEST
016272  004737  030226          2$:     JSR     PC,GETSI        ;GET THE WINDOW
016276  103001                          BCC     3$              ;BR IF BIT IS A SPACE
016300  104006                          ERROR   6               ;ERROR BIT WAS A MARK
016302                          3$:
016302  005203                          INC     R3              ;NEXT BIT
016304  022703  000010                  CMP     #10,R3          ;DONE YET?
016310  001357                          BNE     1$              ;BR IF NO
016312  104413  000014                  DATACLK,        14      ;CLOCK TRANSMITTER 14 MORE TICKS
016316  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016320  021264                          021264                  ;PORT4 LU-13
016322  032761  000040  000004          BIT     #BIT5,4(R1)     ;RTS SHOULD BE CLEAR NOW
016330  001401                          BEQ     4$              ;BR IF YES
016332  104034                          ERROR   34              ;ERROR, RTS NOT CLEAR
016334                          4$:


                                        ;*************************** TEST 20 ***********************
                                        ;*DDCMP TRANSMITTER TEST
```

```
3558                                            ;*SINGLE CLOCK THE CHARACTER 125
3559                                            ;*VERIFY EACH BIT POSITION AS IT
3560                                            ;*PASSES THE BIT WINDOW (SI BIT)
3561                                            ;*ON AN ERROR, R3 CONTAINS BIT POSITION OF FAILURE
3562                                            ;;*****************************************************************
3563
3564                                            ;  TEST 20
3565                                            ;-------------
3566                                        ;;*****************************************************************
3567  016334  000004                    TST20:  SCOPE
3568  016336  012737  000020  001202            MOV     #20,$TSTNM              ; LOAD THE NO. OF THIS TEST
3569  016344  012737  016516  001442            MOV     #TST21,NEXT             ; POINT TO THE START OF NEXT TEST.
3570                                                                    ;R1 CONTAINS BASE KMC11 ADDRESS
3571  016352  104410                           MSTCLR                  ;MASTER CLEAR KMC11
3572  016354  012711  004000                   MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
3573  016360  004737  030412                   JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
3574  016364  012761  000001  000004           MOV     #1,4(R1)        ;SET BIT0 IN PORT4
3575  016372  104412                           ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3576  016374  122111                           122111                  ;SET SOM!
3577  016376  012705  000125                   MOV     #125,R5 ;LOAD CHARACTER IN R5 FOR TYPEOUT
3578  016402  004737  030412                   JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
3579  016406  010561  000004                   MOV     R5,4(R1)        ;LOAD PORT4 WITH CHARACTER
3580  016412  104412                           ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3581  016414  122110                           122110                  ;LOAD OUT DATA
3582  016416  004737  030260                   JSR     PC,OCOR         ;WAIT FOR OCOR TO SET
3583  016422  005003                           CLR     R3              ;CLEAR BIT COUNTER
3584  016424  010502                           MOV     R5,R2           ;LOAD CHARACTER IN R2
3585  016426  104413  000002                   DATACLK,        2       ;2 TICKS TO SET UP TRANSMITTER
3586  016432  104413  000001            1$:    DATACLK,        1       ;SHIFT NEXT BIT IN THE WINDOW (SI BIT)
3587  016436  106002                           RORB    R2              ;SHIFT NEXT SOFTWARE BIT IN TO CARRY
3588  016440  103005                           BCC     2$              ;BR IF CARRY CLEAR
3589  016442  004737  030226                   JSR     PC,GETSI        ;GET THE WINDOW
3590  016446  103406                           BCS     3$              ;BR IF BIT IS A MARK
3591  016450  104006                           ERROR   6               ;ERROR BIT WAS A SPACE
3592  016452  000404                           BR      3$              ;CONTINE WITH TEST
3593  016454  004737  030226            2$:    JSR     PC,GETSI        ;GET THE WINDOW
3594  016460  103001                           BCC     3$              ;BR IF BIT IS A SPACE
3595  016462  104006                           ERROR   6               ;ERROR BIT WAS A MARK
3596  016464                            3$:
3597  016464  005203                           INC     R3              ;NEXT BIT
3598  016466  022703  000010                   CMP     #10,R3          ;DONE YET?
3599  016472  001357                           BNE     1$              ;BR IF NO
3600  016474  104413  000014                   DATACLK,        14      ;CLOCK TRANSMITTER 14 MORE TICKS
3601  016500  104412                           ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3602  016502  021264                           021264                  ;PORT4 LU-13
3603  016504  032761  000040  000004           BIT     #BIT5,4(R1)     ;RTS SHOULD BE CLEAR NOW
3604  016512  001401                           BEQ     4$              ;BR IF YES
3605  016514  104034                           ERROR   34              ;ERROR, RTS NOT CLEAR
3606  016516                            4$:
3607
3608
3609                                            ;***************************** TEST 21 ****************************
3610                                            ;*DDCMP TRANSMITTER TEST
3611                                            ;*SINGLE CLOCK THE CHARACTER 252
3612                                            ;*VERIFY EACH BIT POSITION AS IT
3613                                            ;*PASSES THE BIT WINDOW (SI BIT)
```

```
                                        ;*ON AN ERROR, R3 CONTAINS BIT POSITION OF FAILURE
                                        ;;**************************************************************
                                        ;  TEST 21
                                        ;-------------
                                        ;;**************************************************************
016516  000004                TST21:  SCOPE
016520  012737  000021  001202        MOV     #21,$TSTNM              ; LOAD THE NO. OF THIS TEST
016526  012737  016700  001442        MOV     #TST22,NEXT             ; POINT TO THE START OF NEXT TEST.
                                                                ;R1 CONTAINS BASE KMC11 ADDRESS
016534  104410                      MSTCLR                          ;MASTER CLEAR KMC11
016536  012711  004000              MOV     #BIT11,(R1)             ;SET LINE UNIT LOOP
016542  004737  030412              JSR     PC,OUTRDY               ;WAIT FOR OUT-READY
016546  012761  000001  000004      MOV     #1,4(R1)                ;SET BIT0 IN PORT4
016554  104412                      ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016556  122111                      122111                          ;SET SOM!
016560  012705  000252              MOV     #252,R5 ;LOAD CHARACTER IN R5 FOR TYPEOUT
016564  004737  030412              JSR     PC,OUTRDY               ;WAIT FOR OUT-READY
016570  010561  000004              MOV     R5,4(R1)                ;LOAD PORT4 WITH CHARACTER
016574  104412                      ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016576  122110                      122110                          ;LOAD OUT DATA
016600  004737  030260              JSR     PC,OCOR                 ;WAIT FOR OCOR TO SET
016604  005003                      CLR     R3                      ;CLEAR BIT COUNTER
016606  010502                      MOV     R5,R2                   ;LOAD CHARACTER IN R2
016610  104413  000002              DATACLK,        2               ;2 TICKS TO SET UP TRANSMITTER
016614  104413  000001        1$:   DATACLK,        1               ;SHIFT NEXT BIT IN THE WINDOW (SI BIT)
016620  106002                      RORB    R2                      ;SHIFT NEXT SOFTWARE BIT IN TO CARRY
016622  103005                      BCC     2$                      ;BR IF CARRY CLEAR
016624  004737  030226              JSR     PC,GETSI                ;GET THE WINDOW
016630  103406                      BCS     3$                      ;BR IF BIT IS A MARK
016632  104006                      ERROR   6                       ;ERROR BIT WAS A SPACE
016634  000404                      BR      3$                      ;CONTINE WITH TEST
016636  004737  030226        2$:   JSR     PC,GETSI                ;GET THE WINDOW
016642  103001                      BCC     3$                      ;BR IF BIT IS A SPACE
016644  104006                      ERROR   6                       ;ERROR BIT WAS A MARK
016646                      3$:
016646  005203                      INC     R3                      ;NEXT BIT
016650  022703  000010              CMP     #10,R3                  ;DONE YET?
016654  001357                      BNE     1$                      ;BR IF NO
016656  104413  000014              DATACLK,        14              ;CLOCK TRANSMITTER 14 MORE TICKS
016662  104412                      ROMCLK                          ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
016664  021264                      021264                          ;PORT4 LU-13
016666  032761  000040  000004      BIT     #BIT5,4(R1)             ;RTS SHOULD BE CLEAR NOW
016674  001401                      BEQ     4$                      ;BR IF YES
016676  104034                      ERROR   34                      ;ERROR, RTS NOT CLEAR
016700                      4$:

                                        ;**************************** TEST 22 ***************************
                                        ;*DDCMP TRANSMITTER TEST
                                        ;*SINGLE CLOCK THE CHARACTER 377
                                        ;*VERIFY EACH BIT POSITION AS IT
                                        ;*PASSES THE BIT WINDOW (SI BIT)
                                        ;*ON AN ERROR, R3 CONTAINS BIT POSITION OF FAILURE
                                        ;;**************************************************************
```

```
3670                                        ;  TEST 22
3671                                        ;-------------
3672                                        ;;*****************************************************************
3673  016700  000004                  TST22:  SCOPE
3674  016702  012737  000022  001202          MOV     #22,$TSTNM              ; LOAD THE NO. OF THIS TEST
3675  016710  012737  017062  001442          MOV     #TST23,NEXT             ; POINT TO THE START OF NEXT TEST.
3676                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
3677  016716  104410                          MSTCLR                  ;MASTER CLEAR KMC11
3678  016720  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
3679  016724  004737  030412                  JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
3680  016730  012761  000001  000004          MOV     #1,4(R1)        ;SET BIT0 IN PORT4
3681  016736  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3682  016740  122111                          122111                  ;SET SOM!
3683  016742  012705  000377                  MOV     #377,R5 ;LOAD CHARACTER IN R5 FOR TYPEOUT
3684  016746  004737  030412                  JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
3685  016752  010561  000004                  MOV     R5,4(R1)        ;LOAD PORT4 WITH CHARACTER
3686  016756  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3687  016760  122110                          122110                  ;LOAD OUT DATA
3688  016762  004737  030260                  JSR     PC,OCOR         ;WAIT FOR OCOR TO SET
3689  016766  005003                          CLR     R3              ;CLEAR BIT COUNTER
3690  016770  010502                          MOV     R5,R2           ;LOAD CHARACTER IN R2
3691  016772  104413  000002                  DATACLK,        2       ;2 TICKS TO SET UP TRANSMITTER
3692  016776  104413  000001          1$:     DATACLK,        1       ;SHIFT NEXT BIT IN THE WINDOW (SI BIT)
3693  017002  106002                          RORB    R2              ;SHIFT NEXT SOFTWARE BIT IN TO CARRY
3694  017004  103003                          BCC     2$              ;BR IF CARRY CLEAR
3695  017006  004737  030226                  JSR     PC,GETSI        ;GET THE WINDOW
3696  017012  103406                          BCS     3$              ;BR IF BIT IS A MARK
3697  017014  104006                          ERROR   6               ;ERROR BIT WAS A SPACE
3698  017016  000404                          BR      3$              ;CONTINE WITH TEST
3699  017020  004737  030226          2$:     JSR     PC,GETSI        ;GET THE WINDOW
3700  017024  103001                          BCC     3$              ;BR IF BIT IS A SPACE
3701  017026  104006                          ERROR   6               ;ERROR BIT WAS A MARK
3702  017030                          3$:
3703  017030  005203                          INC     R3              ;NEXT BIT
3704  017032  022703  000010                  CMP     #10,R3          ;DONE YET?
3705  017036  001357                          BNE     1$              ;BR IF NO
3706  017040  104413  000014                  DATACLK,        14      ;CLOCK TRANSMITTER 14 MORE TICKS
3707  017044  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3708  017046  021264                          021264                  ;PORT4 LU-13
3709  017050  032761  000040  000004          BIT     #BIT5,4(R1)     ;RTS SHOULD BE CLEAR NOW
3710  017056  001401                          BEQ     4$              ;BR IF YES
3711  017060  104034                          ERROR   34              ;ERROR, RTS NOT CLEAR
3712  017062                          4$:
3713
3714
3715                                        ;*************************** TEST 23 ***************************
3716                                        ;*DDCMP TRANSMITTER TEST
3717                                        ;*SINGLE CLOCK A BINARY COUNT PATTERN
3718                                        ;*VERIFY EACH BIT POSITION AS IT
3719                                        ;*PASSES THE BIT WINDOW (SI BIT)
3720                                        ;*ON AN ERROR, R3 CONTAINS BIT POSITION OF FAILURE
3721                                        ;*AND R5 CONTAINS THE CHARACTER THAT FAILED
3722                                        ;;*****************************************************************
3723
3724                                        ;  TEST 23
3725                                        ;-------------
```

```
                        ;;*****************************************************************
017062  000004          TST23:  SCOPE
017064  012737  000023  001202          MOV     #23,$TSTNM              ; LOAD THE NO. OF THIS TEST
017072  012737  017270  001442          MOV     #TST24,NEXT             ; POINT TO THE START OF NEXT TEST.
                                                                ;R1 CONTAINS BASE KMC11 ADDRESS
017100  104410                          MSTCLR                  ;MASTER CLEAR KMC11
017102  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
017106  005003                          CLR     R3              ;R3 CONTAINS BIT COUNT
017110  005004                          CLR     R4              ;R4 CONTAINS CHAR TO BE LOADED IN SILO
017112  005005                          CLR     R5              ;R5 CONTAINS CHARACTER CURRENTLY BEING SHIFTED OUT
017114  004737  030412                  JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
017120  012761  000001  000004          MOV     #1,4(R1)        ;SET BIT0 IN PORT4
017126  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
017130  122111                          122111                  ;SET SOM!
017132  004737  030412                  JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
017136  010461  000004                  MOV     R4,4(R1)        ;LOAD PORT4 WITH CHARACTER
017142  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
017144  122110                          122110                  ;LOAD OUT DATA
017146  005204                          INC     R4              ;INCREMENT TO NEXT CHARACTER
017150  004737  030412                  JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
017154  010461  000004                  MOV     R4,4(R1)        ;LOAD PORT4 WITH CHARACTER
017160  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
017162  122110                          122110                  ;LOAD OUT DATA
017164  004737  030260                  JSR     PC,OCOR         ;WAIT FOR OCOR TO SET
017170  104413  000002                  DATACLK,        2       ;2 TICKS TO SET UP TRANSMITTER
017174  005003                  4$:     CLR     R3              ;CLEAR BIT COUNTER
017176  010502                          MOV     R5,R2           ;LOAD CHARACTER IN R2
017200  104413  000001          1$:     DATACLK,        1       ;SHIFT NEXT BIT IN THE WINDOW (SI BIT)
017204  106002                          RORB    R2              ;SHIFT NEXT SOFTWARE BIT IN TO CARRY
017206  103005                          BCC     2$              ;BR IF CARRY CLEAR
017210  004737  030226                  JSR     PC,GETSI        ;GET THE WINDOW
017214  103406                          BCS     3$              ;BR IF BIT IS A MARK
017216  104006                          ERROR   6               ;ERROR BIT WAS A SPACE
017220  000404                          BR      3$              ;CONTINE WITH TEST
017222  004737  030226          2$:     JSR     PC,GETSI        ;GET THE WINDOW
017226  103001                          BCC     3$              ;BR IF BIT IS A SPACE
017230  104006                          ERROR   6               ;ERROR BIT WAS A MARK
017232                          3$:
017232  005203                          INC     R3              ;NEXT BIT
017234  022703  000010                  CMP     #10,R3          ;DONE YET?
017240  001357                          BNE     1$              ;BR IF NO
017242  005204                          INC     R4              ;NEXT CHARACTER
017244  004737  030412                  JSR     PC,OUTRDY       ;WAIT FOR OUT-READY
017250  010461  000004                  MOV     R4,4(R1)        ;LOAD PORT4 WITH CHARACTER
017254  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
017256  122110                          122110                  ;LOAD OUT DATA
017260  005205                          INC     R5              ;NEXT CHARACTER
017262  022705  000400                  CMP     #400,R5         ;DONE YET?
017266  001342                          BNE     4$              ;BR IF NO
017270                          5$:


                                        ;***************************** TEST 24 ****************************
                                        ;*DDCMP STRIP SYNC TEST
                                        ;*SET LU LOOP, SINGLE STEP 5 SYNCS,
                                        ;*VERIFY THAT IN ACTIVE DOES NOT SET
```

```
3782                                    ;;*****************************************************************
3783
3784                                    ;  TEST 24
3785                                    ;-------------
3786                                ;;*****************************************************************
3787  017270  000004               TST24:  SCOPE
3788  017272  012737  000024  001202       MOV     #24,$TSTNM              ; LOAD THE NO. OF THIS TEST
3789  017300  012737  017356  001442       MOV     #TST25,NEXT             ; POINT TO THE START OF NEXT TEST.
3790                                                                ;R1 CONTAINS BASE KMC11 ADDRESS
3791  017306  104410                       MSTCLR                  ;MASTER CLEAR KMC11
3792  017310  012711  004000               MOV     #BIT11,(R1)     ;SET LU LOOP
3793  017314  012702  000012               MOV     #12,R2          ;SAVE LU REG FOR TYPEOUT
3794  017320  004737  030276               JSR     PC,SYNC         ;SINGLE CLOCK 5 SYNC CHARACTERS
3795  017324  000005                       5
3796  017326  104413  000054               DATACLK,        54
3797  017332  104412                       ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3798  017334  021244                       021244                  ;PORT4 LU12
3799  017336  016104  000004               MOV     4(R1),R4        ;PUT "FOUND" IN R4
3800  017342  042704  000277               BIC     #277,R4         ;CLEAR UNWANTED BITS
3801  017346  005005                       CLR     R5              ;PUT "EXPECTED" IN R5
3802  017350  120504                       CMPB    R5,R4           ;IS ACTIVE CLEAR?
3803  017352  001401                       BEQ     1$              ;BR IF YES
3804  017354  104040                       ERROR   40              ;ERROR ACTIVE IS NOT CLEAR
3805  017356                           1$:
3806
3807
3808                                    ;***************************** TEST 25 ****************************
3809                                    ;*DDCMP IN ACTIVE TEST
3810                                    ;*SET LU LOOP, SINGLE STEP 5 SYNCS AND A NON-SYNC (301)
3811                                    ;*VERIFY THAT IN ACTIVE IS SET
3812                                    ;*****************************************************************
3813
3814                                    ;  TEST 25
3815                                    ;-------------
3816                                ;;*****************************************************************
3817  017356  000004               TST25:  SCOPE
3818  017360  012737  000025  001202       MOV     #25,$TSTNM              ; LOAD THE NO. OF THIS TEST
3819  017366  012737  017446  001442       MOV     #TST26,NEXT             ; POINT TO THE START OF NEXT TEST.
3820                                                                ;R1 CONTAINS BASE KMC11 ADDRESS
3821  017374  104410                       MSTCLR                  ;MASTER CLEAR KMC11
3822  017376  012711  004000               MOV     #BIT11,(R1)     ;SET LU LOOP
3823  017402  012702  000012               MOV     #12,R2          ;SAVE LU REG FOR TYPEOUT
3824  017406  004737  030276               JSR     PC,SYNC         ;SINGLE CLOCK 5 SYNC CHARACTERS
3825  017412  000005                       5
3826  017414  104413  000064               DATACLK,        64
3827  017420  104412                       ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3828  017422  021244                       021244                  ;PORT4 LU12
3829  017424  016104  000004               MOV     4(R1),R4        ;PUT "FOUND" IN R4
3830  017430  042704  000277               BIC     #277,R4         ;CLEAR UNWANTED BITS
3831  017434  012705  000100               MOV     #BIT6,R5                ;PUT "EXPECTED" IN R5
3832  017440  120504                       CMPB    R5,R4           ;IS ACTIVE SET?
3833  017442  001401                       BEQ     1$              ;BR IF YES
3834  017444  104040                       ERROR   40              ;ERROR ACTIVE IS NOT SET
3835  017446                           1$:
3836
3837
```

```
                                        ;*************************** TEST 26 ***************************
                                        ;*DDCMP IN ACTIVE TEST
                                        ;*SET LU LOOP, SINGLE STEP 1 SYNC AND A NON-SYNC (301)
                                        ;*VERIFY THAT IN ACTIVE DOES NOT SET
                                        ;;*************************************************************

                                        ;  TEST 26
                                        ;-------------
                                    ;;*************************************************************
017446  000004                      TST26:  SCOPE
017450  012737  000026  001202              MOV     #26,$TSTNM              ; LOAD THE NO. OF THIS TEST
017456  012737  017534  001442              MOV     #TST27,NEXT             ; POINT TO THE START OF NEXT TEST.
                                                                    ;R1 CONTAINS BASE KMC11 ADDRESS
017464  104410                              MSTCLR                  ;MASTER CLEAR KMC11
017466  012711  004000                      MOV     #BIT11,(R1)     ;SET LU LOOP
017472  012702  000012                      MOV     #12,R2          ;SAVE LU REG FOR TYPEOUT
017476  004737  030276                      JSR     PC,SYNC         ;SINGLE CLOCK 1 SYNC CHARACTERS
017502  000001                              1
017504  104413  000024                      DATACLK,        24
017510  104412                              ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
017512  021244                              021244                  ;PORT4 LU12
017514  016104  000004                      MOV     4(R1),R4        ;PUT "FOUND" IN R4
017520  042704  000277                      BIC     #277,R4         ;CLEAR UNWANTED BITS
017524  005005                              CLR     R5              ;PUT "EXPECTED" IN R5
017526  120504                              CMPB    R5,R4           ;IS ACTIVE CLEAR?
017530  001401                              BEQ     1$              ;BR IF YES
017532  104040                              ERROR   40              ;ERROR ACTIVE IS NOT CLEAR
017534                                  1$:


                                        ;*************************** TEST 27 ***************************
                                        ;*DDCMP IN ACTIVE TEST
                                        ;*SET LU LOOP, SINGLE STEP 2 SYNCS AND A NON-SYNC (301)
                                        ;*VERIFY THAT IN ACTIVE IS SET
                                        ;;*************************************************************

                                        ;  TEST 27
                                        ;-------------
                                    ;;*************************************************************
017534  000004                      TST27:  SCOPE
017536  012737  000027  001202              MOV     #27,$TSTNM              ; LOAD THE NO. OF THIS TEST
017544  012737  017624  001442              MOV     #TST30,NEXT             ; POINT TO THE START OF NEXT TEST.
                                                                    ;R1 CONTAINS BASE KMC11 ADDRESS
017552  104410                              MSTCLR                  ;MASTER CLEAR KMC11
017554  012711  004000                      MOV     #BIT11,(R1)     ;SET LU LOOP
017560  012702  000012                      MOV     #12,R2          ;SAVE LU REG FOR TYPEOUT
017564  004737  030276                      JSR     PC,SYNC         ;SINGLE CLOCK 2 SYNC CHARACTERS
017570  000002                              2
017572  104413  000034                      DATACLK,        34
017576  104412                              ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
017600  021244                              021244                  ;PORT4 LU12
017602  016104  000004                      MOV     4(R1),R4        ;PUT "FOUND" IN R4
017606  042704  000277                      BIC     #277,R4         ;CLEAR UNWANTED BITS
017612  012705  000100                      MOV     #BIT6,R5                ;PUT "EXPECTED" IN R5
017616  120504                              CMPB    R5,R4           ;IS ACTIVE SET?
017620  001401                              BEQ     1$              ;BR IF YES
```

```
3894  017622  104040                        ERROR   40              ;ERROR ACTIVE IS NOT SET
3895  017624                          1$:
3896
3897
3898                                        ;*************************** TEST 30 ***************************
3899                                        ;*IN CLEAR TEST
3900                                        ;*SYNC UP RECEIVER AND TRANSMIT A CHARACTER
3901                                        ;*WAIT FOR IN RDY, THEN SET IN CLEAR
3902                                        ;*VERIFY THAT IN ACTIVE AND IN RDY ARE CLEARED
3903                                        ;:*************************************************************
3904
3905                                        ;  TEST 30
3906                                        ;-------------
3907                                    ;;*************************************************************
3908  017624  000004                  TST30:  SCOPE
3909  017626  012737  000030  001202         MOV     #30,$TSTNM              ; LOAD THE NO. OF THIS TEST
3910  017634  012737  017776  001442         MOV     #TST31,NEXT             ; POINT TO THE START OF NEXT TEST.
3911                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
3912  017642  104410                        MSTCLR                  ;MASTER CLEAR KMC11
3913  017644  012702  000012                MOV     #12,R2          ;SAVE REG ADDRESS IN R2 FOR TYPEOUT
3914  017650  012711  004000                MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
3915  017654  004737  030444                JSR     PC,CHAR         ;LOAD SILO WITH 3 SYNCS
3916  017660  000301                        301                     ;AND A NON-SYNC  (301)
3917  017662  104413  000053                DATACLK,        53      ;SINGLE CLOCK THE DATA
3918  017666  104414  000002                TIMER,  2               ;WAIT FOR INRDY
3919  017672  104412                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3920  017674  021244                        021244                  ;PORT4 LU 12
3921  017676  016104  000004                MOV     4(R1),R4        ;PUT "FOUND" IN R4
3922  017702  042704  000357                BIC     #357,R4         ;CLEAR UNWANTED BITS
3923  017706  012705  000020                MOV     #BIT4,R5                ;PUT "EXPECTED" IN R5
3924  017712  120504                        CMPB    R5,R4           ;IS INRDY SET?
3925  017714  001401                        BEQ     1$
3926  017716  104040                        ERROR   40              ;ERROR, INRDY IS NOT SET
3927  017720                          1$:
3928  017720  012761  000200  000004         MOV     #BIT7,4(R1)     ;LOAD PORT4
3929  017726  104412                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3930  017730  122112                        122112                  ;SET IN CLEAR
3931  017732  104412                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3932  017734  021244                        021244                  ;PORT4 LU 12
3933  017736  016104  000004                MOV     4(R1),R4        ;PUT "FOUND" IN R4
3934  017742  042704  000277                BIC     #277,R4         ;CLEAR UNWANTED BITS
3935  017746  005005                        CLR     R5              ;PUT "EXPECTED" IN R5
3936  017750  120504                        CMPB    R5,R4           ;IS IN ACTIVE CLEAR?
3937  017752  001401                        BEQ     2$
3938  017754  104040                        ERROR   40              ;ERROR, IN ACTIVE IS NOT CLEAR
3939  017756                          2$:
3940  017756  016104  000004                MOV     4(R1),R4        ;PUT "FOUND" IN R4
3941  017762  042704  000357                BIC     #357,R4         ;CLEAR UNWANTED BITS
3942  017766  005005                        CLR     R5              ;PUT "EXPECTED" IN R5
3943  017770  120504                        CMPB    R5,R4           ;IS INRDY CLEARED?
3944  017772  001401                        BEQ     3$
3945  017774  104040                        ERROR   40              ;ERROR, INRDY IS NOT CLEARED
3946  017776                          3$:
3947
3948
3949                                        ;*************************** TEST 31 ***************************
```

```
3950                                    ;*DDCMP BASIC RECEICER TEST
3951                                    ;*SYNC UP RECEIVER AND SINGLE CLOCK THE CHARACTER 0
3952                                    ;*VERIFY THAT IN RDY IS SET, AND THAT THE CHARACTER WAS RECEIVED
3953                                    ;;*****************************************************************
3954
3955                                    ;  TEST 31
3956                                    ;-------------
3957                                ;;*****************************************************************
3958  017776  000004                TST31:  SCOPE
3959  020000  012737  000031  001202        MOV     #31,$TSTNM              ; LOAD THE NO. OF THIS TEST
3960  020006  012737  020112  001442        MOV     #TST32,NEXT             ; POINT TO THE START OF NEXT TEST.
3961                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
3962  020014  104410                        MSTCLR                  ;MASTER CLEAR KMC11
3963  020016  012702  000012                MOV     #12,R2          ;SAVE REG ADDRESS IN R2 FOR TYPEOUT
3964  020022  012711  004000                MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
3965  020026  004737  030444                JSR     PC,CHAR         ;LOAD SILO WITH 3 SYNCS
3966  020032  000000                        0                       ;AND THE CHARACTER 0
3967  020034  104413  000053                DATACLK,        53      ;SINGLE CLOCK THE DATA
3968  020040  104414  000002                TIMER,  2               ;WAIT FOR INRDY
3969  020044  104412                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3970  020046  021244                        021244                  ;PORT4 LU 12
3971  020050  016104  000004                MOV     4(R1),R4        ;PUT "FOUND" IN R4
3972  020054  042704  000357                BIC     #357,R4         ;CLEAR UNWANTED BITS
3973  020060  012705  000020                MOV     #BIT4,R5                ;PUT "EXPECTED" IN R5
3974  020064  120504                        CMPB    R5,R4           ;IS INRDY SET?
3975  020066  001401                        BEQ     1$
3976  020070  104040                        ERROR   40              ;ERROR, INRDY IS NOT SET
3977  020072                        1$:
3978  020072  104412                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
3979  020074  021204                        021204                  ;PORT4 IN DATA
3980  020076  016104  000004                MOV     4(R1),R4        ;PUT "FOUND" IN R4
3981  020102  005005                        CLR     R5              ;PUT "EXPECTED" IN R5
3982  020104  120504                        CMPB    R5,R4           ;WAS A 0 RECEIVED?
3983  020106  001401                        BEQ     2$
3984  020110  104010                        ERROR   10              ;ERROR, RECEIVED DATA IS WRONG
3985  020112                        2$:
3986
3987
3988                                    ;***************************** TEST 32 ****************************
3989                                    ;*DDCMP BASIC RECEICER TEST
3990                                    ;*SYNC UP RECEIVER AND SINGLE CLOCK THE CHARACTER 125
3991                                    ;*VERIFY THAT IN RDY IS SET, AND THAT THE CHARACTER WAS RECEIVED
3992                                    ;;*****************************************************************
3993
3994                                    ;  TEST 32
3995                                    ;-------------
3996                                ;;*****************************************************************
3997  020112  000004                TST32:  SCOPE
3998  020114  012737  000032  001202        MOV     #32,$TSTNM              ; LOAD THE NO. OF THIS TEST
3999  020122  012737  020230  001442        MOV     #TST33,NEXT             ; POINT TO THE START OF NEXT TEST.
4000                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
4001  020130  104410                        MSTCLR                  ;MASTER CLEAR KMC11
4002  020132  012702  000012                MOV     #12,R2          ;SAVE REG ADDRESS IN R2 FOR TYPEOUT
4003  020136  012711  004000                MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
4004  020142  004737  030444                JSR     PC,CHAR         ;LOAD SILO WITH 3 SYNCS
4005  020146  000125                        125                     ;AND THE CHARACTER 125
```

```
4006  020150  104413  000053          DATACLK,        53      ;SINGLE CLOCK THE DATA
4007  020154  104414  000002          TIMER,  2               ;WAIT FOR INRDY
4008  020160  104412                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4009  020162  021244                  021244                  ;PORT4 LU 12
4010  020164  016104  000004          MOV     4(R1),R4        ;PUT "FOUND" IN R4
4011  020170  042704  000357          BIC     #357,R4         ;CLEAR UNWANTED BITS
4012  020174  012705  000020          MOV     #BIT4,R5                ;PUT "EXPECTED" IN R5
4013  020200  120504                  CMPB    R5,R4           ;IS INRDY SET?
4014  020202  001401                  BEQ     1$
4015  020204  104040                  ERROR   40              ;ERROR, INRDY IS NOT SET
4016  020206                  1$:
4017  020206  104412                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4018  020210  021204                  021204                  ;PORT4 IN DATA
4019  020212  016104  000004          MOV     4(R1),R4        ;PUT "FOUND" IN R4
4020  020216  012705  000125          MOV     #125,R5         ;PUT "EXPECTED" IN R5
4021  020222  120504                  CMPB    R5,R4           ;WAS A 125 RECEIVED?
4022  020224  001401                  BEQ     2$
4023  020226  104010                  ERROR   10              ;ERROR, RECEIVED DATA IS WRONG
4024  020230                  2$:
4025
4026                                  ;****************************** TEST 33 ****************************
4027                                  ;*DDCMP BASIC RECEICER TEST
4028                                  ;*SYNC UP RECEIVER AND SINGLE CLOCK THE CHARACTER 252
4029                                  ;*VERIFY THAT IN RDY IS SET, AND THAT THE CHARACTER WAS RECEIVED
4030                                  ;;*************************************************************
4031
4032                                  ;  TEST 33
4033                                  ;-------------
4034
4035                          ;;*****************************************************************
4036  020230  000004          TST33:  SCOPE
4037  020232  012737  000033  001202          MOV     #33,$TSTNM              ; LOAD THE NO. OF THIS TEST
4038  020240  012737  020346  001442          MOV     #TST34,NEXT             ; POINT TO THE START OF NEXT TEST.
4039                                  ;R1 CONTAINS BASE KMC11 ADDRESS
4040  020246  104410                  MSTCLR                  ;MASTER CLEAR KMC11
4041  020250  012702  000012          MOV     #12,R2          ;SAVE REG ADDRESS IN R2 FOR TYPEOUT
4042  020254  012711  004000          MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
4043  020260  004737  030444          JSR     PC,CHAR         ;LOAD SILO WITH 3 SYNCS
4044  020264  000252                  252                     ;AND THE CHARACTER 252
4045  020266  104413  000053          DATACLK,        53      ;SINGLE CLOCK THE DATA
4046  020272  104414  000002          TIMER,  2               ;WAIT FOR INRDY
4047  020276  104412                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4048  020300  021244                  021244                  ;PORT4 LU 12
4049  020302  016104  000004          MOV     4(R1),R4        ;PUT "FOUND" IN R4
4050  020306  042704  000357          BIC     #357,R4         ;CLEAR UNWANTED BITS
4051  020312  012705  000020          MOV     #BIT4,R5                ;PUT "EXPECTED" IN R5
4052  020316  120504                  CMPB    R5,R4           ;IS INRDY SET?
4053  020320  001401                  BEQ     1$
4054  020322  104040                  ERROR   40              ;ERROR, INRDY IS NOT SET
4055  020324                  1$:
4056  020324  104412                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4057  020326  021204                  021204                  ;PORT4 IN DATA
4058  020330  016104  000004          MOV     4(R1),R4        ;PUT "FOUND" IN R4
4059  020334  012705  000252          MOV     #252,R5         ;PUT "EXPECTED" IN R5
4060  020340  120504                  CMPB    R5,R4           ;WAS A 252 RECEIVED?
4061  020342  001401                  BEQ     2$
```

```
 4062  020344  104010                          ERROR   10              ;ERROR, RECEIVED DATA IS WRONG
 4063  020346                          2$:
 4064
 4065
 4066                                          ;*************************** TEST 34 ***************************
 4067                                          ;*DDCMP BASIC RECEICER TEST
 4068                                          ;*SYNC UP RECEIVER AND SINGLE CLOCK THE CHARACTER 377
 4069                                          ;*VERIFY THAT IN RDY IS SET, AND THAT THE CHARACTER WAS RECEIVED
 4070                                          ;;***********************************************************************
 4071
 4072                                          ;  TEST 34
 4073                                          ;-------------
 4074                                  ;;*****************************************************************
 4075  020346  000004                  TST34:  SCOPE
 4076  020350  012737  000034  001202          MOV     #34,$TSTNM              ; LOAD THE NO. OF THIS TEST
 4077  020356  012737  020464  001442          MOV     #TST35,NEXT             ; POINT TO THE START OF NEXT TEST.
 4078                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
 4079  020364  104410                          MSTCLR                  ;MASTER CLEAR KMC11
 4080  020366  012702  000012                  MOV     #12,R2          ;SAVE REG ADDRESS IN R2 FOR TYPEOUT
 4081  020372  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
 4082  020376  004737  030444                  JSR     PC,CHAR         ;LOAD SILO WITH 3 SYNCS
 4083  020402  000377                          377                     ;AND THE CHARACTER 377
 4084  020404  104413  000053                  DATACLK,        53      ;SINGLE CLOCK THE DATA
 4085  020410  104414  000002                  TIMER,  2               ;WAIT FOR INRDY
 4086  020414  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 4087  020416  021244                          021244                  ;PORT4 LU 12
 4088  020420  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
 4089  020424  042704  000357                  BIC     #357,R4         ;CLEAR UNWANTED BITS
 4090  020430  012705  000020                  MOV     #BIT4,R5                ;PUT "EXPECTED" IN R5
 4091  020434  120504                          CMPB    R5,R4           ;IS INRDY SET?
 4092  020436  001401                          BEQ     1$
 4093  020440  104040                          ERROR   40              ;ERROR, INRDY IS NOT SET
 4094  020442                          1$:
 4095  020442  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 4096  020444  021204                          021204                  ;PORT4 IN DATA
 4097  020446  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
 4098  020452  012705  000377                  MOV     #377,R5         ;PUT "EXPECTED" IN R5
 4099  020456  120504                          CMPB    R5,R4           ;WAS A 377 RECEIVED?
 4100  020460  001401                          BEQ     2$
 4101  020462  104010                          ERROR   10              ;ERROR, RECEIVED DATA IS WRONG
 4102  020464                          2$:
 4103
 4104
 4105                                          ;*************************** TEST 35 ***************************
 4106                                          ;*DDCMP DATA TEST
 4107                                          ;*THIS TEST SINGLE STEPS A BINARY COUNT PATTERN
 4108                                          ;*CHECKING EACH CHARACTER AS IT IS RECEIVED
 4109                                          ;;***********************************************************************
 4110
 4111                                          ;  TEST 35
 4112                                          ;-------------
 4113                                  ;;*****************************************************************
 4114  020464  000004                  TST35:  SCOPE
 4115  020466  012737  000035  001202          MOV     #35,$TSTNM              ; LOAD THE NO. OF THIS TEST
 4116  020474  012737  020514  001442          MOV     #TST36,NEXT             ; POINT TO THE START OF NEXT TEST.
 4117                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
```

```
 4118  020502  104410                          MSTCLR                  ;MASTER CLEAR KMC11
 4119  020504  005037  031062                  CLR     SCHAR           ;START BINARY COUNT AT ZERO
 4120  020510  005037  031064                  CLR     STUFLG          ;CLEAR BITSTUFF FLAG
 4121  020514  005002                          CLR     R2              ;R2 IS "EXPECTED" DATA
 4122  020516  012703  000073                  MOV     #73,R3          ;R3 IS CHARACTER COUNT
 4123  020522  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
 4124  020526  004737  030622                  JSR     PC,S:LOLD       ;LOAD SILO WITH COUNT PATTERN
 4125  020532  104413  000043                  DATACLK,        43      ;SYNC RECEIVER AND GET IT ACTIVE
 4126  020536  104413  000730          1$:     DATACLK,        730     ;CLOCK IN 73 CHARACTERS
 4127  020542  004737  031066          4$:     JSR     PC,INRDY        ;WAIT FOR INRDY
 4128  020546  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 4129  020550  021204                          021204                  ;PORT4 IN DATA
 4130  020552  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
 4131  020556  010205                          MOV     R2,R5           ;PUT "EXPECTED" IN R5
 4132  020560  120504                          CMPB    R5,R4           ;IS DATA CORRECT?
 4133  020562  001401                          BEQ     2$              ;BR IF YES
 4134  020564  104010                          ERROR   10              ;DATA ERROR
 4135  020566  005202          2$:     INC     R2              ;NEXT CHARACTER
 4136  020570  022702  000400                  CMP     #400,R2         ;ALL DONE?
 4137  020574  001407                          BEQ     3$              ;BR IF YES
 4138  020576  005303                          DEC     R3              ;DECREMENT CHARACTER COUNT
 4139  020600  001360                          BNE     4$              ;BR IF SILO NOT EMPTY
 4140  020602  004737  030622                  JSR     PC,SILOLD       ;LOAD SILO WITH MORE OF COUNT PATTERN
 4141  020606  012703  000073                  MOV     #73,R3          ;RELOAD CHARACTER COUNT
 4142  020612  000751                          BR      1$              ;CONTINUE
 4143  020614                          3$:
 4144
 4145
 4146                                  ;***************************** TEST 36 ****************************
 4147                                  ;*DDCMP DATA TEST
 4148                                  ;*THIS TEST SINGLE STEPS A BINARY COUNT PATTERN
 4149                                  ;*CHECKING EACH CHARACTER AS IT IS RECEIVED
 4150                                  ;*THIS TEST IS EXACTLY THE SAME AS THE LAST TEST,
 4151                                  ;*EXCEPT LINE UNIT LOOP IS SET IN LU REGISTER 12
 4152                                  ;;**********************************************************************
 4153
 4154                                  ;  TEST 36
 4155                                  ;-------------
 4156                          ;;**********************************************************************
 4157  020614  000004          TST36:  SCOPE
 4158  020616  012737  000036  001202          MOV     #36,$TSTNM              ; LOAD THE NO. OF THIS TEST
 4159  020624  012737  020754  001442          MOV     #TST37,NEXT             ; POINT TO THE START OF NEXT TEST.
 4160                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
 4161  020632  104410                          MSTCLR                  ;MASTER CLEAR KMC11
 4162  020634  005037  031062                  CLR     SCHAR           ;START BINARY COUNT AT ZERO
 4163  020640  005037  031064                  CLR     STUFLG          ;CLEAR BITSTUFF FLAG
 4164  020644  005002                          CLR     R2              ;R2 IS "EXPECTED" DATA
 4165  020646  012703  000073                  MOV     #73,R3          ;R3 IS CHARACTER COUNT
 4166  020652  005011                          CLR     (R1)            ;CLEAR LU LOOP IN MAINT REG
 4167  020654  012761  000040  000004          MOV     #BIT5,4(R1)     ;LOAD PORT4
 4168  020662  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 4169  020664  122112                          122112                  ;SET LU LOOP IN LU REG 12
 4170  020666  004737  030622                  JSR     PC,SILOLD       ;LOAD SILO WITH COUNT PATTERN
 4171  020672  104413  000043                  DATACLK,        43      ;SYNC RECEIVER AND GET IT ACTIVE
 4172  020676  104413  000730          1$:     DATACLK,        730     ;CLOCK IN 73 CHARACTERS
 4173  020702  004737  031066          4$:     JSR     PC,INRDY        ;WAIT FOR INRDY
```

```
4174  020706  104412                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4175  020710  021204                        021204                  ;PORT4 IN DATA
4176  020712  016104  000004                MOV     4(R1),R4        ;PUT "FOUND" IN R4
4177  020716  010205                        MOV     R2,R5           ;PUT "EXPECTED" IN R5
4178  020720  120504                        CMPB    R5,R4           ;IS DATA CORRECT?
4179  020722  001401                        BEQ     2$              ;BR IF YES
4180  020724  104010                        ERROR   10              ;DATA ERROR
4181  020726  005202              2$:       INC     R2              ;NEXT CHARACTER
4182  020730  022702  000400                CMP     #400,R2         ;ALL DONE?
4183  020734  001407                        BEQ     3$              ;BR IF YES
4184  020736  005303                        DEC     R3              ;DECREMENT CHARACTER COUNT
4185  020740  001360                        BNE     4$              ;BR IF SILO NOT EMPTY
4186  020742  004737  030622                JSR     PC,SILOLD       ;LOAD SILO WITH MORE OF COUNT PATTERN
4187  020746  012703  000073                MOV     #73,R3          ;RELOAD CHARACTER COUNT
4188  020752  000751                        BR      1$              ;CONTINUE
4189  020754                        3$:
4190
4191
4192                                        ;***************************** TEST 37 ****************************
4193                                        ;*TRANSMITTER MARK TEST
4194                                        ;*SINGLE CLOCK 3 SYNCS AND A 301 AND 20 EXTRA
4195                                        ;*CLOCK TICKS, VERIFY THAT A 301, A 377 AND A 377
4196                                        ;*WERE RECEIVED INDICATING THAT THE TRANSMITTER WENT
4197                                        ;*TO A MARK STATE FOR 16 BITS WHEN OUT SILO WAS EMPTY
4198                                        ;;**********************************************************************
4199
4200                                        ;  TEST 37
4201                                        ;-------------
4202                                        ;;**********************************************************************
4203  020754  000004              TST37:    SCOPE
4204  020756  012737  000037  001202        MOV     #37,$TSTNM              ; LOAD THE NO. OF THIS TEST
4205  020764  012737  021114  001442        MOV     #TST40,NEXT             ; POINT TO THE START OF NEXT TEST.
4206                                                                ;R1 CONTAINS BASE KMC11 ADDRESS
4207  020772  104410                        MSTCLR                  ;MASTER CLEAR KMC11
4208  020774  012711  004000                MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
4209  021000  004737  030444                JSR     PC,CHAR         ;LOAD SILO WITH 3 SYNCS
4210  021004  000301                        301                     ;AND A 301
4211  021006  104413  000073                DATACLK,        73      ;CLOCK THE 301 IN AND 20 EXTRA TICKS
4212  021012  004737  031066                JSR     PC,INRDY        ;WAIT FOR INRDY
4213  021016  104412                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4214  021020  021204                        021204                  ;PORT4 IN DATA
4215  021022  016104  000004                MOV     4(R1),R4        ;PUT "FOUND" IN R4
4216  021026  012705  000301                MOV     #301,R5         ;PUT "EXPECTED" IN R5
4217  021032  120504                        CMPB    R5,R4           ;WAS A 301 RECEIVED?
4218  021034  001401                        BEQ     1$
4219  021036  104010                        ERROR   10              ;ERROR FIRST CHARACTER INCORRECT
4220  021040  004737  031066        1$:     JSR     PC,INRDY        ;WAIT FOR INRDY
4221  021044  104412                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
4222  021046  021204                        021204                  ;PORT4 IN DATA
4223  021050  016104  000004                MOV     4(R1),R4        ;PUT "FOUND" IN R4
4224  021054  012705  000377                MOV     #377,R5         ;PUT "EXPECTED" IN R5
4225  021060  120504                        CMPB    R5,R4           ;WAS A 377 RECEIVED?
4226  021062  001401                        BEQ     2$
4227  021064  104010                        ERROR   10              ;ERROR, 377 WAS NOT RECEIVED
4228  021066  004737  031066        2$:     JSR     PC,INRDY        ;WAIT FOR INRDY
4229  021072  104412                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
```

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                                                021204                  ;PORT4 IN DATA
                                                MOV     4(R1),R4        ;PUT "FOUND" IN R4
                                                MOV     #377,R5         ;PUT "EXPECTED" IN R5
                                                CMPB    R5,R4           ;WAS A 377 RECEIVED?
                                                BEQ     3$
                                                ERROR   10              ;ERROR, 177 WAS NOT RECEIVED
                                        3$:

                                                ;*************************** TEST 40 ***************************
                                                ;*CABLE TURNAROUND TEST
                                                ;*CLEAR LINE UNIT LOOP, SET DTR
                                                ;*VERIFY THAT RING AND MODEM READY ARE SET
                                                ;*CLEAR DTR, VERIFY THAT RING AND MRDY ARE CLEARED
                                                ;;***********************************************************

                                                ;  TEST 40
                                                ;-------------
                                        ;;***********************************************************
021114  000004                          TST40:  SCOPE
021116  012737  000040  001202                  MOV     #40,$TSTNM              ; LOAD THE NO. OF THIS TEST
021124  012737  021342  001442                  MOV     #TST41,NEXT             ; POINT TO THE START OF NEXT TEST.
                                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
021132  104410                                  MSTCLR                  ;MASTER CLEAR KMC11
021134  032737  020000  002050                  BIT     #BIT13,STAT1    ;IS LINE UNIT M8202?
021142  001004                                  BNE     .+12            ;BR IF YES (DO TEST EVEN IF NO LOOP-BACK CONN)
021144  032737  040000  002050                  BIT     #BIT14,STAT1    ;IS TURNAROUND CONNECTOR ON?
021152  001473                                  BEQ     2$              ;SKIP TEST IF NO
021154  005011                                  CLR     (R1)            ;CLEAR LINE UNIT LOOP
021156  012761  000100  000004                  MOV     #100,4(R1)      ;LOAD PORT4
021164  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021166  122113                                  122113                  ;SET DTR
021170  104414  000002                          TIMER,  2               ;WAIT
021174  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021176  021264                                  021264                  ;PORT4_LU13
021200  016104  000004                          MOV     4(R1),R4        ; PUT FOUND IN R4       ++++NEW
021204  042704  000023                          BIC     #23,R4          ; CLEAR JUNK
021210  012705  000310                          MOV     #310,R5         ; GET EXPECTED.
021214  032737  020000  002050                  BIT     #BIT13,STAT1    ; IS LINE UNIT M8202?
021222  001402                                  BEQ     .+6
021224  042705  000200                          BIC     #BIT7,R5        ; NO RING ON M8202

021230  032737  000004  002054                  BIT     #BIT2,STAT3     ; IS THIS V.35 MODEM?
021236  001402                                  BEQ     3$              ; NO THEN GO AHEAD.

021240  042705  000200                          BIC     #BIT7,R5        ; YES-NO RING ON V.35 MODEM
021244                                  3$:
021244  020504                                  CMP     R5,R4           ; ARE RING AND MODEM READY SET?
021246  001401                                  BEQ     1$              ; WARNING! IF V.35 AND AUTO STARTED,
                                                                        ; YOU WILL GET THIS ERROR. YOU MUST
                                                                        ; MANUALL NASWER THE QUESTIONS FOR V.35.
021250  104011                                  ERROR   11              ;ERROR, RING OR MRDY NOT SET
021252  005061  000004                  1$:     CLR     4(R1)           ;CLEAR PORT4
021256  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021260  122113                                  122113                  ;CLEAR DTR
021262  104414  000002                          TIMER,  2
```

```
 4286  021266  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 4287  021270  021264                          021264                  ;PORT4 LU13
 4288  021272  016104  000004                  MOV     4(R1),R4        ; PUR FOUND IN R4               +++NEW
 4289  021276  042704  000023                  BIC     #23,R4          ; STRIP JUNK
 4290  021302  005005                          CLR     R5              ; SET EXPECTED.
 4291  021304  032737  020000  002050          BIT     #BIT13,STAT1    ; IS THIS A M8202?
 4292  021312  001402                          BEQ     .+6
 4293  021314  052705  000010                  BIS     #BIT3,R5        ; YES THEN EXPECT MRDY SET.
 4294  021320  032737  000004  002054          BIT     #BIT2,STAT3     ; IS THIS V.35?
 4295  021326  001402                          BEQ     4$
 4296  021330  042704  000200                  BIC     #BIT7,R4
 4297  021334                          4$:
 4298  021334  120405                          CMPB    R4,R5           ; ARE RING AND MRDY CLEAR?
 4299  021336  001401                          BEQ     2$
 4300                                          ; WARNING! YOU MAY GET THIS ERROR IF V.35
 4301                                          ; AND AUTOSTART. YOU MUST MANNUALLY ANSWER
 4302                                          ; ALL QUESTIONS IF V.35.
 4303  021340  104011                          ERROR   11              ;ERROR, RING OR MRDY NOT CLEAR
 4304  021342                          2$:
 4305
 4306
 4307                                  ;****************************** TEST 41 ****************************
 4308                                  ;*CABLE TURNAROUND TEST
 4309                                  ;*CLEAR LINE UNIT LOOP, LOAD OUT DATA SILO
 4310                                  ;*VERIFY THAT ALL MODEM SIGNALS ARE SET
 4311                                  ;;**************************************************************
 4312
 4313                                  ;  TEST 41
 4314                                  ;-------------
 4315                                  ;;**************************************************************
 4316  021342  000004                  TST41:  SCOPE
 4317  021344  012737  000041  001202          MOV     #41,$TSTNM              ; LOAD THE NO. OF THIS TEST
 4318  021352  012737  021536  001442          MOV     #TST42,NEXT             ; POINT TO THE START OF NEXT TEST.
 4319                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
 4320  021360  104410                          MSTCLR                  ;MASTER CLEAR KMC11
 4321  021362  032737  020000  002050          BIT     #BIT13,STAT1    ;IS LINE UNIT M8202?
 4322  021370  001004                          BNE     .+12            ;BR IF YES (DO TEST EVEN IF NO LOOP-BACK CONN)
 4323  021372  032737  040000  002050          BIT     #BIT14,STAT1    ;IS TURNAROUND CONNECTOR ON?
 4324  021400  001456                          BEQ     1$              ;SKIP TEST IF NO
 4325  021402  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
 4326  021406  012761  000100  000004          MOV     #100,   4(R1)           ;LOAD PORT4
 4327  021414  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 4328  021416  122113                          122113                  ;CLEAR ALL MODEM SIGNALS,EXCEPT DTR
 4329  021420  104414  000002                  TIMER,  2               ;WAIT
 4330  021424  012761  000001  000004          MOV     #1,4(R1)        ;LOAD PORT4
 4331  021432  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 4332  021434  122111                          122111                  ;SET SDM
 4333  021436  004537  031530                  JSR     R5,MESLD        ;FILL OUT DATA SILO
 4334  021442  032012                          MESDAT                  ;WITH 64 CHARACTERS
 4335  021444  000100                          64.
 4336  021446  012700  000050                  MOV     #50,R0          ;PREPARE FOR DELAY
 4337  021452  005011                          CLR     (R1)            ;CLEAR LINE UNIT LOOP
 4338  021454                          2$:
 4339  021454  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 4340  021456  021264                          021264                  ;PORT4 LU13
 4341  021460  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
```

```
 4342  021464  042704  000023              BIC     #23,R4          ;CLEAR UNWANTED BITS
 4343  021470  012705  000354              MOV     #354,R5         ;PUT "EXPECTED" IN R5
 4344
 4345  021474  032737  000004  002054      BIT     #BIT2,STAT3     ; IS THIS V.35?
 4346  021502  001402                      BEQ     4$              ; NO
 4347
 4348  021504  042705  000200              BIC     #BIT7,R5        ; YES, GET RID OF RING
 4349  021510                          4$:
 4350  021510  032737  020000  002050      BIT     #BIT13,STAT1    ;IS LINE UNIT M8202?
 4351  021516  001402                      BEQ     .+6             ;BR IF NO
 4352  021520  042705  000200              BIC     #BIT7,R5        ;NO RING ON M8202
 4353  021524  120504                      CMPB    R5,R4           ;COMPARE EXPECTED AND FOUND
 4354  021526  001403                      BEQ     1$              ;BR IF OK
 4355  021530  005300                      DEC     R0              ;DEC DELAY COUNT
 4356  021532  001350                      BNE     2$              ;BR IF NOT ZERO
 4357  021534  104011                      ERROR   11              ;ERROR, ALL SIGNALS ARE NOT SET
 4358                                                              ; WARNING IF V.35, YOU MUST ANSWER ALL QUESTIONS
 4359                                                              ; MANUALLY.
 4360  021536                          1$.
 4361
 4362
 4363                                    ;***************************** TEST 42 ****************************
 4364                                    ;*TEST OF CRC OPERATION
 4365                                    ;*USING THE CRC16 POLYNOMIAL, SINGLE CLOCK THE CHARACTER
 4366                                    ;*0, VERIFY THE LSB OF THE BCC ON EACH SHIFT
 4367                                    ;*TEST TRANSMITTER FIRST THEN THE RECEIVER BCC
 4368                                    ;:**************************************************************
 4369
 4370                                    ;  TEST 42
 4371                                    ;-------------
 4372                                ;;**************************************************************
 4373  021536  000004                TST42:  SCOPE
 4374  021540  012737  000042  001202      MOV     #42,$TSTNM              ; LOAD THE NO. OF THIS TEST
 4375  021546  012737  022052  001442      MOV     #TST43,NEXT             ; POINT TO THE START OF NEXT TEST.
 4376  021554  012737  021570  001444      MOV     #64$,LOCK               ; ADDRESS FOR LOCK ON DATA.
 4377                                                          ;R1 CONTAINS BASE KMC11 ADDRESS
 4378  021562  104410                      MSTCLR                          ;MASTER CLEAR KMC11
 4379  021564  012711  004000              MOV     #BIT11,(R1)             ;SET LU LOOP
 4380  021570  004737  031572          64$:JSR     PC,CLRIO                ;CLEAR BCC REGISTERS
 4381  021574  005000                      CLR     R0                      ;START SHIFT COUNTER AT ZERO
 4382  021576  012737  120001  031226      MOV     #CRC16,XPOLY            ;LOAD POLYNOMIAL FOR SOFTWARE BCC
 4383  021604  012737  000000  021644      MOV     #0,66$                  ;LOAD CHAR FOR SOFTWARE BCC
 4384  021612  005037  021646              CLR     67$                     ;CLEAR OLD SOFTWARE BCC
 4385  021616  004737  031232              JSR     PC,BCCLD                ;LOAD OUT SILO WITH 2 SYNCS
 4386  021622  000000                      0                               ;AND THE CHARACTER 0
 4387  021624  104413  000021              DATACLK,        21              ;GET TRANSMITTER ACTIVE
 4388  021630  104413  000001          65$:DATACLK,        1               ;SHIFT BCC ONCE
 4389  021634  005200                      INC     R0                      ;BUMP SHIFT COUNT
 4390  021636  004537  031122              JSR     R5,SIMBCC               ;CALCULATE SOFTWARE BCC LSB
 4391  021642  000001                      1                               ;ONE SHIFT
 4392  021644  000000                  66$:0                               ;DATA CHARACTER
 4393  021646  000000                  67$:0                               ;OLD BCC
 4394  021650  103405                      BCS     68$                     ;BR IF SOFT BCC LSB IS SET
 4395  021652  004737  031344              JSR     PC,GETQO                ;GET HARDWARE TRANSMITTER BCC LSB
 4396  021656  103006                      BCC     69$                     ;BR IF HARD BCC LSB IS CLEAR
 4397  021660  104012                      ERROR   12                      ;ERROR, BCC LSB IS SET
```

```
4398  021662  000404                          BR      69$             ;CONTINUE
4399  021664  004737  031344          68$:    JSR     PC,GETQO        ;GET HARDWARE TRANSMITTER BCC LSB
4400  021670  103401                          BCS     69$             ;BR IF HARD BCC LSB IS SET
4401  021672  104016                          ERROR   16              ;ERROR, HARD BCC LSB IS CLEAR
4402  021674                          69$:
4403  021674  006037  021644                  ROR     66$             ;SHIFT SOFT DATA
4404  021700  013737  031230  021646          MOV     CALBCC,67$      ;LOAD OLD SOFT BCC
4405  021706  022700  000010                  CMP     #10,R0          ;DONE YET?
4406  021712  001346                          BNE     65$             ;BR IF NOT DONE
4407  021714  104405                          SCOP1                   ;SCOPE SUBTEST (SW09=1)
4408  021716  012737  021724  001444          MOV     #71$,LOCK       ;NEW SCOPE1
4409  021724  004737  031572          71$:    JSR     PC,CLRIO        ;CLEAR BCC REGISTERS
4410  021730  005000                          CLR     R0              ;START SHIFT COUNTER AT ZERO
4411  021732  012737  120001  031226          MOV     #CRC16,XPOLY    ;LOAD POLYNOMIAL FOR SOFTWARE BCC
4412  021740  012737  000000  022000          MOV     #0,73$          ;LOAD CHAR FOR SOFTWARE BCC
4413  021746  005037  022002                  CLR     74$             ;CLEAR OLD SOFTWARE BCC
4414  021752  004737  031232                  JSR     PC,BCCLD        ;LOAD OUT SILO WITH 2 SYNCS
4415  021756  000000                          0                       ;AND THE CHARACTER 0
4416  021760  104413  000032                  DATACLK,        32      ;GET RECEIVER ACTIVE
4417  021764  104413  000001          72$:    DATACLK,        1       ;SHIFT BCC ONCE
4418  021770  005200                          INC     R0              ;BUMP SHIFT COUNT
4419  021772  004537  031122                  JSR     R5,SIMBCC       ;CALCULATE SOFTWARE BCC LSB
4420  021776  000001                          1                       ;ONE SHIFT
4421  022000  000000                  73$:    0                       ;DATA CHARACTER
4422  022002  000000                  74$:    0                       ;OLD BCC
4423  022004  103405                          BCS     75$             ;BR IF SOFT BCC LSB IS SET
4424  022006  004737  031356                  JSR     PC,GETQI        ;GET HARDWARE RECEIVER BCC LSB
4425  022012  103006                          BCC     76$             ;BR IF HARD BCC LSB IS CLEAR
4426  022014  104013                          ERROR   13              ;ERROR, BCC LSB IS SET
4427  022016  000404                          BR      76$             ;CONTINUE
4428  022020  004737  031356          75$:    JSR     PC,GETQI        ;GET HARDWARE RECEIVER BCC LSB
4429  022024  103401                          BCS     76$             ;BR IF HARD BCC LSB IS SET
4430  022026  104017                          ERROR   17              ;ERROR, BCC LSB IS CLEAR
4431  022030                          76$:
4432  022030  006037  022000                  ROR     73$             ;SHIFT SOFT DATA
4433  022034  013737  031230  022002          MOV     CALBCC,74$      ;LOAD OLD SOFT BCC
4434  022042  022700  000010                  CMP     #10,R0          ;DONE YET?
4435  022046  001346                          BNE     72$             ;BR IF NOT DONE
4436  022050  104405                          SCOP1                   ;SCOPE SUBTEST (SW09=1)
4437  022052                          77$:
4438
4439
4440                                          ;***************************** TEST 43 ****************************
4441                                          ;*TEST OF CRC OPERATION
4442                                          ;*USING THE CRC16 POLYNOMIAL, SINGLE CLOCK THE CHARACTER
4443                                          ;*377, VERIFY THE LSB OF THE BCC ON EACH SHIFT
4444                                          ;*TEST TRANSMITTER FIRST THEN THE RECEIVER BCC
4445                                          ;;**********************************************************************
4446
4447                                          ;  TEST 43
4448                                          ;-------------
4449                                  ;;**********************************************************************
4450  022052  000004                  TST43:  SCOPE
4451  022054  012737  000043  001202          MOV     #43,$TSTNM              ; LOAD THE NO. OF THIS TEST
4452  022062  012737  022366  001442          MOV     #TST44,NEXT             ; POINT TO THE START OF NEXT TEST.
4453  022070  012737  022104  001444          MOV     #64$,LOCK               ; ADDRESS FOR LOCK ON DATA.
```

```
                                                        ;R1 CONTAINS BASE KMC11 ADDRESS
022076  104410                          MSTCLR          ;MASTER CLEAR KMC11
022100  012711  004000                  MOV     #BIT11,(R1)     ;SET LU LOOP
022104  004737  031572          64$:    JSR     PC,CLRIO        ;CLEAR BCC REGISTERS
022110  005000                          CLR     R0              ;START SHIFT COUNTER AT ZERO
022112  012737  120001  031226          MOV     #CRC16,XPOLY    ;LOAD POLYNOMIAL FOR SOFTWARE BCC
022120  012737  000377  022160          MOV     #377,66$;       ;LOAD CHAR FOR SOFTWARE BCC
022126  005037  022162                  CLR     67$             ;CLEAR OLD SOFTWARE BCC
022132  004737  031232                  JSR     PC,BCCLD        ;LOAD OUT SILO WITH 2 SYNCS
022136  000377                          377                     ;AND THE CHARACTER 377
022140  104413  000021                  DATACLK,        21      ;GET TRANSMITTER ACTIVE
022144  104413  000001          65$:    DATACLK,        1       ;SHIFT BCC ONCE
022150  005200                          INC     R0              ;BUMP SHIFT COUNT
022152  004537  031122                  JSR     R5,SIMBCC       ;CALCULATE SOFTWARE BCC LSB
022156  000001                          1                       ;ONE SHIFT
022160  000000                  66$:    0                       ;DATA CHARACTER
022162  000000                  67$:    0                       ;OLD BCC
022164  103405                          BCS     68$             ;BR IF SOFT BCC LSB IS SET
022166  004737  031344                  JSR     PC,GETQO        ;GET HARDWARE TRANSMITTER BCC LSB
022172  103006                          BCC     69$             ;BR IF HARD BCC LSB IS CLEAR
022174  104012                          ERROR   12              ;ERROR, BCC LSB IS SET
022176  000404                          BR      69$             ;CONTINUE
022200  004737  031344          68$:    JSR     PC,GETQO        ;GET HARDWARE TRANSMITTER BCC LSB
022204  103401                          BCS     69$             ;BR IF HARD BCC LSB IS SET
022206  104016                          ERROR   16              ;ERROR, HARD BCC LSB IS CLEAR
022210                          69$:
022210  006037  022160                  ROR     66$             ;SHIFT SOFT DATA
022214  013737  031230  022162          MOV     CALBCC,67$      ;LOAD OLD SOFT BCC
022222  022700  000010                  CMP     #10,R0          ;DONE YET?
022226  001346                          BNE     65$             ;BR IF NOT DONE
022230  104405                          SCOP1                   ;SCOPE SUBTEST (SW09=1)
022232  012737  022240  001444          MOV     #71$,LOCK       ;NEW SCOPE1
022240  004737  031572          71$:    JSR     PC,CLRIO        ;CLEAR BCC REGISTERS
022244  005000                          CLR     R0              ;START SHIFT COUNTER AT ZERO
022246  012737  120001  031226          MOV     #CRC16,XPOLY    ;LOAD POLYNOMIAL FOR SOFTWARE BCC
022254  012737  000377  022314          MOV     #377,73$;       ;LOAD CHAR FOR SOFTWARE BCC
022262  005037  022316                  CLR     74$             ;CLEAR OLD SOFTWARE BCC
022266  004737  031232                  JSR     PC,BCCLD        ;LOAD OUT SILO WITH 2 SYNCS
022272  000377                          377                     ;AND THE CHARACTER 377
022274  104413  000032                  DATACLK,        32      ;GET RECEIVER ACTIVE
022300  104413  000001          72$:    DATACLK,        1       ;SHIFT BCC ONCE
022304  005200                          INC     R0              ;BUMP SHIFT COUNT
022306  004537  031122                  JSR     R5,SIMBCC       ;CALCULATE SOFTWARE BCC LSB
022312  000001                          1                       ;ONE SHIFT
022314  000000                  73$:    0                       ;DATA CHARACTER
022316  000000                  74$:    0                       ;OLD BCC
022320  103405                          BCS     75$             ;BR IF SOFT BCC LSB IS SET
022322  004737  031356                  JSR     PC,GETQI        ;GET HARDWARE RECEIVER BCC LSB
022326  103006                          BCC     76$             ;BR IF HARD BCC LSB IS CLEAR
022330  104013                          ERROR   13              ;ERROR, BCC LSB IS SET
022332  000404                          BR      76$             ;CONTINUE
022334  004737  031356          75$:    JSR     PC,GETQI        ;GET HARDWARE RECEIVER BCC LSB
022340  103401                          BCS     76$             ;BR IF HARD BCC LSB IS SET
022342  104017                          ERROR   17              ;ERROR, BCC LSB IS CLEAR
022344                          76$:
022344  006037  022314                  ROR     73$             ;SHIFT SOFT DATA
```

```
 4510  022350  013737  031230  022316          MOV     CALBCC,74$      ;LOAD OLD SOFT BCC
 4511  022356  022700  000010                  CMP     #10,R0          ;DONE YET?
 4512  022362  001346                          BNE     72$             ;BR IF NOT DONE
 4513  022364  104405                          SCOP1                   ;SCOPE SUBTEST (SW09=1)
 4514  022366                          77$:
 4515
 4516
 4517                                          ;*************************** TEST 44 ***************************
 4518                                          ;*TEST OF CRC OPERATION
 4519                                          ;*USING THE CRC16 POLYNOMIAL, SINGLE CLOCK THE CHARACTER
 4520                                          ;*125, VERIFY THE LSB OF THE BCC ON EACH SHIFT
 4521                                          ;*TEST TRANSMITTER FIRST THEN THE RECEIVER BCC
 4522                                          ;;*************************************************************************
 4523
 4524                                          ;  TEST 44
 4525                                          ;-------------
 4526                                  ;;*************************************************************
 4527  022366  000004                  TST44:  SCOPE
 4528  022370  012737  000044  001202          MOV     #44,$TSTNM              ; LOAD THE NO. OF THIS TEST
 4529  022376  012737  022702  001442          MOV     #TST45,NEXT             ; POINT TO THE START OF NEXT TEST.
 4530  022404  012737  022420  001444          MOV     #64$,LOCK               ; ADDRESS FOR LOCK ON DATA.
 4531                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
 4532  022412  104410                          MSTCLR                  ;MASTER CLEAR KMC11
 4533  022414  012711  004000                  MOV     #BIT11,(R1)     ;SET LU LOOP
 4534  022420  004737  031572          64$:    JSR     PC,CLRIO        ;CLEAR BCC REGISTERS
 4535  022424  005000                          CLR     R0              ;START SHIFT COUNTER AT ZERO
 4536  022426  012737  120001  031226          MOV     #CRC16,XPOLY    ;LOAD POLYNOMIAL FOR SOFTWARE BCC
 4537  022434  012737  000125  022474          MOV     #125,66$;       ;LOAD CHAR FOR SOFTWARE BCC
 4538  022442  005037  022476                  CLR     67$             ;CLEAR OLD SOFTWARE BCC
 4539  022446  004737  031232                  JSR     PC,BCCLD        ;LOAD OUT SILO WITH 2 SYNCS
 4540  022452  000125                          125                     ;AND THE CHARACTER 125
 4541  022454  104413  000021                  DATACLK,        21      ;GET TRANSMITTER ACTIVE
 4542  022460  104413  000001          65$:    DATACLK,        1       ;SHIFT BCC ONCE
 4543  022464  005200                          INC     R0              ;BUMP SHIFT COUNT
 4544  022466  004537  031122                  JSR     R5,SIMBCC       ;CALCULATE SOFTWARE BCC LSB
 4545  022472  000001                          1                       ;ONE SHIFT
 4546  022474  000000          66$:    0                               ;DATA CHARACTER
 4547  022476  000000          67$:    0                               ;OLD BCC
 4548  022500  103405                          BCS     68$             ;BR IF SOFT BCC LSB IS SET
 4549  022502  004737  031344                  JSR     PC,GETQO        ;GET HARDWARE TRANSMITTER BCC LSB
 4550  022506  103006                          BCC     69$             ;BR IF HARD BCC LSB IS CLEAR
 4551  022510  104012                          ERROR   12              ;ERROR, BCC LSB IS SET
 4552  022512  000404                          BR      69$             ;CONTINUE
 4553  022514  004737  031344          68$:    JSR     PC,GETQO        ;GET HARDWARE TRANSMITTER BCC LSB
 4554  022520  103401                          BCS     69$             ;BR IF HARD BCC LSB IS SET
 4555  022522  104016                          ERROR   16              ;ERROR, HARD BCC LSB IS CLEAR
 4556  022524                          69$:
 4557  022524  006037  022474                  ROR     66$             ;SHIFT SOFT DATA
 4558  022530  013737  031230  022476          MOV     CALBCC,67$      ;LOAD OLD SOFT BCC
 4559  022536  022700  000010                  CMP     #10,R0          ;DONE YET?
 4560  022542  001346                          BNE     65$             ;BR IF NOT DONE
 4561  022544  104405                          SCOP1                   ;SCOPE SUBTEST (SW09=1)
 4562  022546  012737  022554  001444          MOV     #71$,LOCK       ;NEW SCOPE1
 4563  022554  004737  031572          71$:    JSR     PC,CLRIO        ;CLEAR BCC REGISTERS
 4564  022560  005000                          CLR     R0              ;START SHIFT COUNTER AT ZERO
 4565  022562  012737  120001  031226          MOV     #CRC16,XPOLY    ;LOAD POLYNOMIAL FOR SOFTWARE BCC
```

```
4566  022570  012737  000125  022630          MOV     #125,73$;       ;LOAD CHAR FOR SOFTWARE BCC
4567  022576  005037  022632                  CLR     74$             ;CLEAR OLD SOFTWARE BCC
4568  022602  004737  031232                  JSR     PC,BCCLD        ;LOAD OUT SILO WITH 2 SYNCS
4569  022606  000125                          125                     ;AND THE CHARACTER 125
4570  022610  104413  000032                  DATACLK,        32      ;GET RECEIVER ACTIVE
4571  022614  104413  000001          72$:    DATACLK,        1       ;SHIFT BCC ONCE
4572  022620  005200                          INC     R0              ;BUMP SHIFT COUNT
4573  022622  004537  031122                  JSR     R5,SIMBCC       ;CALCULATE SOFTWARE BCC LSB
4574  022626  000001                          1                       ;ONE SHIFT
4575  022630  000000          73$:    0                               ;DATA CHARACTER
4576  022632  000000          74$:    0                               ;OLD BCC
4577  022634  103405                          BCS     75$             ;BR IF SOFT BCC LSB IS SET
4578  022636  004737  031356                  JSR     PC,GETQI        ;GET HARDWARE RECEIVER BCC LSB
4579  022642  103006                          BCC     76$             ;BR IF HARD BCC LSB IS CLEAR
4580  022644  104013                          ERROR   13              ;ERROR, BCC LSB IS SET
4581  022646  000404                          BR      76$             ;CONTINUE
4582  022650  004737  031356          75$:    JSR     PC,GETQI        ;GET HARDWARE RECEIVER BCC LSB
4583  022654  103401                          BCS     76$             ;BR IF HARD BCC LSB IS SET
4584  022656  104017                          ERROR   17              ;ERROR, BCC LSB IS CLEAR
4585  022660                          76$:
4586  022660  006037  022630                  ROR     73$             ;SHIFT SOFT DATA
4587  022664  013737  031230  022632          MOV     CALBCC,74$      ;LOAD OLD SOFT BCC
4588  022672  022700  000010                  CMP     #10,R0          ;DONE YET?
4589  022676  001346                          BNE     72$             ;BR IF NOT DONE
4590  022700  104405                          SCOP1                   ;SCOPE SUBTEST (SW09=1)
4591  022702                          77$:
4592
4593
4594                                          ;***************************** TEST 45 *****************************
4595                                          ;*TEST OF CRC OPERATION
4596                                          ;*USING THE CRC16 POLYNOMIAL, SINGLE CLOCK THE CHARACTER
4597                                          ;*252, VERIFY THE LSB OF THE BCC ON EACH SHIFT
4598                                          ;*TEST TRANSMITTER FIRST THEN THE RECEIVER BCC
4599                                          ;:*************************************************************
4600
4601                                          ;  TEST 45
4602                                          ;-------------
4603                                  ;;*************************************************************
4604  022702  000004          TST45:  SCOPE
4605  022704  012737  000045  001202          MOV     #45,$TSTNM              ; LOAD THE NO. OF THIS TEST
4606  022712  012737  023216  001442          MOV     #TST46,NEXT             ; POINT TO THE START OF NEXT TEST.
4607  022720  012737  022734  001444          MOV     #64$,LOCK               ; ADDRESS FOR LOCK ON DATA.
4608                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
4609  022726  104410                          MSTCLR                  ;MASTER CLEAR KMC11
4610  022730  012711  004000                  MOV     #BIT11,(R1)     ;SET LU LOOP
4611  022734  004737  031572          64$:    JSR     PC,CLRIO        ;CLEAR BCC REGISTERS
4612  022740  005000                          CLR     R0              ;START SHIFT COUNTER AT ZERO
4613  022742  012737  120001  031226          MOV     #CRC16,XPOLY    ;LOAD POLYNOMIAL FOR SOFTWARE BCC
4614  022750  012737  000252  023010          MOV     #252,66$;       ;LOAD CHAR FOR SOFTWARE BCC
4615  022756  005037  023012                  CLR     67$             ;CLEAR OLD SOFTWARE BCC
4616  022762  004737  031232                  JSR     PC,BCCLD        ;LOAD OUT SILO WITH 2 SYNCS
4617  022766  000252                          252                     ;AND THE CHARACTER 252
4618  022770  104413  000021                  DATACLK,        21      ;GET TRANSMITTER ACTIVE
4619  022774  104413  000001          65$:    DATACLK,        1       ;SHIFT BCC ONCE
4620  023000  005200                          INC     R0              ;BUMP SHIFT COUNT
4621  023002  004537  031122                  JSR     R5,SIMBCC       ;CALCULATE SOFTWARE BCC LSB
```

```
4622  023006  000001                          1                       ;ONE SHIFT
4623  023010  000000                 66$:     0                       ;DATA CHARACTER
4624  023012  000000                 67$:     0                       ;OLD BCC
4625  023014  103405                          BCS     68$             ;BR IF SOFT BCC LSB IS SET
4626  023016  004737  031344                  JSR     PC,GETQO        ;GET HARDWARE TRANSMITTER BCC LSB
4627  023022  103006                          BCC     69$             ;BR IF HARD BCC LSB IS CLEAR
4628  023024  104012                          ERROR   12              ;ERROR, BCC LSB IS SET
4629  023026  000404                          BR      69$             ;CONTINUE
4630  023030  004737  031344          68$:    JSR     PC,GETQO        ;GET HARDWARE TRANSMITTER BCC LSB
4631  023034  103401                          BCS     69$             ;BR IF HARD BCC LSB IS SET
4632  023036  104016                          ERROR   16              ;ERROR, HARD BCC LSB IS CLEAR
4633  023040                          69$:
4634  023040  006037  023010                  ROR     66$             ;SHIFT SOFT DATA
4635  023044  013737  031230  023012          MOV     CALBCC,67$      ;LOAD OLD SOFT BCC
4636  023052  022700  000010                  CMP     #10,R0          ;DONE YET?
4637  023056  001346                          BNE     65$             ;BR IF NOT DONE
4638  023060  104405                          SCOP1                   ;SCOPE SUBTEST (SW09=1)
4639  023062  012737  023070  001444          MOV     #71$,LOCK       ;NEW SCOPE1
4640  023070  004737  031572          71$:    JSR     PC,CLRIO        ;CLEAR BCC REGISTERS
4641  023074  005000                          CLR     R0              ;START SHIFT COUNTER AT ZERO
4642  023076  012737  120001  031226          MOV     #CRC16,XPOLY    ;LOAD POLYNOMIAL FOR SOFTWARE BCC
4643  023104  012737  000252  023144          MOV     #252,73$;       ;LOAD CHAR FOR SOFTWARE BCC
4644  023112  005037  023146                  CLR     74$             ;CLEAR OLD SOFTWARE BCC
4645  023116  004737  031232                  JSR     PC,BCCLD        ;LOAD OUT SILO WITH 2 SYNCS
4646  023122  000252                          252                     ;AND THE CHARACTER 252
4647  023124  104413  000032                  DATACLK,        32      ;GET RECEIVER ACTIVE
4648  023130  104413  000001          72$:    DATACLK,        1       ;SHIFT BCC ONCE
4649  023134  005200                          INC     R0              ;BUMP SHIFT COUNT
4650  023136  004537  031122                  JSR     R5,SIMBCC       ;CALCULATE SOFTWARE BCC LSB
4651  023142  000001                          1                       ;ONE SHIFT
4652  023144  000000                 73$:     0                       ;DATA CHARACTER
4653  023146  000000                 74$:     0                       ;OLD BCC
4654  023150  103405                          BCS     75$             ;BR IF SOFT BCC LSB IS SET
4655  023152  004737  031356                  JSR     PC,GETQI        ;GET HARDWARE RECEIVER BCC LSB
4656  023156  103006                          BCC     76$             ;BR IF HARD BCC LSB IS CLEAR
4657  023160  104013                          ERROR   13              ;ERROR, BCC LSB IS SET
4658  023162  000404                          BR      76$             ;CONTINUE
4659  023164  004737  031356          75$:    JSR     PC,GETQI        ;GET HARDWARE RECEIVER BCC LSB
4660  023170  103401                          BCS     76$             ;BR IF HARD BCC LSB IS SET
4661  023172  104017                          ERROR   17              ;ERROR, BCC LSB IS CLEAR
4662  023174                          76$:
4663  023174  006037  023144                  ROR     73$             ;SHIFT SOFT DATA
4664  023200  013737  031230  023146          MOV     CALBCC,74$      ;LOAD OLD SOFT BCC
4665  023206  022700  000010                  CMP     #10,R0          ;DONE YET?
4666  023212  001346                          BNE     72$             ;BR IF NOT DONE
4667  023214  104405                          SCOP1                   ;SCOPE SUBTEST (SW09=1)
4668  023216                          77$:
4669
4670
4671                                          ;***************************** TEST 46 ****************************
4672                                          ;*TRANSMITTER CRC TEST
4673                                          ;*USING THE CRC16 POLYNOMINAL, SINGLE CLOCK A BINARY
4674                                          ;*COUNT PATTERN, VERIFY THE LSB OF THE TRANSMITTER BCC ON EACH SHIFT
4675                                          ;:**********************************************************************
4676
4677                                          ;  TEST 46
```

```
                                        ;--------------
                                        ;;**************************************************************
023216  000004                  TST46:  SCOPE
023220  012737  000046  001202          MOV     #46,$TSTNM              ; LOAD THE NO. OF THIS TEST
023226  012737  023454  001442          MOV     #TST47,NEXT             ; POINT TO THE START OF NEXT TEST.
                                                                ;R1 CONTAINS BASE KMC11 ADDRESS
023234  104410                          MSTCLR                  ;MASTER CLEAR KMC11
023236  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
023242  005003                          CLR     R3              ;ZERO BIT COUNT
023244  005004                          CLR     R4              ;R4 CONTAINS CHAR TO BE LOADED IN SILO
023246  005005                          CLR     R5              ;R5 CONTAINS CHAR CURRENTLY BEING SHIFTED OUT
023250  005037  023352                  CLR     4$              ;CLEAR SOFT BCC
023254  012737  120001  031226          MOV     #CRC16,XPOLY    ;LOAD POLYNOMINAL
023262  004737  031374                  JSR     PC,SYNLD        ;LOAD SILO WITH 2 SYNCS, SOM SET
023266  010461  000004                  MOV     R4,4(R1)        ;PORT4 CHAR
023272  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023274  122110                          122110                  ;LOAD OUT DATA
023276  005204                          INC     R4              ;INCREMENT TO NEXT CHARACTER
023300  010461  000004                  MOV     R4,4(R1)        ;PORT4 CHAR
023304  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023306  122110                          122110                  ;LOAD OUT DATA
023310  005204                          INC     R4              ;INCREMENT TO NEXT CHARACTER
023312  010461  000004                  MOV     R4,4(R1)        ;PORT4 CHAR
023316  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023320  122110                          122110                  ;LOAD OUT DATA
023322  004737  030260                  JSR     PC,OCOR         ;WAIT FOR OCOR
023326  104413  000021                  DATACLK,21              ;CLOCK DATA
023332  010537  023350          1$:     MOV     R5,3$           ;LOAD CHAR FOR SOFT CRC
023336  104413  000001          2$:     DATACLK,1               ;SHIFT BCC ONCE
023342  004537  031122                  JSR     R5,SIMBCC       ;CALCULATE SOFT BCC
023346  000001                          1                       ;SOFT SHIFT COUNT
023350  000000          3$:     0                               ;SOFT CHARACTER
023352  000000          4$:     0                               ;OLD SOFT BCC
023354  103405                          BCS     5$              ;BR IF SOFT BCC LSB IS SET
023356  004737  031344                  JSR     PC,GETQO                ;GET HARDWARE TRANSMITTER BCC LSB
023362  103006                          BCC     6$              ;BR IF OK (CLEARED)
023364  104020                          ERROR   20              ;ERROR, BCC LSB WAS SET
023366  000404                          BR      6$              ;CONTINUE WITH TEST
023370  004737  031344          5$:     JSR     PC,GETQO                ;GET HARDWARE TRANSMITTER BCC LSB
023374  103401                          BCS     6$              ;BR IF OK (SET)
023376  104021                          ERROR   21              ;ERROR, BCC LSB WAS CLEAR

023400                          6$:
023400  006037  023350                  ROR     3$              ;SHIFT SOFT DATA
023404  013737  031230  023352          MOV     CALBCC,4$       ;LOAD OLD SOFT BCC
023412  005203                          INC     R3              ;INCREMENT BIT COUNTER
023414  022703  000010                  CMP     #10,R3          ;DONE A FULL CHARACTER YET?
023420  001346                          BNE     2$              ;BR IF NO
023422  005003                          CLR     R3              ;RESTART BIT COUNTER
023424  005204                          INC     R4              ;INCREMENT DATA FOR SILO
023426  022704  000400                  CMP     #400,R4         ;DONE BINARY COUNT YET?
023432  003404                          BLE     9$              ;BR IF YES
023434  010461  000004                  MOV     R4,4(R1)        ;PORT4 DATA
023440  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
023442  122110                          122110                  ;LOAD OUT DATA
023444  005205                  9$:     INC     R5              ;INCREMENT DATA
```

```
 4734  023446  022705  000400                  CMP     #400,R5         ;DONE BINARY PATTERN YET?
 4735  023452  001327                          BNE     1$              ;BR IF NO
 4736  023454                          7$:
 4737
 4738
 4739                                          ;***************************** TEST 47 ****************************
 4740                                          ;*RECEIVER CRC TEST
 4741                                          ;*USING THE CRC16 POLYNOMINAL, SINGLE CLOCK A BINARY
 4742                                          ;*COUNT PATTERN, VERIFY THE LSB OF THE RECEIVER BCC ON EACH SHIFT
 4743                                          ;;*************************************************************
 4744
 4745                                          ;  TEST 47
 4746                                          ;-------------
 4747                                  ;;*************************************************************
 4748  023454  000004                  TST47:  SCOPE
 4749  023456  012737  000047  001202          MOV     #47,$TSTNM              ; LOAD THE NO. OF THIS TEST
 4750  023464  012737  023712  001442          MOV     #TST50,NEXT             ; POINT TO THE START OF NEXT TEST.
 4751                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
 4752  023472  104410                          MSTCLR                  ;MASTER CLEAR KMC11
 4753  023474  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
 4754  023500  005003                          CLR     R3              ;ZERO BIT COUNT
 4755  023502  005004                          CLR     R4              ;R4 CONTAINS CHAR TO BE LOADED IN SILO
 4756  023504  005005                          CLR     R5              ;R5 CONTAINS CHAR CURRENTLY BEING SHIFTED OUT
 4757  023506  005037  023610                  CLR     4$              ;CLEAR SOFT BCC
 4758  023512  012737  120001  031226          MOV     #CRC16,XPOLY    ;LOAD POLYNOMINAL
 4759  023520  004737  031374                  JSR     PC,SYNLD        ;LOAD SILO WITH 2 SYNCS, SOM SET
 4760  023524  010461  000004                  MOV     R4,4(R1)        ;PORT4 CHAR
 4761  023530  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 4762  023532  122110                          122110                  ;LOAD OUT DATA
 4763  023534  005204                          INC     R4              ;INCREMENT TO NEXT CHARACTER
 4764  023536  010461  000004                  MOV     R4,4(R1)        ;PORT4 CHAR
 4765  023542  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 4766  023544  122110                          122110                  ;LOAD OUT DATA
 4767  023546  005204                          INC     R4              ;INCREMENT TO NEXT CHARACTER
 4768  023550  010461  000004                  MOV     R4,4(R1)        ;PORT4 CHAR
 4769  023554  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 4770  023556  122110                          122110                  ;LOAD OUT DATA
 4771  023560  004737  030260                  JSR     PC,OCOR         ;WAIT FOR OCOR
 4772  023564  104413  000032                  DATACLK,32              ;CLOCK DATA
 4773  023570  010537  023606          1$:     MOV     R5,3$           ;LOAD CHAR FOR SOFT CRC
 4774  023574  104413  000001          2$:     DATACLK,1               ;SHIFT BCC ONCE
 4775  023600  004537  031122                  JSR     R5,SIMBCC       ;CALCULATE SOFT BCC
 4776  023604  000001                          1                       ;SOFT SHIFT COUNT
 4777  023606  000000                  3$:     0                       ;SOFT CHARACTER
 4778  023610  000000                  4$:     0                       ;OLD SOFT BCC
 4779  023612  103405                          BCS     5$              ;BR IF SOFT BCC LSB IS SET
 4780  023614  004737  031356                  JSR     PC,GETQI                ;GET HARDWARE RECEIVER BCC LSB
 4781  023620  103006                          BCC     6$              ;BR IF OK (CLEARED)
 4782  023622  104022                          ERROR   22              ;ERROR, BCC LSB WAS SET
 4783  023624  000404                          BR      6$              ;CONTINUE WITH TEST
 4784  023626  004737  031356          5$:     JSR     PC,GETQI                ;GET HARDWARE RECEIVER BCC LSB
 4785  023632  103401                          BCS     6$              ;BR IF OK (SET)
 4786  023634  104023                          ERROR   23              ;ERROR, BCC LSB WAS CLEAR
 4787
 4788  023636                          6$:
 4789  023636  006037  023606                  ROR     3$              ;SHIFT SOFT DATA
```

```
 4790  023642  013737  031230  023610          MOV     CALBCC,4$       ;LOAD OLD SOFT BCC
 4791  023650  005203                          INC     R3              ;INCREMENT BIT COUNTER
 4792  023652  022703  000010                  CMP     #10,R3          ;DONE A FULL CHARACTER YET?
 4793  023656  001346                          BNE     2$              ;BR IF NO
 4794  023660  005003                          CLR     R3              ;RESTART BIT COUNTER
 4795  023662  005204                          INC     R4              ;INCREMENT DATA FOR SILO
 4796  023664  022704  000400                  CMP     #400,R4         ;DONE BINARY COUNT YET?
 4797  023670  003404                          BLE     9$              ;BR IF YES
 4798  023672  010461  000004                  MOV     R4,4(R1)        ;PORT4 DATA
 4799  023676  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 4800  023700  122110                          122110                  ;LOAD OUT DATA
 4801  023702  005205                  9$:     INC     R5              ;INCREMENT DATA
 4802  023704  022705  000400                  CMP     #400,R5         ;DONE BINARY PATTERN YET?
 4803  023710  001327                          BNE     1$              ;BR IF NO
 4804  023712                          7$:
 4805
 4806
 4807                                          ;***************************** TEST 50 ***************************
 4808                                          ;*TRANSMITTER DDCMP CRC TEST
 4809                                          ;*THIS TEST TRANSMITS A FOUR CHARACTER MESSAGE WITH CRC
 4810                                          ;*BOTH DATA AND THE BCC ARE VERIFIED IN THE BIT
 4811                                          ;*WINDOW. THE FOUR CHARACTERS ARE 0,125,252,377
 4812                                          ;*THE TRANSMITTER IS CHECKED FOR GOING TO A MARK STATE AFTER THE BCC
 4813                                          ;;*************************************************************************
 4814
 4815                                          ;  TEST 50
 4816                                          ;-------------
 4817                                  ;;*************************************************************************
 4818  023712  000004                  TST50:  SCOPE
 4819  023714  012737  000050  001202          MOV     #50,$TSTNM              ; LOAD THE NO. OF THIS TEST
 4820  023722  012737  024244  001442          MOV     #TST51,NEXT             ; POINT TO THE START OF NEXT TEST.
 4821                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
 4822  023730  104410                          MSTCLR                  ;MASTER CLEAR KMC11
 4823
 4824                                          ;LOAD OUT DATA SILO
 4825
 4826  023732  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
 4827  023736  012704  032012                  MOV     #MESDAT,R4      ;LOAD POINTER TO DATA
 4828  023742  005037  024036                  CLR     10$             ;CLEAR SOFT BCC
 4829  023746  012700  000004                  MOV     #4,R0           ;LOAD CHARACTER COUNT
 4830  023752  004737  031374                  JSR     PC,SYNLD        ;LOAD 2 SYNCS IN OUT SILO
 4831  023756  004737  030412                  JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
 4832  023762  004537  031530                  JSR     R5,MESLD        ;LOAD SILO WITH 4 CHAR MESS
 4833  023766  03201.                          MESDAT                  ;ADDRESS OF MESSAGE
 4834  023770  000004                          4                       ;NUMBER OF CHARACTERS
 4835  023772  004737  031504                  JSR     PC,EOM          ;LOAD GARBAGE CHARACTER, WITH EOM SET
 4836  023776  004737  030260                  JSR     PC,OCOR         ;WAIT FOR OCOR
 4837  024002  005003                          CLR     R3              ;CLEAR BIT COUNTER
 4838  024004  104413  000022                  DATACLK,22              ;CLOCK DATA
 4839  024010  112405                  12$:    MOVB    (R4)+,R5        ;LOAD R5 WITH CHAR
 4840  024012  010502                          MOV     R5,R2           ;LOAD R2 WITH CHAR
 4841
 4842                                          ;CHECK FIRST FOUR CHARACTER MESSAGE
 4843                                          ;IN THE BIT WINDOW (0,125,252,377)
 4844
 4845  024014  012737  120001  031226          MOV     #CRC16,XPOLY    ;LOAD POLYNOMIAL
```

```
 4846  024022  010537  024034                    MOV     R5,67$          ;LOAD SOFT CHAR FOR BCC
 4847  024026  004537  031122                    JSR     R5,SIMBCC       ;CALCULATE SOFT BCC
 4848  024032  000010                            10                      ;SHIFT COUNT
 4849  024034  000000                  67$:      0                       ;CHARACTER
 4850  024036  000000                  10$:      0                       ;OLD BCC
 4851  024040  013737  031230  024036            MOV     CALBCC,10$      ;LOAD SOFT BCC FOR NEXT SHIFT
 4852  024046  104413  000001            64$:    DATACLK,        1       ;SHIFT DATA IN TO BIT WINDOW
 4853  024052  106002                            RORB    R2              ;SHIFT SOFT DATA
 4854  024054  103005                            BCC     65$             ;BR IF A SPACE
 4855  024056  004737  030226                    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
 4856  024062  103406                            BCS     66$             ;BR IF OK (MARK)
 4857  024064  104006                            ERROR   6               ;ERROR, BIT WINDOW WAS A SPACE
 4858  024066  000404                            BR      66$             ;CONTINUE
 4859  024070  004737  030226            65$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
 4860  024074  103001                            BCC     66$             ;BR IF OK (SPACE)
 4861  024076  104006                            ERROR   6               ;ERROR, BIT WINDOW WAS A MARK
 4862  024100                            66$:
 4863  024100  005203                            INC     R3              ;BUMP BIT COUNTER
 4864  024102  022703  000010                    CMP     #10,R3          ;DONE FULL 8 BITS YET
 4865  024106  001357                            BNE     64$             ;BR IF NO
 4866  024110  005003                            CLR     R3              ;CLEAR BIT COUNTER
 4867  024112  005300                            DEC     R0              ;DEC CHARACTER COUNT
 4868  024114  001335                            BNE     12$             ;BR IF NOT DONE YET
 4869
 4870                                            ;CHECK BCC FOR PRECEDING MESSAGE IN THE BIT WINDOW
 4871
 4872  024116  013700  031230                    MOV     CALBCC,R0       ;PUT BCC IN R0
 4873  024122  104413  000001            68$:    DATACLK,1               ;SHIFT HARDWARE BCC
 4874  024126  006000                            ROR     R0              ;SHIFT SOFT BCC
 4875  024130  103005                            BCC     69$             ;BR IF CARRY CLEAR
 4876  024132  004737  030224                    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
 4877  024136  103406                            BCS     70$             ;BR IF OK (MARK)
 4878  024140  104014                            ERROR   14              ;ERROR, CRC WRONG (SPACE)
 4879  024142  000404                            BR      70$             ;CONTINUE
 4880  024144  004737  030226            69$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
 4881  024150  103001                            BCC     70$             ;BR IF OK (SPACE)
 4882  024152  104014                            ERROR   14              ;ERROR, CRC WRONG (MARK)
 4883  024154                            70$:
 4884  024154  005203                            INC     R3              ;BUMP BIT COUNTER
 4885  024156  022703  000020                    CMP     #20,R3          ;FINISHED BCC YET?
 4886  024162  001357                            BNE     68$             ;BR IF NO
 4887  024164  005003                            CLR     R3              ;CLEAR BIT COUNTER
 4888
 4889                                            ;CHECK TO SEE IF TRANSMITTER IS MARKING
 4890
 4891  024166  104413  000001            2$:     DATACLK,        1       ;CLOCK TRANSMITTER
 4892  024172  004737  030226                    JSR     PC,GETSI        ;LOOK AT WINDOW
 4893  024176  103401                            BCS     3$              ;IT SHOULD BE MARKING
 4894  024200  104024                            ERROR   24              ;ERROR, BIT WAS A SPACE
 4895  024202  005203                    3$:     INC     R3              ;BUMP BIT COUNTER
 4896  024204  022703  000007                    CMP     #7,R3           ;DONE YET
 4897  024210  001366                            BNE     2$              ;BR IF NO
 4898  024212  104413  000010                    DATACLK,        10      ;GIVE ENOUGH TICKS TO CLEAR OUT ACTIVE
 4899  024216  005003                            CLR     R3              ;CLEAR BIT COUNTER
 4900  024220  104413  000001            4$:     DATACLK,        1       ;SHIFT OUT NEXT BIT
 4901  024224  004737  030226                    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
```

```
                                        BCS     .+4             ;BR IF IT IS A MARK
                                        ERROR   24              ;ERROR, TRANSMITTER IS NOT MARKING
                                        INC     R3              ;INC BIT COUNT
                                        CMP     #20,R3          ;DONE YET?
                                        BNE     4$              ;BR IF NO
                                5$:

                                        ;************************** TEST 51 **************************
                                        ;*RECEIVER DDCMP CRC TEST
                                        ;*THIS TEST CLOCKS A FOUR CHARACTER MESSAGE WITH BCC
                                        ;*AND VERIFYS CORRECT DATA RECEPTION AND BCC MATCH
                                        ;*THE FOUR CHARACTER MESSAGE IS 0,125,252,377
                                        ;;*************************************************************

                                        ;  TEST 51
                                        ;-------------
                                ;;*************************************************************
000004                          TST51:  SCOPE
000051  001202                          MOV     #51,$TSTNM              ; LOAD THE NO. OF THIS TEST
024446  001442                          MOV     #TST52,NEXT             ; POINT TO THE START OF NEXT TEST.
                                                                ;R1 CONTAINS BASE KMC11 ADDRESS
104410                                  MSTCLR                  ;MASTER CLEAR KMC11
004000                                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
032012                                  MOV     #MESDAT,R2      ;LOAD POINTER TO DATA
000004                                  MOV     #4,R0           ;LOAD CHARACTER COUNT
031374                                  JSR     PC,SYNLD        ;LOAD 2 SYNCS IN OUT SILO
030412                                  JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
031530                                  JSR     R5,MESLD        ;LOAD SILO WITH 4 CHAR MESS
032012                                  MESDAT                  ;ADDRESS OF MESSAGE
000004                                  4                       ;NUMBER OF CHARACTERS
031504                                  JSR     PC,EOM          ;LOAD GARBAGE CHARACTER, WITH EOM SET
030260                                  JSR     PC,OCOR         ;WAIT FOR OCOR
104413  000114                          DATACLK,114             ;CLOCK DATA
031066                          3$:     JSR     PC,INRDY        ;WAIT FOR INRDY
104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021204                                  021204                  ;GET IN DATA
000004                                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
112205                                  MOVB    (R2)+,R5        ;PUT "EXPECTED" IN R5
120504                                  CMPB    R5,R4           ;COMPARE RECEIVED DATA
001401                                  BEQ     1$              ;BR IF OK
104010                                  ERROR   10              ;DATA ERROR
005300                          1$:     DEC     R0              ;DEC CHARACTER COUNT
001364                                  BNE     3$              ;BR IF NOT DONE YET

                                ;CHECK TO SEE THAT IN BCC MATCH IS SET

031066                                  JSR     PC,INRDY        ;WAIT FOR INRDY
104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021204                                  021204                  ;GET FIRST HALF OF CRC
000004  001302                          MOVB    4(R1),$TMP2     ;PUT IN $TMP2
177400  001302                          BIC     #177400,$TMP2   ;CLEAR HI BYTE
031066                                  JSR     PC,INRDY        ;WAIT FOR INRDY
104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
021244                                  021244
000004                                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
```

```
 4958  024424  042704  000376                  BIC     #376,R4         ;CLEAR UNWANTED BITS
 4959  024430  012705  000001                  MOV     #1,R5           ;PUT "EXPECTED" IN R5
 4960  024434  120504                          CMPB    R5,R4           ;IS IN BCC MATCH SET?
 4961  024436  001401                          BEQ     25$
 4962  024440  104015                          ERROR   15              ;IN BCC MATCH ERROR
 4963  024442                          25$:
 4964  024442  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 4965  024444  021204                          021204                  ;GET LAST HALF
 4966  024446                          2$:
 4967
 4968
 4969                                          ;*************************** TEST 52 ****************************
 4970                                          ;*DDCMP EOM FUNCTION TEST
 4971                                          ;*THIS TEST LOADS OUT SILO WITH: 2 SYNCS,4 CHAR MESSAGE,EOM
 4972                                          ;*4 CHARACTER MESS,EOM. THE DATA STREAM IS CHECKED TO BE
 4973                                          ;*4 CHAR,BCC,4 CHAR,BCC,MARKS. THIS TEST VERIFYS THAT
 4974                                          ;*THE CHARCTERS LOADED WITH EOM SET ARE LOST
 4975                                          ;*ALL DATA AND BCC'S ARE CHECKED IN THE BIT WINDOW
 4976                                          ;*THE FOUR CHARACTER MESSAGE IS 0,125,252,377
 4977                                          ;*RECEIVED DATA IS VERIFIED, AND IN BCC MATCH IS CHECKED
 4978                                          ;;*************************************************************
 4979
 4980                                          ;  TEST 52
 4981                                          ;-------------
 4982                                  ;;*****************************************************************
 4983  024446  000004                  TST52:  SCOPE
 4984  024450  012737  000052  001202          MOV     #52,$TSTNM              ; LOAD THE NO. OF THIS TEST
 4985  024456  012737  025546  001442          MOV     #TST53,NEXT             ; POINT TO THE START OF NEXT TEST.
 4986                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
 4987  024464  104410                          MSTCLR                  ;MASTER CLEAR KMC11
 4988
 4989                                          ;LOAD OUT DATA SILO
 4990
 4991  024466  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
 4992  024472  012704  032012                  MOV     #MESDAT,R4      ;LOAD POINTER TO DATA
 4993  024476  005037  024606                  CLR     10$             ;CLEAR SOFT BCC
 4994  024502  012700  000004                  MOV     #4,R0           ;LOAD CHARACTER COUNT
 4995  024506  004737  031374                  JSR     PC,SYNLD        ;LOAD 2 SYNCS IN OUT SILO
 4996  024512  004737  030412                  JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
 4997  024516  004537  031530                  JSR     R5,MESLD        ;LOAD SILO WITH 4 CHAR MESS
 4998  024522  032012                          MESDAT                  ;ADDRESS OF MESSAGE
 4999  024524  000004                          4                       ;NUMBER OF CHARACTERS
 5000  024526  004737  031504                  JSR     PC,EOM          ;LOAD GARBAGE CHARACTER, WITH EOM SET
 5001  024532  004537  031530                  JSR     R5,MESLD        ;LOAD FOUR MORE CHARACTERS
 5002  024536  032012                          MESDAT                  ;ADDRESS OF MESSAGE
 5003  024540  000004                          4                       ;NUMBER OF CHACTERS
 5004  024542  004737  031504                  JSR     PC,EOM          ;SET EOM
 5005  024546  004737  030260                  JSR     PC,OCOR         ;WAIT FOR OCOR
 5006  024552  005003                          CLR     R3              ;CLEAR BIT COUNTER
 5007  024554  104413  000022                  DATACLK,22              ;CLOCK DATA
 5008  024560  112405                  12$:    MOVB    (R4)+,R5        ;LOAD R5 WITH CHAR
 5009  024562  010502                          MOV     R5,R2           ;LOAD R2 WITH CHAR
 5010
 5011                                          ;CHECK FIRST FOUR CHARACTER MESSAGE
 5012                                          ;IN THE BIT WINDOW (0,125,252,377)
 5013
```

```
5014  024564  012737  120001  031226          MOV     #CRC16,XPOLY    ;LOAD POLYNOMIAL
5015  024572  010537  024604                  MOV     R5,67$          ;LOAD SOFT CHAR FOR BCC
5016  024576  004537  031122                  JSR     R5,SIMBCC       ;CALCULATE SOFT BCC
5017  024602  000010                          10                      ;SHIFT COUNT
5018  024604  000000                  67$:    0                       ;CHARACTER
5019  024606  000000                  10$:    0                       ;OLD BCC
5020  024610  013737  031230  024606          MOV     CALBCC,10$      ;LOAD SOFT BCC FOR NEXT SHIFT
5021  024616  104413  000001          64$:    DATACLK,        1       ;SHIFT DATA IN TO BIT WINDOW
5022  024622  106002                          RORB    R2              ;SHIFT SOFT DATA
5023  024624  103005                          BCC     65$             ;BR IF A SPACE
5024  024626  004737  030226                  JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5025  024632  103406                          BCS     66$             ;BR IF OK (MARK)
5026  024634  104006                          ERROR   6               ;ERROR, BIT WINDOW WAS A SPACE
5027  024636  000404                          BR      66$             ;CONTINUE
5028  024640  004737  030226          65$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5029  024644  103001                          BCC     66$             ;BR IF OK (SPACE)
5030  024646  104006                          ERROR   6               ;ERROR, BIT WINDOW WAS A MARK
5031  024650                          66$:
5032  024650  005203                          INC     R3              ;BUMP BIT COUNTER
5033  024652  022703  000010                  CMP     #10,R3          ;DONE FULL 8 BITS YET
5034  024656  001357                          BNE     64$             ;BR IF NO
5035  024660  005003                          CLR     R3              ;CLEAR BIT COUNTER
5036  024662  005300                          DEC     R0              ;DEC CHARACTER COUNT
5037  024664  001335                          BNE     12$             ;BR IF NOT DONE YET
5038
5039                                          ;CHECK BCC FOR PRECEDING MESSAGE IN THE BIT WINDOW
5040
5041  024666  013700  031230                  MOV     CALBCC,R0       ;PUT BCC IN R0
5042  024672  104413  000001          68$:    DATACLK,1               ;SHIFT HARDWARE BCC
5043  024676  006000                          ROR     R0              ;SHIFT SOFT BCC
5044  024700  103005                          BCC     69$             ;BR IF CARRY CLEAR
5045  024702  004737  030226                  JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5046  024706  103406                          BCS     70$             ;BR IF OK (MARK)
5047  024710  104014                          ERROR   14              ;ERROR, CRC WRONG (SPACE)
5048  024712  000404                          BR      70$             ;CONTINUE
5049  024714  004737  030226          69$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5050  024720  103001                          BCC     70$             ;BR IF OK (SPACE)
5051  024722  104014                          ERROR   14              ;ERROR, CRC WRONG (MARK)
5052  024724                          70$:
5053  024724  005203                          INC     R3              ;BUMP BIT COUNTER
5054  024726  022703  000020                  CMP     #20,R3          ;FINISHED BCC YET?
5055  024732  001357                          BNE     68$             ;BR IF NO
5056  024734  005003                          CLR     R3              ;CLEAR BIT COUNTER
5057  024736  012700  000004                  MOV     #4,R0           ;RESET CHARACTER COUNTER
5058  024742  012704  032012                  MOV     #MESDAT,R4      ;LOAD MESSAGE POINTER
5059  024746  005037  025000                  CLR     11$             ;CLR SOFT BCC
5060  024752  112405                  13$:    MOVB    (R4)+,R5        ;LOAD CHAR IN R5
5061  024754  010502                          MOV     R5,R2           ;LOAD CHAR IN R2
5062
5063                                          ;CHECK SECOND MESSAGE IN THE BIT WINDOW (0,125,252,377)
5064
5065  024756  012737  120001  031226          MOV     #CRC16,XPOLY    ;LOAD POLYNOMIAL
5066  024764  010537  024776                  MOV     R5,76$          ;LOAD SOFT CHAR FOR BCC
5067  024770  004537  031122                  JSR     R5,SIMBCC       ;CALCULATE SOFT BCC
5068  024774  000010                          10                      ;SHIFT COUNT
5069  024776  000000                  76$:    0                       ;CHARACTER
```

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5070  025000  000000                  11$:    0                       ;OLD BCC
5071  025002  013737  031230  025000          MOV     CALBCC,11$      ;LOAD SOFT BCC FOR NEXT SHIFT
5072  025010  104413  000001          73$:    DATACLK,        1       ;SHIFT DATA IN TO BIT WINDOW
5073  025014  106002                          RORB    R2              ;SHIFT SOFT DATA
5074  025016  103005                          BCC     74$             ;BR IF A SPACE
5075  025020  004737  030226                  JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5076  025024  103406                          BCS     75$             ;BR IF OK (MARK)
5077  025026  104006                          ERROR   6               ;ERROR, BIT WINDOW WAS A SPACE
5078  025030  000404                          BR      75$             ;CONTINUE
5079  025032  004737  030226          74$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5080  025036  103001                          BCC     75$             ;BR IF OK (SPACE)
5081  025040  104006                          ERROR   6               ;ERROR, BIT WINDOW WAS A MARK
5082  025042                          75$:
5083  025042  005203                          INC     R3              ;BUMP BIT COUNTER
5084  025044  022703  000010                  CMP     #10,R3          ;DONE FULL 8 BITS YET
5085  025050  001357                          BNE     73$             ;BR IF NO
5086  025052  005003                          CLR     R3              ;CLEAR BIT COUNTER
5087  025054  005300                          DEC     R0              ;DEC CHARACTER COUNT
5088  025056  001335                          BNE     13$             ;BR IF NOT DONE YET
5089
5090                                          ;CHECK BCC FOR PRECEDING MESSAGE IN THE BIT WINDOW
5091
5092  025060  013700  031230                  MOV     CALBCC,R0       ;PUT BCC IN R0
5093  025064  104413  000001          77$:    DATACLK,1               ;SHIFT HARDWARE BCC
5094  025070  006000                          ROR     R0              ;SHIFT SOFT BCC
5095  025072  103005                          BCC     78$             ;BR IF CARRY CLEAR
5096  025074  004737  030226                  JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5097  025100  103406                          BCS     79$             ;BR IF OK (MARK)
5098  025102  104014                          ERROR   14              ;ERROR, CRC WRONG (SPACE)
5099  025104  000404                          BR      79$             ;CONTINUE
5100  025106  004737  030226          78$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5101  025112  103001                          BCC     79$             ;BR IF OK (SPACE)
5102  025114  104014                          ERROR   14              ;ERROR, CRC WRONG (MARK)
5103  025116                          79$:
5104  025116  005203                          INC     R3              ;BUMP BIT COUNTER
5105  025120  022703  000020                  CMP     #20,R3          ;FINISHED BCC YET?
5106  025124  001357                          BNE     77$             ;BR IF NO
5107  025126  005003                          CLR     R3              ;CLEAR BIT COUNTER
5108
5109                                          ;CHECK TO SEE IF TRANSMITTER IS MARKING
5110
5111  025130  104413  000001          2$:     DATACLK,        1       ;CLOCK TRANSMITTER
5112  025134  004737  030226                  JSR     PC,GETSI        ;LOOK AT WINDOW
5113  025140  103401                          BCS     3$              ;IT SHOULD BE MARKING
5114  025142  104024                          ERROR   24              ;ERROR, BIT WAS A SPACE
5115  025144  005203                  3$:     INC     R3              ;BUMP BIT COUNTER
5116  025146  022703  000007                  CMP     #7,R3           ;DONE YET
5117  025152  001366                          BNE     2$              ;BR IF NO
5118  025154  104413  000010                  DATACLK,        10      ;GIVE ENOUGH TICKS TO CLEAR OUT ACTIVE
5119  025160  005003                          CLR     R3              ;CLEAR BIT COUNTER
5120  025162  104413  000001          4$:     DATACLK,        1       ;SHIFT OUT NEXT BIT
5121  025166  004737  030226                  JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5122  025172  103401                          BCS     .+4             ;BR IF IT IS A MARK
5123  025174  104024                          ERROR   24              ;ERROR, TRANSMITTER IS NOT MARKING
5124  025176  005203                          INC     R3              ;INC BIT COUNT
5125  025200  022703  000020                  CMP     #20,R3          ;DONE YET?
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5126  025204  001366                          BNE     4$              ;BR IF NO
5127
5128                                          ;CHECK TO SEE THAT FIRST FOUR CHARACTER MESSAGE
5129                                          ;WAS RECEIVED CORRECTLY (0,125,252,377)
5130
5131  025206  104413  000001                  DATACLK,        1       ;GET LAST BIT IN RECEIVER
5132  025212  012703  000004                  MOV     #4,R3           ;R3=CHARACTER COUNT
5133  025216  012702  032012                  MOV     #MESDAT,R2      ;LOAD MESSAGE POINTER IN R2
5134  025222  004737  031066          40$:    JSR     PC,INRDY        ;WAIT FOR INRDY
5135  025226  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5136  025230  021204                          021204
5137  025232  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
5138  025236  112205                          MOVB    (R2)+,R5        ;PUT "EXPECTED" IN R5
5139  025240  120504                          CMPB    R5,R4           ;IS RECEIVED DATA CORRECT?
5140  025242  001401                          BEQ     41$             ;BR IF YES
5141  025244  104010                          ERROR   10              ;RECEIVE DATA ERROR
5142  025246  005303          41$:    DEC     R3              ;DEC CHARACTER COUNT
5143  025250  001364                          BNE     40$             ;BR IF NOT DONE YET
5144
5145                                          ;CHECK TO SEE THAT IN BCC MATCH IS SET
5146                                          ;AND THAT THE BCC WAS RECEIVED CORRECTLY
5147
5148  025252  004737  031066                  JSR     PC,INRDY        ;WAIT FOR INRDY
5149  025256  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5150  025260  021204                          021204                  ;GET FIRST HALF OF CRC
5151  025262  116137  000004  001302          MOVB    4(R1),$TMP2     ;PUT IN $TMP2
5152  025270  042737  177400  001302          BIC     #177400,$TMP2   ;CLEAR HI BYTE
5153  025276  004737  031066                  JSR     PC,INRDY        ;WAIT FOR INRDY
5154  025302  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5155  025304  021244                          021244
5156  025306  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
5157  025312  042704  000376                  BIC     #376,R4         ;CLEAR UNWANTED BITS
5158  025316  012705  000001                  MOV     #1,R5           ;PUT "EXPECTED" IN R5
5159  025322  120504                          CMPB    R5,R4           ;IS IN BCC MATCH SET?
5160  025324  001401                          BEQ     50$
5161  025326  104015                          ERROR   15              ;IN BCC MATCH ERROR
5162  025330                          50$:
5163  025330  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5164  025332  021204                          021204                  ;GET LAST HALF
5165  025334  116137  000004  001301          MOVB    4(R1),$TMP1+1   ;PUT IN $TMP1
5166  025342  042737  000377  001300          BIC     #377,$TMP1      ;CLEAR LO BYTE
5167  025350  053737  001300  001302          BIS     $TMP1,$TMP2     ;16 BIT BCC NOW IN $TMP2
5168  025356  023737  031230  001302          CMP     CALBCC,$TMP2    ;IS IT CORRECT?
5169  025364  001401                          BEQ     42$             ;BR IF OK
5170  025366  104027                          ERROR   27
5171
5172                                          ;CHECK TO SEE THAT SECOND FOUR CHARACTER MESSAGE
5173                                          ;WAS RECEIVED CORRECTLY (0,125,252,377)
5174
5175  025370  012703  000004          42$:    MOV     #4,R3           ;R3=CHARACTER COUNT
5176  025374  012702  032012                  MOV     #MESDAT,R2      ;LOAD MESSAGE POINTER IN R2
5177  025400  004737  031066          43$:    JSR     PC,INRDY        ;WAIT FOR INRDY
5178  025404  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5179  025406  021204                          021204
5180  025410  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
5181  025414  112205                          MOVB    (R2)+,R5        ;PUT "EXPECTED" IN R5
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5182  025416  120504                          CMPB    R5,R4           ;IS RECEIVED DATA CORRECT?
5183  025420  001401                          BEQ     44$             ;BR IF YES
5184  025422  104010                          ERROR   10              ;RECEIVE DATA ERROR
5185  025424  005303                  44$:    DEC     R3              ;DEC CHARACTER COUNT
5186  025426  001364                          BNE     43$             ;BR IF NOT DONE YET
5187
5188                                          ;CHECK TO SEE THAT IN BCC MATCH IS SET
5189                                          ;AND THAT THE BCC WAS RECEIVED CORRECTLY
5190
5191  025430  004737  031066                  JSR     PC,INRDY        ;WAIT FOR INRDY
5192  025434  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5193  025436  021204                          021204                  ;GET FIRST HALF OF CRC
5194  025440  116137  000004  001302          MOVB    4(R1),$TMP2     ;PUT IN $TMP2
5195  025446  042737  177400  001302          BIC     #177400,$TMP2   ;CLEAR HI BYTE
5196  025454  004737  031066                  JSR     PC,INRDY        ;WAIT FOR INRDY
5197  025460  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5198  025462  021244                          021244
5199  025464  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
5200  025470  042704  000376                  BIC     #376,R4         ;CLEAR UNWANTED BITS
5201  025474  012705  000001                  MOV     #1,R5           ;PUT "EXPECTED" IN R5
5202  025500  120504                          CMPB    R5,R4           ;IS IN BCC MATCH SET?
5203  025502  001401                          BEQ     51$
5204  025504  104015                          ERROR   15              ;IN BCC MATCH ERROR
5205  025506                          51$:
5206  025506  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5207  025510  021204                          021204                  ;GET LAST HALF
5208  025512  116137  000004  001301          MOVB    4(R1),$TMP1+1   ;PUT IN $TMP1
5209  025520  042737  000377  001300          BIC     #377,$TMP1      ;CLEAR LO BYTE
5210  025526  053737  001300  001302          BIS     $TMP1,$TMP2     ;16 BIT BCC NOW IN $TMP2
5211  025534  023737  031230  001302          CMP     CALBCC,$TMP2    ;IS IT CORRECT?
5212  025542  001401                          BEQ     5$              ;BR IF OK
5213  025544  104027                          ERROR   27
5214  025546                          5$:
5215
5216
5217                                          ;***************************** TEST 53 *****************************
5218                                          ;*DDCMP EOM FUNCTION TEST
5219                                          ;*THIS TEST LOADS OUT SILO WITH: 2 SYNCS,4 CHAR MESSAGE,EOM
5220                                          ;*SOM,4 CHAR MESS,EOM. THE DATA STREAM IS CHECKED TO BE
5221                                          ;*4 CHAR,BCC,4 CHAR,BCC,MARKS. THIS TEST VERIFYS THAT
5222                                          ;*THE CHARCTERS LOADED WITH EOM SET ARE LOST
5223                                          ;*ALSO THAT THE CHAR LOADED WITH SOM IS NOT IN THE BCC
5224                                          ;*ALL DATA AND BCC'S ARE CHECKED IN THE BIT WINDOW
5225                                          ;*THE FOUR CHARACTER MESSAGE IS 0,125,252,377
5226                                          ;*RECEIVED DATA IS VERIFIED, AND IN BCC MATCH IS CHECKED
5227                                          ;;*************************************************************
5228
5229                                          ;  TEST 53
5230                                          ;--------------
5231                                  ;;;*****************************************************************
5232  025546  000004                  TST53:  SCOPE
5233  025550  012737  000053  001202          MOV     #53,$TSTNM              ; LOAD THE NO. OF THIS TEST
5234  025556  012737  026746  001442          MOV     #TST54,NEXT             ; POINT TO THE START OF NEXT TEST.
5235                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
5236  025564  104410                          MSTCLR                  ;MASTER CLEAR KMC11
5237
```

```
                                                ;LOAD OUT DATA SILO
                                                
025566  012711  004000                          MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
025572  012704  032012                          MOV     #MESDAT,R4      ;LOAD POINTER TO DATA
025576  005037  025712                          CLR     10$             ;CLEAR SOFT BCC
025602  012700  000004                          MOV     #4,R0           ;LOAD CHARACTER COUNT
025606  004737  031374                          JSR     PC,SYNLD        ;LOAD 2 SYNCS IN OUT SILO
025612  004737  030412                          JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
025616  004537  031530                          JSR     R5,MESLD        ;LOAD SILO WITH 4 CHAR MESS
025622  032012                                  MESDAT                  ;ADDRESS OF MESSAGE
025624  000004                                  4                       ;NUMBER OF CHARACTERS
025626  004737  031504                          JSR     PC,EOM          ;LOAD GARBAGE CHARACTER, WITH EOM SET
025632  004737  031454                          JSR     PC,SOM          ;LOAD GARBAGE CHAR WITH SOM SET
025636  004537  031530                          JSR     R5,MESLD        ;LOAD FOUR MORE CHARACTERS
025642  032012                                  MESDAT                  ;ADDRESS OF MESSAGE
025644  000004                                  4                       ;NUMBER OF CHACTERS
025646  004737  031504                          JSR     PC,EOM          ;SET EOM
025652  004737  030260                          JSR     PC,OCOR         ;WAIT FOR OCOR
025656  005003                                  CLR     R3              ;CLEAR BIT COUNTER
025660  104413  000022                          DATACLK,22              ;CLOCK DATA
025664  112405                          12$:    MOVB    (R4)+,R5        ;LOAD R5 WITH CHAR
025666  010502                                  MOV     R5,R2           ;LOAD R2 WITH CHAR

                                                ;CHECK FIRST FOUR CHARACTER MESSAGE
                                                ;IN THE BIT WINDOW (0,125,252,377)

025670  012737  120001  031226                  MOV     #CRC16,XPOLY    ;LOAD POLYNOMIAL
025676  010537  025710                          MOV     R5,67$          ;LOAD SOFT CHAR FOR BCC
025702  004537  031122                          JSR     R5,SIMBCC       ;CALCULATE SOFT BCC
025706  000010                                  10                      ;SHIFT COUNT
025710  000000                          67$:    0                       ;CHARACTER
025712  000000                          10$:    0                       ;OLD BCC
025714  013737  031230  025712                  MOV     CALBCC,10$      ;LOAD SOFT BCC FOR NEXT SHIFT
025722  104413  000001                  64$:    DATACLK,        1       ;SHIFT DATA IN TO BIT WINDOW
025726  106002                                  RORB    R2              ;SHIFT SOFT DATA
025730  103005                                  BCC     65$             ;BR IF A SPACE
025732  004737  030226                          JSR     PC,GETSI        ;LOOK AT BIT WINDOW
025736  103406                                  BCS     66$             ;BR IF OK (MARK)
025740  104006                                  ERROR   6               ;ERROR, BIT WINDOW WAS A SPACE
025742  000404                                  BR      66$             ;CONTINUE
025744  004737  030226                  65$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
025750  103001                                  BCC     66$             ;BR IF OK (SPACE)
025752  104006                                  ERROR   6               ;ERROR, BIT WINDOW WAS A MARK
025754                                  66$:
025754  005203                                  INC     R3              ;BUMP BIT COUNTER
025756  022703  000010                          CMP     #10,R3          ;DONE FULL 8 BITS YET
025762  001357                                  BNE     64$             ;BR IF NO
025764  005003                                  CLR     R3              ;CLEAR BIT COUNTER
025766  005300                                  DEC     R0              ;DEC CHARACTER COUNT
025770  001335                                  BNE     12$             ;BR IF NOT DONE YET

                                                ;CHECK BCC FOR PRECEDING MESSAGE IN THE BIT WINDOW

025772  013700  031230                          MOV     CALBCC,R0       ;PUT BCC IN R0
026000  104413  000001                  68$:    DATACLK,1               ;SHIFT HARDWARE BCC
026002  006000                                  ROR     R0              ;SHIFT SOFT BCC
```

```
5294  026004  103005                        BCC     69$             ;BR IF CARRY CLEAR
5295  026006  004737  030226                JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5296  026012  103406                        BCS     70$             ;BR IF OK (MARK)
5297  026014  104014                        ERROR   14              ;ERROR, CRC WRONG (SPACE)
5298  026016  000404                        BR      70$             ;CONTINUE
5299  026020  004737  030226        69$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5300  026024  103001                        BCC     70$             ;BR IF OK (SPACE)
5301  026026  104014                        ERROR   14              ;ERROR, CRC WRONG (MARK)
5302  026030                        70$:
5303  026030  005203                        INC     R3              ;BUMP BIT COUNTER
5304  026032  022703  000020                CMP     #20,R3          ;FINISHED BCC YET?
5305  026036  001357                        BNE     68$             ;BR IF NO
5306  026040  005003                        CLR     R3              ;CLEAR BIT COUNTER
5307
5308                                        ;CHECK CHARACTER LOADED WITH SOM (000), IN THE BIT WINDOW
5309
5310  026042  005005                        CLR     R5              ;CHARACTER LOADED WITH SOM
5311  026044  010502                        MOV     R5,R2           ;LOAD R2 WITH CHAR
5312  026046  104413  000001        32$:    DATACLK,        1       ;CLOCK TRANSMITTER
5313  026052  106002                        RORB    R2              ;SHIFT SOFT DATA
5314  026054  103005                        BCC     30$             ;BR IF SPACE
5315  026056  004737  030226                JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5316  026062  103406                        BCS     31$             ;BR IF OK (MARK)
5317  026064  104006                        ERROR   6               ;ERROR,BIT WINDOW WAS A SPACE
5318  026066  000404                        BR      31$             ;CONTINUE
5319  026070  004737  030226        30$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5320  026074  103001                        BCC     31$             ;BR IF OK (SPACE)
5321  026076  104006                        ERROR   6               ;ERROR,BIT WINDOW WAS A MARK
5322  026100  005203                31$:    INC     R3              ;BUMP BIT COUNTER
5323  026102  022703  000010                CMP     #10,R3          ;DONE CHARACTER YET?
5324  026106  001357                        BNE     32$             ;BR IF NO
5325  026110  005003                        CLR     R3              ;RESET BIT COUNTER
5326  026112  012700  000004                MOV     #4,R0           ;RESET CHARACTER COUNTER
5327  026116  012704  032012                MOV     #MESDAT,R4      ;LOAD MESSAGE POINTER
5328  026122  005037  026154                CLR     11$             ;CLR SOFT BCC
5329  026126  112405                13$:    MOVB    (R4)+,R5        ;LOAD CHAR IN R5
5330  026130  010502                        MOV     R5,R2           ;LOAD CHAR IN R2
5331
5332                                        ;CHECK SECOND MESSAGE IN THE BIT WINDOW (0,125,252,377)
5333
5334  026132  012737  120001  031226        MOV     #CRC16,XPOLY    ;LOAD POLYNOMIAL
5335  026140  010537  026152                MOV     R5,76$          ;LOAD SOFT CHAR FOR BCC
5336  026144  004537  031122                JSR     R5,SIMBCC       ;CALCULATE SOFT BCC
5337  026150  000010                        10                      ;SHIFT COUNT
5338  026152  000000                76$:    0                       ;CHARACTER
5339  026154  000000                11$:    0                       ;OLD BCC
5340  026156  013737  031230  026154        MOV     CALBCC,11$      ;LOAD SOFT BCC FOR NEXT SHIFT
5341  026164  104413  000001        73$:    DATACLK,        1       ;SHIFT DATA IN TO BIT WINDOW
5342  026170  106002                        RORB    R2              ;SHIFT SOFT DATA
5343  026172  103005                        BCC     74$             ;BR IF A SPACE
5344  026174  004737  030226                JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5345  026200  103406                        BCS     75$             ;BR IF OK (MARK)
5346  026202  104006                        ERROR   6               ;ERROR, BIT WINDOW WAS A SPACE
5347  026204  000404                        BR      75$             ;CONTINUE
5348  026206  004737  030226        74$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5349  026212  103001                        BCC     75$             ;BR IF OK (SPACE)
```

```
5350  026214  104006                          ERROR   6               ;ERROR, BIT WINDOW WAS A MARK
5351  026216                          75$:
5352  026216  005203                          INC     R3              ;BUMP BIT COUNTER
5353  026220  022703  000010                  CMP     #10,R3          ;DONE FULL 8 BITS YET
5354  026224  001357                          BNE     73$             ;BR IF NO
5355  026226  005003                          CLR     R3              ;CLEAR BIT COUNTER
5356  026230  005300                          DEC     R0              ;DEC CHARACTER COUNT
5357  026232  001335                          BNE     13$             ;BR IF NOT DONE YET
5358
5359                                          ;CHECK BCC FOR PRECEDING MESSAGE IN THE BIT WINDOW
5360
5361  026234  013700  031230                  MOV     CALBCC,R0       ;PUT BCC IN R0
5362  026240  104413  000001          77$:    DATACLK,1               ;SHIFT HARDWARE BCC
5363  026244  006000                          ROR     R0              ;SHIFT SOFT BCC
5364  026246  103005                          BCC     78$             ;BR IF CARRY CLEAR
5365  026250  004737  030226                  JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5366  026254  103406                          BCS     79$             ;BR IF OK (MARK)
5367  026256  104014                          ERROR   14              ;ERROR, CRC WRONG (SPACE)
5368  026260  000404                          BR      79$             ;CONTINUE
5369  026262  004737  030226          78$:    JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5370  026266  103001                          BCC     79$             ;BR IF OK (SPACE)
5371  026270  104014                          ERROR   14              ;ERROR, CRC WRONG (MARK)
5372  026272                          79$:
5373  026272  005203                          INC     R3              ;BUMP BIT COUNTER
5374  026274  022703  000020                  CMP     #20,R3          ;FINISHED BCC YET?
5375  026300  001357                          BNE     77$             ;BR IF NO
5376  026302  005003                          CLR     R3              ;CLEAR BIT COUNTER
5377
5378                                          ;CHECK TO SEE IF TRANSMITTER IS MARKING
5379
5380  026304  104413  000001          2$:     DATACLK,        1       ;CLOCK TRANSMITTER
5381  026310  004737  030226                  JSR     PC,GETSI        ;LOOK AT WINDOW
5382  026314  103401                          BCS     3$              ;IT SHOULD BE MARKING
5383  026316  104024                          ERROR   24              ;ERROR, BIT WAS A SPACE
5384  026320  005203                  3$:     INC     R3              ;BUMP BIT COUNTER
5385  026322  022703  000007                  CMP     #7,R3           ;DONE YET
5386  026326  001366                          BNE     2$              ;BR IF NO
5387  026330  104413  000010                  DATACLK,        10      ;GIVE ENOUGH TICKS TO CLEAR OUT ACTIVE
5388  026334  005003                          CLR     R3              ;CLEAR BIT COUNTER
5389  026336  104413  000001          4$:     DATACLK,        1       ;SHIFT OUT NEXT BIT
5390  026342  004737  030226                  JSR     PC,GETSI        ;LOOK AT BIT WINDOW
5391  026346  103401                          BCS     .+4             ;BR IF IT IS A MARK
5392  026350  104024                          ERROR   24              ;ERROR, TRANSMITTER IS NOT MARKING
5393  026352  005203                          INC     R3              ;INC BIT COUNT
5394  026354  022703  000020                  CMP     #20,R3          ;DONE YET?
5395  026360  001366                          BNE     4$              ;BR IF NO
5396
5397                                          ;CHECK TO SEE THAT FIRST FOUR CHARACTER MESSAGE
5398                                          ;WAS RECEIVED CORRECTLY (0,125,252,377)
5399
5400  026362  104413  000001                  DATACLK,        1       ;GET LAST BIT IN RECEIVER
5401  026366  012703  000004                  MOV     #4,R3           ;R3=CHARACTER COUNT
5402  026372  012702  032012                  MOV     #MESDAT,R2      ;LOAD MESSAGE POINTER IN R2
5403  026376  004737  031066          40$:    JSR     PC,INRDY        ;WAIT FOR INRDY
5404  026402  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5405  026404  021204                          021204
```

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5406  026406  016104  000004            MOV     4(R1),R4        ;PUT "FOUND" IN R4
5407  026412  112205                    MOVB    (R2)+,R5        ;PUT "EXPECTED" IN R5
5408  026414  120504                    CMPB    R5,R4           ;IS RECEIVED DATA CORRECT?
5409  026416  001401                    BEQ     41$             ;BR IF YES
5410  026420  104010                    ERROR   10              ;RECEIVE DATA ERROR
5411  026422  005303            41$:    DEC     R3              ;DEC CHARACTER COUNT
5412  026424  001364                    BNE     40$             ;BR IF NOT DONE YET
5413
5414                                    ;CHECK TO SEE THAT IN BCC MATCH IS SET
5415                                    ;AND THAT THE BCC WAS RECEIVED CORRECTLY
5416
5417  026426  004737  031066            JSR     PC,INRDY        ;WAIT FOR INRDY
5418  026432  104412                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5419  026434  021204                    021204                  ;GET FIRST HALF OF CRC
5420  026436  116137  000004  001302    MOVB    4(R1),$TMP2     ;PUT IN $TMP2
5421  026444  042737  177400  001302    BIC     #177400,$TMP2   ;CLEAR HI BYTE
5422  026452  004737  031066            JSR     PC,INRDY        ;WAIT FOR INRDY
5423  026456  104412                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5424  026460  021244                    021244
5425  026462  016104  000004            MOV     4(R1),R4        ;PUT "FOUND" IN R4
5426  026466  042704  000376            BIC     #376,R4         ;CLEAR UNWANTED BITS
5427  026472  012705  000001            MOV     #1,R5           ;PUT "EXPECTED" IN R5
5428  026476  120504                    CMPB    R5,R4           ;IS IN BCC MATCH SET?
5429  026500  001401                    BEQ     50$
5430  026502  104015                    ERROR   15              ;IN BCC MATCH ERROR
5431  026504                    50$:
5432  026504  104412                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5433  026506  021204                    021204                  ;GET LAST HALF
5434  026510  116137  000004  001301    MOVB    4(R1),$TMP1+1   ;PUT IN $TMP1
5435  026516  042737  000377  001300    BIC     #377,$TMP1      ;CLEAR LO BYTE
5436  026524  053737  001300  001302    BIS     $TMP1,$TMP2     ;16 BIT BCC NOW IN $TMP2
5437  026532  023737  031230  001302    CMP     CALBCC,$TMP2    ;IS IT CORRECT?
5438  026540  001401                    BEQ     45$             ;BR IF OK
5439  026542  104027                    ERROR   27
5440
5441                                    ;CHECK THAT CHARACTER LOADED WITH SOM WAS RECEIVED (000)
5442
5443  026544  004737  031066    45$:    JSR     PC,INRDY        ;WAIT FOR INRDY
5444  026550  104412                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5445  026552  021204                    021204                  ;GET RECEIVE DATA
5446  026554  016104  000004            MOV     4(R1),R4        ;PUT "FOUND" IN R4
5447  026560  005005                    CLR     R5              ;PUT "EXPECTED" IN R5
5448  026562  120504                    CMPB    R5,R4           ;IS RECEVIED DATA CORRECT?
5449  026564  001401                    BEQ     42$             ;BR IF YES
5450  026566  104010                    ERROR   10              ;RECEIVE DATA ERROR
5451
5452                                    ;CHECK TO SEE THAT SECOND FOUR CHARACTER MESSAGE
5453                                    ;WAS RECEIVED CORRECTLY (0,125,252,377)
5454
5455  026570  012703  000004    42$:    MOV     #4,R3           ;R3=CHARACTER COUNT
5456  026574  012702  032012            MOV     #MESDAT,R2      ;LOAD MESSAGE POINTER IN R2
5457  026600  004737  031066    43$:    JSR     PC,INRDY        ;WAIT FOR INRDY
5458  026604  104412                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5459  026606  021204                    021204
5460  026610  016104  000004            MOV     4(R1),R4        ;PUT "FOUND" IN R4
5461  026614  112205                    MOVB    (R2)+,R5        ;PUT "EXPECTED" IN R5
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5462  026616  120504                        CMPB    R5,R4           ;IS RECEIVED DATA CORRECT?
5463  026620  001401                        BEQ     44$             ;BR IF YES
5464  026622  104010                        ERROR   10              ;RECEIVE DATA ERROR
5465  026624  005303                44$:    DEC     R3              ;DEC CHARACTER COUNT
5466  026626  001364                        BNE     43$             ;BR IF NOT DONE YET
5467
5468                                        ;CHECK TO SEE THAT IN BCC MATCH IS SET
5469                                        ;AND THAT THE BCC WAS RECEIVED CORRECTLY
5470
5471  026630  004737  031066               JSR     PC,INRDY        ;WAIT FOR INRDY
5472  026634  104412                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5473  026636  021204                        021204                  ;GET FIRST HALF OF CRC
5474  026640  116137  000004  001302        MOVB    4(R1),$TMP2     ;PUT IN $TMP2
5475  026646  042737  177400  001302        BIC     #177400,$TMP2   ;CLEAR HI BYTE
5476  026654  004737  031066               JSR     PC,INRDY        ;WAIT FOR INRDY
5477  026660  104412                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5478  026662  021244                        021244
5479  026664  016104  000004               MOV     4(R1),R4        ;PUT "FOUND" IN R4
5480  026670  042704  000376               BIC     #376,R4         ;CLEAR UNWANTED BITS
5481  026674  012705  000001               MOV     #1,R5           ;PUT "EXPECTED" IN R5
5482  026700  120504                        CMPB    R5,R4           ;IS IN BCC MATCH SET?
5483  026702  001401                        BEQ     51$
5484  026704  104015                        ERROR   15              ;IN BCC MATCH ERROR
5485  026706                        51$:
5486  026706  104412                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5487  026710  021204                        021204                  ;GET LAST HALF
5488  026712  116137  000004  001301        MOVB    4(R1),$TMP1+1   ;PUT IN $TMP1
5489  026720  042737  000377  001300        BIC     #377,$TMP1      ;CLEAR LO BYTE
5490  026726  053737  001300  001302        BIS     $TMP1,$TMP2     ;16 BIT BCC NOW IN $TMP2
5491  026734  023737  031230  001302        CMP     CALBCC,$TMP2    ;IS IT CORRECT?
5492  026742  001401                        BEQ     5$              ;BR IF OK
5493  026744  104027                        ERROR   27
5494  026746                          5$:
5495
5496
5497                                        ;***************************** TEST 54 ****************************
5498                                        ;*EMPTY SILO TEST
5499                                        ;*LOAD SILO WITH 2 SYNCS, 4 CHAR MESSAGE, SINGLE CLOCK
5500                                        ;*UNTIL THE SILO IS EMPTY, LOAD 4 MORE CHARACTERS IN THE
5501                                        ;*SILO. GIVE MORE TICKS, AND VERIFY THAT ONLY THE FIRST
5502                                        ;*4 CHARACTER MESSAGE WAS RECEIVED AND THAT RTS IS CLEAR
5503                                        ;:**************************************************************
5504
5505                                        ;  TEST 54
5506                                        ;-------------
5507                                  ;;****************************************************************
5508  026746  000004                TST54:  SCOPE
5509  026750  012737  000054  001202        MOV     #54,$TSTNM              ; LOAD THE NO. OF THIS TEST
5510  026756  012737  027200  001442        MOV     #TST55,NEXT             ; POINT TO THE START OF NEXT TEST.
5511                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
5512  026764  104410                        MSTCLR                  ;MASTER CLEAR KMC11
5513  026766  012711  004000               MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
5514  026772  012702  032012               MOV     #MESDAT,R2      ;R2 POINTS TO MESSAGE
5515  026776  012700  000004               MOV     #4,R0           ;R0 = CHAR COUNT
5516  027002  004737  031374               JSR     PC,SYNLD        ;LOAD SILO WITH TWO SYNCS
5517  027006  004737  030412               JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
```

```
5518  027012  004537  031530              JSR     R5,MESLD        ;LOAD MESSAGE IN SILO
5519  027016  032012                      MESDAT                  ;START OF MESSAGE
5520  027020  000004                      4                       ;CHARACTER COUNT
5521  027022  004737  030260              JSR     PC,OCOR         ;WAIT FOR OCOR
5522  027026  104413  000065              DATACLK,        65      ;CLOCK DATA (EMPTY SILO)
5523  027032  004537  031530              JSR     R5,MESLD        ;PUT MORE CHARACTERS IN SILO
5524  027036  032012                      MESDAT
5525  027040  000004                      4
5526  027042  004737  030260              JSR     PC,OCOR
5527  027046  104413  000005              DATACLK,        5       ;CLOCK UNTIL RTS IS CLEARED
5528  027052  104412                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5529  027054  021264                      021264                  ;GET RTS
5530  027056  032761  000040  000004      BIT     #BIT5,4(R1)     ;IS IT CLEAR?
5531  027064  001401                      BEQ     5$              ;BR IF YES
5532  027066  104034                      ERROR   34              ;ERROR, RTS NOT CLEAR
5533  027070  104413  000041      5$:     DATACLK,        41      ;CLOCK XMITTER SOME MORE
5534  027074  004737  031066      1$:     JSR     PC,INRDY        ;OK LETS CHECK WHAT WAS RECEIVED
5535  027100  104412                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5536  027102  021204                      021204                  ;GET RECEIVE DATA
5537  027104  016104  000004              MOV     4(R1),R4        ;PUT IT IN R4
5538  027110  112205                      MOVB    (R2)+,R5        ;R5 = "EXPECTED"
5539  027112  120504                      CMPB    R5,R4           ;IS DATA CORRECT?
5540  027114  001401                      BEQ     2$              ;BR IF OK
5541  027116  104010                      ERROR   10              ;DATA ERROR
5542  027120  005300      2$:     DEC     R0                      ;DEC CHAR COUNT
5543  027122  001364                      BNE     1$              ;BR IF NOT DONE YET
5544  027124  004737  031066      3$:     JSR     PC,INRDY        ;WAIT FOR INRDY
5545  027130  104412                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5546  027132  021204                      021204                  ;GET RECEIVE DATA
5547  027134  016104  000004              MOV     4(R1),R4        ;PUT IT IN "FOUND"
5548  027140  012705  000377              MOV     #377,R5         ;R5 = "EXPECTED"
5549  027144  120504                      CMPB    R5,R4           ;SHOULD SEE 377
5550  027146  001401                      BEQ     4$              ;BR IF OK
5551  027150  104010                      ERROR   10              ;ERROR, TRANSMITTER DID NOT ABORT
5552  027152  004737  031066      4$:     JSR     PC,INRDY        ;WAIT FOR INRDY
5553  027156  104412                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5554  027160  021204                      021204                  ;GET RECEIVE DATA
5555  027162  016104  000004              MOV     4(R1),R4        ;PUT IT IN "FOUND"
5556  027166  012705  000377              MOV     #377,R5         ;R5 = "EXPECTED"
5557  027172  120504                      CMPB    R5,R4           ;SHOULD SEE 377
5558  027174  001401                      BEQ     10$             ;BR IF OK
5559  027176  104010                      ERROR   10              ;ERROR, TRANSMITTER DID NOT ABORT
5560  027200                      10$:
5561
5562
5563                                      ;***************************** TEST 55 ****************************
5564                                      ;*HALF DUPLEX TEST
5565                                      ;*SET LINE UNIT LOOP AND HALF DUPLEX, SEND SYNCS AND A
5566                                      ;*MESSAGE. VERIFY THAT IN-ACTIVE AND IN-READY ARE CLEAR
5567                                      ;;**********************************************************************
5568
5569                                      ;  TEST 55
5570                                      ;--------------
5571                                      ;;**********************************************************************
5572  027200  000004              TST55:  SCOPE
5573  027202  012737  000055  001202      MOV     #55,$TSTNM              ; LOAD THE NO. OF THIS TEST
```

```
5574  027210  012737  027316  001442          MOV     #TST56,NEXT             ; POINT TO THE START OF NEXT TEST.
5575                                                                    ;R1 CONTAINS BASE KMC11 ADDRESS
5576  027216  104410                          MSTCLR                  ;MASTER CLEAR KMC11
5577  027220  012702  000012                  MOV     #12,R2          ;SAVE R2 FOR TYPEOUT
5578  027224  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
5579  027230  012761  000020  000004          MOV     #BIT4,4(R1)     ;LOAD PORT4
5580  027236  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5581  027240  122113                          122113                  ;SET H/D BIT
5582  027242  004737  031374                  JSR     PC,SYNLD        ;LOAD 2 SYNCS
5583  027246  004737  030412                  JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5584  027252  004537  031530                  JSR     R5,MESLD        ;LOAD 4 CHAR MESSAGE
5585  027256  032012                          MESDAT                  ;ADDRESS OF MESSAGE
5586  027260  000004                          4                       ;CHARACTER COUNT
5587  027262  004737  030260                  JSR     PC,OCOR         ;WAIT FOR OCOR
5588  027266  104413  000073                  DATACLK,        73      ;SEND MESSAGE
5589  027272  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5590  027274  021244                          021244                  ;READ LU-12
5591  027276  016104  000004                  MOV     4(R1),R4        ;PUT "FOUND" IN R4
5592  027302  042704  000257                  BIC     #257,R4         ;CLEAR UNWANTED BITS
5593  027306  005005                          CLR     R5              ;R5 = "EXPECTED"
5594  027310  120504                          CMPB    R5,R4           ;IN-ACTIVE AND IN-RDY SHOULD BE CLEAR
5595  027312  001401                          BEQ     1$              ;BR IF OK
5596  027314  104035                          ERROR   35              ;ERROR BOTH ARE NOT CLEAR
5597  027316                          1$:
5598
5599
5600                                          ;***************************** TEST 56 ****************************
5601                                          ;*DDCMP CABLE DATA TEST
5602                                          ;*THIS TEST LOADS OUT SILO WITH THE FOLLOWING:
5603                                          ;*4 SYNCS,16 CHAR,EOM,16 CHAR,EOM,16 CHAR,EOM
5604                                          ;*THE 16 CHARACTERS INCLUDE A FLOATING ONE AND ZERO
5605                                          ;*THE DATA IS TRANSMITTED OVER THE CABLE USING THE INTERNAL CLOCK
5606                                          ;*RECEIVED DATA IS VERIFIED AS IS IN BCC MATCH
5607                                          ;*LOOP-BACK CONNECTOR MUST BE ON TO RUN THIS TEST
5608                                          ;;*************************************************************************
5609
5610                                          ;  TEST 56
5611                                          ;-------------
5612                                  ;;*************************************************************************
5613  027316  000004                  TST56:  SCOPE
5614  027320  012737  000056  001202          MOV     #56,$TSTNM              ; LOAD THE NO. OF THIS TEST
5615  027326  012737  027706  001442          MOV     #TST57,NEXT             ; POINT TO THE START OF NEXT TEST.
5616                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
5617  027334  104410                          MSTCLR                  ;MASTER CLEAR KMC11
5618  027336  032737  040000  002050          BIT     #BIT14,STAT1    ;SKIP TEST IF NO
5619  027344  001557                          BEQ     3$              ;LOOPBACK CONNECTOR ON
5620  027346  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
5621  027352  004737  031374                  JSR     PC,SYNLD        ;LOAD 2 SYNCS
5622  027356  004737  031374                  JSR     PC,SYNLD        ;LOAD 2 MORE SYNCS
5623  027362  012737  120001  031226          MOV     #CRC16,XPOLY    ;LOAD POLYNOMIAL FOR SOFT CRC CALC
5624  027370  005037  027420                  CLR     6$              ;CLEAR OLD BCC
5625  027374  012703  000020                  MOV     #16.,R3         ;CHARACTER COUNT
5626  027400  012702  032016                  MOV     #FLTDAT,R2      ;R2= POINTER
5627  027404  112237  027416          7$:     MOVB    (R2)+,5$        ;LOAD CHAR FOR SOFT BCC CALC.
5628  027410  004537  031122                  JSR     R5,SIMBCC       ;CALC SOFT BCC
5629  027414  000010                          10                      ;SHIFT COUNT
```

```
5630  027416  000000                    5$:     0                       ;CHARACTER
5631  027420  000000                    6$:     0                       ;OLD BCC
5632  027422  013737  031230  027420            MOV     CALBCC,6$       ;LOAD OLD BCC
5633  027430  005303                            DEC     R3              ;DEC COUNT
5634  027432  001364                            BNE     7$              ;BR IF NOT DONE YET
5635  027434  004537  031530                    JSR     R5,MESLD        ;LOAD SILO
5636  027440  032016                            FLTDAT                  ;MESSAGE ADDRESS
5637  027442  000020                            16.                     ;CHARACTER COUNT
5638  027444  004737  031504                    JSR     PC,EOM          ;LOAD AN EOM
5639  027450  004537  031530                    JSR     R5,MESLD        ;LOAD SILO
5640  027454  032016                            FLTDAT                  ;MESSAGE ADDRESS
5641  027456  000020                            16.                     ;CHARACTER COUNT
5642  027460  004737  031504                    JSR     PC,EOM          ;LOAD AN EOM
5643  027464  004537  031530                    JSR     R5,MESLD        ;LOAD SILO
5644  027470  032016                            FLTDAT                  ;MESSAGE ADDRESS
5645  027472  000020                            16.                     ;CHARACTER COUNT
5646  027474  004737  031504                    JSR     PC,EOM          ;LOAD AN EOM
5647  027500  004737  030260                    JSR     PC,OCOR         ;WAIT FOR OCOR
5648  027504  005011                            CLR     (R1)            ;CLEAR LINE UNIT LOOP
5649  027506  012700  000003                    MOV     #3,R0           ;R0 = MESSAGE COUNT
5650  027512  012703  000020                    MOV     #16.,R3         ;R3= CHARACTER COUNT
5651  027516  012702  032016                    MOV     #FLTDAT,R2      ;LOAD MESSAGE POINTER IN R2
5652  027522  004737  031066            1$:     JSR     PC,INRDY        ;WAIT FOR INRDY
5653  027526  104412                            ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5654  027530  021204                            021204                  ;GET DATA FROM IN SILO
5655  027532  016104  000004                    MOV     4(R1),R4        ;PUT CHARACTER IN "FOUND"
5656  027536  112205                            MOVB    (R2)+,R5        ;PUT "EXPECTED" IN R5
5657  027540  120504                            CMPB    R5,R4           ;IS RECEIVED DATA CORRECT
5658  027542  001401                            BEQ     2$              ;BR IF OK
5659  027544  104025                            ERROR   25              ;DATA ERROR
5660  027546                            2$:
5661  027546  005303                            DEC     R3              ;DEC CHARACTER COUNT
5662  027550  001364                            BNE     1$              ;BR IF NOT DONE THIS MESSAGE
5663  027552  012703  000020                    MOV     #16.,R3         ;RESET CHARACTER COUNT
5664
5665                                            ;CHECK TO SEE THAT IN BCC MATCH IS SET
5666                                            ;AND THAT THE BCC WAS RECEIVED CORRECTLY
5667
5668  027556  004737  031066                    JSR     PC,INRDY        ;WAIT FOR INRDY
5669  027562  104412                            ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5670  027564  021204                            021204                  ;GET FIRST HALF OF CRC
5671  027566  116137  000004  001302            MOVB    4(R1),$TMP2     ;PUT IN $TMP2
5672  027574  042737  177400  001302            BIC     #177400,$TMP2   ;CLEAR HI BYTE
5673  027602  004737  031066                    JSR     PC,INRDY        ;WAIT FOR INRDY
5674  027606  104412                            ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5675  027610  021244                            021244
5676  027612  016104  000004                    MOV     4(R1),R4        ;PUT "FOUND" IN R4
5677  027616  042704  000376                    BIC     #376,R4         ;CLEAR UNWANTED BITS
5678  027622  012705  000001                    MOV     #1,R5           ;PUT "EXPECTED" IN R5
5679  027626  120504                            CMPB    R5,R4           ;IS IN BCC MATCH SET?
5680  027630  001401                            BEQ     25$
5681  027632  104015                            ERROR   15              ;IN BCC MATCH ERROR
5682  027634                            25$:
5683  027634  104412                            ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5684  027636  021204                            021204                  ;GET LAST HALF
5685  027640  116137  000004  001301            MOVB    4(R1),$TMP1+1   ;PUT IN $TMP1
```

```
5686  027646  042737  000377  001300          BIC     #377,$TMP1      ;CLEAR LO BYTE
5687  027654  053737  001300  001302          BIS     $TMP1,$TMP2     ;16 BIT BCC NOW IN $TMP2
5688  027662  023737  031230  001302          CMP     CALBCC,$TMP2    ;IS IT CORRECT?
5689  027670  001401                          BEQ     4$              ;BR IF OK
5690  027672  104027                          ERROR   27
5691  027674  012702  032016          4$:     MOV     #LTDAT,R2       ;RESET MESSAGE POINTER
5692  027700  005300                          DEC     R0              ;DECREMENT COUNTER
5693  027702  001307                          BNE     1$              ;BR IF NOT DONE
5694  027704  104420                  3$:     ADVANCE         ; ADVANCE TO NEXT TEST
5695
5696
5697                                          ;*************************** TEST 57 *************************
5698                                          ;*DDCMP CABLE DATA TEST
5699                                          ;*THIS TEST LOADS OUT SILO WITH THE FOLLOWING:
5700                                          ;*4 SYNCS,59 DATA CHARACTERS,EOM WITH GARBAGE CHARACTER
5701                                          ;*THE DATA IS TRANSMITTED OVER THE CABLE USING THE INTERNAL CLOCK
5702                                          ;*RECEIVED DATA IS VERIFIED AS IS IN BCC MATCH
5703                                          ;*LOOP-BACK CONNECTOR MUST BE ON TO RUN THIS TEST
5704                                          ;;*********************************************************************
5705
5706                                          ;  TEST 57
5707                                          ;-------------
5708                                  ;;*****************************************************************
5709  027706  000004                  TST57:  SCOPE
5710  027710  012737  000057  001202          MOV     #57,$TSTNM              ; LOAD THE NO. OF THIS TEST
5711  027716  012737  003662  001442          MOV     #$EOP,NEXT              ; POINT TO THE END OF PASS HANDLER.
5712                                                                  ;R1 CONTAINS BASE KMC11 ADDRESS
5713  027724  104410                          MSTCLR                  ;MASTER CLEAR KMC11
5714  027726  032737  040000  002050          BIT     #BIT14,STAT1    ;SKIP TEST IF NO
5715  027734  001533                          BEQ     3$              ;LOOPBACK CONNECTOR ON
5716  027736  012711  004000                  MOV     #BIT11,(R1)     ;SET LINE UNIT LOOP
5717  027742  004737  031374                  JSR     PC,SYNLD        ;LOAD 2 SYNCS
5718  027746  004737  031374                  JSR     PC,SYNLD        ;LOAD 2 MORE SYNCS
5719  027752  012737  120001  031226          MOV     #CRC16,XPOLY    ;LOAD POLYNOMIAL FOR SOFT CRC CALC
5720  027760  005037  030010                  CLR     6$              ;CLEAR OLD BCC
5721  027764  012703  000073                  MOV     #59.,R3         ;CHARACTER COUNT
5722  027770  012702  032012                  MOV     #MESDAT,R2      ;R2= POINTER
5723  027774  112237  030006          7$:     MOVB    (R2)+,5$        ;LOAD CHAR FOR SOFT BCC CALC.
5724  030000  004537  031122                  JSR     R5,SIMBCC       ;CALC SOFT BCC
5725  030004  000010                          10                      ;SHIFT COUNT
5726  030006  000000                  5$:     0                       ;CHARACTER
5727  030010  000000                  6$:     0                       ;OLD BCC
5728  030012  013737  031230  030010          MOV     CALBCC,6$       ;LOAD OLD BCC
5729  030020  005303                          DEC     R3              ;DEC COUNT
5730  030022  001364                          BNE     7$              ;BR IF NOT DONE YET
5731  030024  004537  031530                  JSR     R5,MESLD        ;LOAD SILO
5732  030030  032012                          MESDAT                  ;MESSAGE ADDRESS
5733  030032  000073                          59.                     ;CHARACTER COUNT
5734  030034  004737  031504                  JSR     PC,EOM          ;LOAD AN EOM
5735  030040  004737  030260                  JSR     PC,OCOR         ;WAIT FOR OCOR
5736  030044  005011                          CLR     (R1)            ;CLEAR LINE UNIT LOOP
5737  030046  012700  000073                  MOV     #59.,R0         ;R0= CHARACTER COUNT
5738  030052  012702  032012                  MOV     #MESDAT,R2      ;LOAD MESSAGE POINTER IN R2
5739  030056  004737  031066          1$:     JSR     PC,INRDY        ;WAIT FOR INRDY
5740  030062  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5741  030064  021204                          021204                  ;GET DATA FROM IN SILO
```

```
5742  030066  016104  000004              MOV     4(R1),R4        ;PUT CHARACTER IN "FOUND"
5743  030072  112205                      MOVB    (R2)+,R5        ;PUT "EXPECTED" IN R5
5744  030074  120504                      CMPB    R5,R4           ;IS RECEIVED DATA CORRECT
5745  030076  001401                      BEQ     2$              ;BR IF OK
5746  030100  104025                      ERROR   25              ;DATA ERROR
5747  030102                      2$:
5748  030102  005300                      DEC     R0              ;DECREMENT COUNTER
5749  030104  001364                      BNE     1$              ;BR IF NOT DONE
5750
5751                                      ;CHECK TO SEE THAT IN BCC MATCH IS SET
5752                                      ;AND THAT THE BCC WAS RECEIVED CORRECTLY
5753
5754  030106  004737  031066              JSR     PC,INRDY        ;WAIT FOR INRDY
5755  030112  104412                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5756  030114  021204                      021204                  ;GET FIRST HALF OF CRC
5757  030116  116137  000004  001302      MOVB    4(R1),$TMP2     ;PUT IN $TMP2
5758  030124  042737  177400  001302      BIC     #177400,$TMP2   ;CLEAR HI BYTE
5759  030132  004737  031066              JSR     PC,INRDY        ;WAIT FOR INRDY
5760  030136  104412                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5761  030140  021244                      021244
5762  030142  016104  000004              MOV     4(R1),R4        ;PUT "FOUND" IN R4
5763  030146  042704  000376              BIC     #376,R4         ;CLEAR UNWANTED BITS
5764  030152  012705  000001              MOV     #1,R5           ;PUT "EXPECTED" IN R5
5765  030156  120504                      CMPB    R5,R4           ;IS IN BCC MATCH SET?
5766  030160  001401                      BEQ     25$
5767  030162  104015                      ERROR   15              ;IN BCC MATCH ERROR
5768  030164                      25$:
5769  030164  104412                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5770  030166  021204                      021204                  ;GET LAST HALF
5771  030170  116137  000004  001301      MOVB    4(R1),$TMP1+1   ;PUT IN $TMP1
5772  030176  042737  000377  001300      BIC     #377,$TMP1      ;CLEAR LO BYTE
5773  030204  053737  001300  001302      BIS     $TMP1,$TMP2     ;16 BIT BCC NOW IN $TMP2
5774  030212  023737  031230  001302      CMP     CALBCC,$TMP2    ;IS IT CORRECT?
5775  030220  001401                      BEQ     3$              ;BR IF OK
5776  030222  104027                      ERROR   27
5777  030224  104420              3$:     ADVANCE         ; ADVANCE TO NEXT TEST
5778
5779
5780                                      ;SUBROUTINES
5781                                      ;-----------
5782
5783  030226                      GETSI:
5784                                      ;THIS SUBROUTINE READS LU 17, AND PUTS IT INTO NITCH.
5785                                      ;NITCH IS ROTATED LEFT UNTILL THE SI BIT IS IN CARRY
5786
5787  030226  104412                      ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5788  030230  021364                      021364                  ;PORT4_LU 17
5789  030232  017737  151636  030256      MOV     @KMP04,NITCH    ;STORE LU 17
5790  030240  106137  030256              ROLB    NITCH
5791  030244  106137  030256              ROLB    NITCH
5792  030250  106137  030256              ROLB    NITCH           ;PUT SI IN THE CARRY BIT
5793  030254  000207                      RTS     PC
5794  030256  000000              NITCH:  0
5795
5796
5797  030260                      OCOR:
```

```
5798                                            ;THIS SUBROUTINE SPINS ON OCOR
5799
5800  030260  104412                            ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5801  030262  021364                            021364                  ;PORT4 LU 17
5802  030264  032777  000020  151602            BIT     #BIT4,@KMP04    ;IS OCOR SET?
5803  030272  001772                            BEQ     OCOR            ;BR IF NO
5804  030274  000207                            RTS     PC              ;OK OCOR IS SET, GO BACK
5805
5806
5807  030276                          SYNC:
5808                                            ;THIS SUBROUNTINE LOADS THE SILO WITH THE NUMBER OF SYNC
5809                                            ;CHARACTERS PASSED TO IT IN THE WORD AFTER THE JSR CALL
5810                                            ;AND A NON-SYNC CHARACTER (301)
5811
5812  030276  013637  001276                    MOV     @(SP)+,$TMP0    ;GET COUNT
5813  030302  062746  000002                    ADD     #2,-(SP)        ;ADJUST STACK
5814  030306  012761  000026  000004            MOV     #26,4(R1)       ;LOAD PORT4
5815  030314  104412                            ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5816  030316  122114                            122114                  ;LOAD SYNC REGISTER
5817  030320  004737  030412          1$:       JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5818  030324  012761  000001  000004            MOV     #1,4(R1)        ;LOAD PORT4
5819  030332  104412                            ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5820  030334  122111                            122111                  ;SET SOM
5821  030336  012761  000026  000004            MOV     #26,4(R1)       ;LOAD PORT4
5822  030344  104412                            ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5823  030346  122110                            122110                  ;LOAD OUT DATA
5824  030350  005337  001276                    DEC     $TMP0           ;ALL DONE?
5825  030354  001361                            BNE     1$              ;BR IF NOT
5826  030356  004737  030412                    JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5827  030362  005061  000004                    CLR     4(R1)           ;LOAD PORT4
5828  030366  104412                            ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5829  030370  122111                            122111                  ;SET SOM
5830  030372  012761  000301  000004            MOV     #301,4(R1)      ;LOAD PORT4
5831  030400  104412                            ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5832  030402  122110                            122110                  ;LOAD OUT DATA
5833  030404  004737  030260                    JSR     PC,OCOR         ;WAIT FOR OCOR
5834  030410  000207                            RTS     PC
5835
5836
5837  030412                          OUTRDY:
5838                                            ;THIS SUBROUTINE SPINS ON OUT READY
5839
5840  030412  005037  001306                    CLR     $TMP4           ;CLEAR TIMER
5841  030416                          1$:
5842  030416  104412                            ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5843  030420  021224                            021224                  ;PORT4 LU11
5844  030422  032777  000020  151444            BIT     #BIT4,@KMP04    ;IS OUT RDY SET?
5845  030430  001004                            BNE     2$              ;BR IF YES
5846  030432  005237  001306                    INC     $TMP4           ;INC TIMER
5847  030436  001367                            BNE     1$              ;KEEP CHECKING IF NOT DONE
5848  030440  104036                            ERROR   36              ;ERROR, OUT READY NOT SET
5849  030442  000207                  2$:       RTS     PC
5850
5851
5852  030444                          CHAR:
5853                                            ;THIS SUBROUTINE LOADS THE SILO WITH 3 SYNCS
```

```
                                        ;AND THE CHARACTER PASSED TO IT.

030444  013637  001300                    MOV     @(SP)+,$TMP1    ;GET CHARACTER
030450  062746  000002                    ADD     #2,-(SP)        ;ADJUST STACK
030454  012737  000003  001276            MOV     #3,$TMPO        ;SET FOR 3 SYNCS
030462  012761  000026  000004            MOV     #26,4(R1)       ;LOAD PORT4
030470  104412                            ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030472  122114                            122114                  ;LOAD SYNC REGISTER
030474  004737  030412            1$:     JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
030500  012761  000001  000004            MOV     #1,4(R1)        ;LOAD PORT4
030506  104412                            ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030510  122111                            122111                  ;SET SOM
030512  012761  000026  000004            MOV     #26,4(R1)       ;LOAD PORT4
030520  104412                            ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030522  122110                            122110                  ;LOAD OUT DATA
030524  005337  001276                    DEC     $TMPO           ;ALL DONE?
030530  001361                            BNE     1$              ;BR IF NOT
030532  004737  030412                    JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
030536  013761  001300  000004            MOV     $TMP1,4(R1)     ;LOAD PORT4
030544  104412                            ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030546  122110                            122110                  ;LOAD OUT DATA
030550  004737  030260                    JSR     PC,OCOR         ;WAIT FOR OCOR
030554  000207                            RTS     PC

030556                          CHARSD:
                                        ;THIS SUBROUTINE LOADS THE SILO WITH THE CHARACTER PASSED TO IT.

030556  013637  001300                    MOV     @(SP)+,$TMP1    ;GET CHARACTER
030562  062746  000002                    ADD     #2,-(SP)        ;ADJUST STACK
030566  004737  030412                    JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
030572  013761  001300  000004            MOV     $TMP1,4(R1)     ;LOAD PORT4
030600  104412                            ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030602  122110                            122110                  ;LOAD OUT DATA
030604  004737  030412                    JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
030610  104412                            ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030612  122110                            122110                  ;LOAD GARBAGE CHAR
030614  004737  030260                    JSR     PC,OCOR         ;WAIT FOR OCOR
030620  000207                            RTS     PC

030622                          SILOLD:
                                        ;THIS SUBROUTINE FILLS THE OUT SILO
                                        ; WITH A BINARY COUNT PATTERN

030622  012737  000073  001300            MOV     #73,$TMP1       ;LOAD COUNT
030630  005737  031062                    TST     SCHAR           ;FIRST TIME HERE?
030634  100470                            BMI     4$              ;BR IF BITSTUFF
030636  001032                            BNE     2$              ;BR IF NO
030640  062737  000002  001300            ADD     #2,$TMP1        ;ADD 2 TO CHARACTER COUNT
030646  012737  000003  001276            MOV     #3,$TMPO        ;SET FOR 3 SYNCS
030654  012761  000026  000004            MOV     #26,4(R1)       ;LOAD PORT4
030662  104412                            ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
030664  122114                            122114                  ;LOAD SYNC REGISTER
030666  004737  030412            1$:     JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
030672  012761  000001  000004            MOV     #1,4(R1)        ;LOAD PORT4
```

```
5910  030700  104412                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5911  030702  122111                        122111                  ;SET SOM
5912  030704  012761  000026  000004        MOV     #26,4(R1)       ;LOAD PORT4
5913  030712  104412                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5914  030714  122110                        122110                  ;LOAD OUT DATA
5915  030716  005337  001276                DEC     $TMP0           ;ALL DONE?
5916  030722  001361                        BNE     1$              ;BR IF NOT
5917  030724  004737  030412        2$:     JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
5918  030730  013761  031062  000004        MOV     SCHAR,4(R1)     ;LOAD PORT4
5919  030736  104412                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5920  030740  122110                        122110                  ;LOAD OUT DATA
5921  030742  005737  031064                TST     STUFLG          ;BITSTUFF???
5922  030746  001407                        BEQ     6$              ;BR IF NO
5923  030750  013737  031062  030762        MOV     SCHAR,5$        ;IT IS SDLD SO CHECK BITSTUFFING
5924  030756  004537  031612                JSR     R5,STFFCL       ;ADD ANY BIT STUFF CLOCK TICKS
5925  030762  000000                5$:     0                       ;CHARACTER
5926  030764  000010                        10                      ;CHIFT COUNT
5927  030766  005237  031062        6$:     INC     SCHAR           ;NEXT CHARACTER
5928  030772  022737  000400  031062        CMP     #400,SCHAR      ;ALL DONE?
5929  031000  001403                        BEQ     3$
5930  031002  005337  001300                DEC     $TMP1           ;DECREMENT COUNT
5931  031006  001346                        BNE     2$              ;BR IF NOT DONE
5932  031010  004737  030260        3$:     JSR     PC,OCOR         ;WAIT FOR OCOR
5933  031014  000207                        RTS     PC
5934  031016  005037  031062        4$:     CLR     SCHAR           ;START PATTERN AT ZERO
5935  031022  012737  177777  031064        MOV     #-1,STUFLG      ;SET BITSTUFF FLAG
5936  031030  005037  032010                CLR     BITCON          ;CLEAR STUFF COUNT
5937  031034  062737  000002  001300        ADD     #2,$TMP1        ;ADD 2 TO CHARACTER COUNT
5938  031042  012761  000001  000004        MOV     #1,4(R1)        ;SET BIT0 IN PORT4
5939  031050  104412                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5940  031052  122111                        122111                  ;SET SOM!
5941  031054  104412                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5942  031056  122110                        122110                  ;LOAD GARBAGE CHAR
5943  031060  000721                        BR      2$              ;GO LOAD SILO
5944  031062  000000                SCHAR:  0
5945  031064  000000                STUFLG: 0
5946
5947
5948  031066                        INRDY:
5949                                        ;THIS SUBROUTINE SPINS ON INRDY
5950                                        ;IF INRDY FAILS TO SET THE DELAY TIMES OUT AND AN
5951                                        ;ERROR IS REPORTED. FOR BETTER SCOPE LOOPS THIS
5952                                        ;DELAY CAN BE MADE SHORTER BY ALTERING THE NUMBER
5953                                        ;INITIALLY LOADED INTO $TMP0, THE SMALLER THE NUMBER
5954                                        ;THE SHORTER THE DELAY. 0 IS THE LONGEST DELAY.
5955
5956  031066  012737  000000  001276        MOV     #0,$TMP0        ;SET UP DELAY COUNTER
5957  031074                        1$:
5958  031074  104412                        ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
5959  031076  021244                        021244                  ;PORT4 LU12
5960  031100  032777  000020  150766        BIT     #BIT4,@KMP04    ;IS INRDY SET?
5961  031106  001004                        BNE     2$              ;BR IF YES
5962  031110  005237  001276                INC     $TMP0           ;INC DELAY
5963  031114  001367                        BNE     1$              ;TRY AGAIN
5964  031116  104037                        ERROR   37              ;ERROR,NO INRDY
5965  031120  000207                2$:     RTS     PC              ;RETURN
```

```
5966
5967
5968  031122                                  SIMBCC:
5969                                                  ;THIS SUBROUTINE CALCULATES THE CRC USING POLYNOMIAL GIVEN
5970                                                  ;IN XPOLY. THE CORRECT CRC IS $LPADRED IN CALBCC, AND THE
5971                                                  ;STATE OF THE LSB OF THE BCC IS $LPADRED IN THE C BIT.
5972
5973  031122  010046                                  MOV     R0,-(SP)        ;SAVE R0 ON STACK
5974  031124  012537  001276                         MOV     (R5)+,$TMP0     ;$TMP0 = SHIFT COUNT
5975  031130  012537  001300                         MOV     (R5)+,$TMP1     ;$TMP1 = CHARACTER
5976  031134  012537  031230                         MOV     (R5)+,CALBCC    ;CALBCC = OLD BCC
5977  031140  013700  031230              1$:        MOV     CALBCC,R0       ;PUT OLD BCC IN R0
5978  031144  000241                                  CLC
5979  031146  006037  031230                         ROR     CALBCC          ;SHIFT OLD BCC
5980  031152  006037  001300                         ROR     $TMP1           ;SHIFT CHARACTER
5981  031156  005500                                  ADC     R0              ;ADD CHAR CARRY TO OLD BCC
5982  031160  006000                                  ROR     R0              ;PUT BIT0 TO CARRY BIT
5983  031162  103011                                  BCC     2$              ;CARRY IS FEEDBACK BIT
5984  031164  013700  031226                         MOV     XPOLY,R0        ;IF FEEDBACK = 1
5985  031170  043700  031230                         BIC     CALBCC,R0       ;EXCLUSIVLY OR XPOLY TO CALBCC
5986  031174  043737  031226  031230                 BIC     XPOLY,CALBCC
5987  031202  050037  031230                         BIS     R0,CALBCC
5988  031206  005337  001276              2$:        DEC     $TMP0           ;DEC SHIFT COUNT
5989  031212  001352                                  BNE     1$              ;BR IF NOT DONE
5990  031214  013700  031230                         MOV     CALBCC,R0       ;PUT RESULT IN R0
5991  031220  006000                                  ROR     R0              ;SHIFT BIT0 TO CARRY
5992  031222  012600                                  MOV     (SP)+,R0        ;RESTORE R0
5993  031224  000205                                  RTS     R5              ;$LPADR
5994  031226  000000                          XPOLY:  0
5995  031230  000000                          CALBCC: 0
5996           000200                          LRC8=200
5997           120001                          CRC16=120001
5998           102010                          CRC.CCITT=102010
5999
6000
6001  031232                                  BCCLD:
6002                                                  ;THIS SUBROUTINE LOADS THE OUT SILO WITH 2 SYNCS
6003                                                  ;WITH SOM SET, AND ONE CHARACTER PASSED TO IT
6004                                                  ;WITH THE SOM BIT CLEAR (ENABLE CRC)
6005
6006  031232  013637  001300                         MOV     @(SP)+,$TMP1    ;GET CHARACTER
6007  031236  062746  000002                         ADD     #2,-(SP)        ;ADJUST STACK
6008  031242  012737  000002  001276                 MOV     #2,$TMP0        ;SET FOR 2 SYNCS
6009  031250  012761  000026  000004                 MOV     #26,4(R1)       ;LOAD PORT4
6010  031256  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
6011  031260  122114                                  122114                  ;LOAD SYNC REGISTER
6012  031262  004737  030412              1$:        JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
6013  031266  012761  000001  000004                 MOV     #1,4(R1)        ;LOAD PORT4
6014  031274  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
6015  031276  122111                                  122111                  ;SET SOM
6016  031300  012761  000026  000004                 MOV     #26,4(R1)       ;LOAD PORT4
6017  031306  104412                                  ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
6018  031310  122110                                  122110                  ;LOAD OUT DATA
6019  031312  005337  001276                         DEC     $TMP0           ;ALL DONE?
6020  031316  001361                                  BNE     1$              ;BR IF NOT
6021  031320  004737  030412                         JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
```

```
 6022  031324  013761  001300  000004          MOV     $TMP1,4(R1)     ;LOAD PORT4
 6023  031332  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=53C4
 6024  031334  122110                          122110                  ;LOAD OUT DATA
 6025  031336  004737  030260                  JSR     PC,OCOR         ;WAIT FOR OCOR
 6026  031342  000207                          RTS     PC
 6027
 6028
 6029  031344                          GETQO:
 6030                                          ;THIS SUBROUTINE READS THE STATE OF THE TRANSMIT
 6031                                          ;BCC LSB AND PUTS IT IN THE CARRY BIT
 6032
 6033  031344  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 6034  031346  021364                          021364                  ;PORT4_LU-17
 6035  031350  106177  150520                  ROLB    @KMP04          ;PUT QO IN CARRY
 6036  031354  000207                          RTS     PC              ;RETURN
 6037
 6038
 6039  031356                          GETQI:
 6040                                          ;THIS SUBROUTINE READS THE STATE OF THE RECEIVE
 6041                                          ;BCC LSB AND PUTS IT IN THE CARRY BIT
 6042
 6043  031356  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 6044  031360  021364                          021364                  ;PORT4_LU-17
 6045  031362  106177  150506                  ROLB    @KMP04          ;PUT QO IN CARRY
 6046  031366  106177  150502                  ROLB    @KMP04          ;PUT QI IN CARRY
 6047  031372  000207                          RTS     PC              ;RETURN
 6048
 6049
 6050  031374                          SYNLD:
 6051                                          ;THIS SUBROUTINE LOADS OUT SILO WITH
 6052                                          ;2 SYNC CHARACTERS WITH SOM SET
 6053
 6054  031374  012737  000002  001276          MOV     #2,$TMP0        ;LOAD COUNTER FOR 2 SYNCS
 6055  031402  012761  000026  000004          MOV     #26,4(R1)       ;PORT4_26
 6056  031410  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 6057  031412  122114                          122114                  ;LOAD SYNC REG
 6058  031414  004737  030412          1$:     JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
 6059  031420  012761  000001  000004          MOV     #1,4(R1)        ;LOAD PORT4
 6060  031426  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 6061  031430  122111                          122111                  ;SET SOM
 6062  031432  012761  000026  000004          MOV     #26,4(R1)       ;PORT_26
 6063  031440  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 6064  031442  122110                          122110                  ;LOAD OUT DATA WITH SYNC
 6065  031444  005337  001276                  DEC     $TMP0           ;DECREMENT COUNTER
 6066  031450  001361                          BNE     1$              ;BR IF NOT DONE
 6067  031452  000207                          RTS     PC              ;RETURN
 6068
 6069
 6070  031454                          SOM:
 6071                                          ;THIS SUBROUTINE LOADS SOM AND OUT DATA WITH A
 6072                                          ;GARBAGE CHARACTER (0)
 6073
 6074  031454  004737  030412                  JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
 6075  031460  012761  000001  000004          MOV     #1,4(R1)        ;PORT4_1
 6076  031466  104412                          ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 6077  031470  122111                          122111                  ;SET SOM
```

```
 6078  031472  005061  000004            CLR     4(R1)           ;CLEAR DATA CHAR
 6079  031476  104412                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 6080  031500  122110                    122110                  ;LOAD GARBAGE CHARACTER
 6081  031502  000207                    RTS     PC              ;RETURN
 6082
 6083
 6084  031504                    EOM:
 6085                                    ;THIS SUBROUTINE LOADS EOM AND OUT DATA WITH A
 6086                                    ;GARBAGE CHARACTER (2) TO ENABLE TRANSMISSION OF BCC
 6087
 6088  031504  004737  030412            JSR     PC,OUTRDY       ;WAIT FOR OUTRDY
 6089  031510  012761  000002  000004    MOV     #2,4(R1)        ;PORT4 2
 6090  031516  104412                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 6091  031520  122111                    122111                  ;SET EOM
 6092  031522  104412                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 6093  031524  122110                    122110                  ;LOAD GARBAGE CHARACTER
 6094  031526  000207                    RTS     PC              ;RETURN
 6095
 6096
 6097  031530                    MESLD:
 6098                                    ;THIS SUBROUTINE LOADS SILO WITH MESSAGE
 6099                                    ;THE FIRST ARUGUMENT IS THE ADDRESS OF THE MESSAGE
 6100                                    ;THE SECOND ARGUMENT IS THE NUMBER OF CHARACTERS IN THE MESSAGE
 6101
 6102  031530  010046                    MOV     R0,-(SP)        ;SAVE R0
 6103  031532  012500                    MOV     (R5)+,R0        ;R0=MESSAGE POINTER
 6104  031534  012537  001276            MOV     (R5)+,$TMP0     ;$TMP0=CHARACTER COUNT
 6105  031540  004737  030412    1$:     JSR     PC,OUTRDY       ;WAIT FOR OUT RDY
 6106  031544  112061  000004            MOVB    (R0)+,4(R1)     ;LOAD PORT4 WITH CHARACTER
 6107  031550  104412                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 6108  031552  122110                    122110                  ;LOAD OUT DATA SILO
 6109  031554  005337  001276            DEC     $TMP0           ;DEC CHAR COUNT
 6110  031560  001367                    BNE     1$              ;BR IF NOT DONE
 6111  031562  004737  030260            JSR     PC,OCOR         ;WAIT FOR OCOR
 6112  031566  012600                    MOV     (SP)+,R0        ;RESTORE R0
 6113  031570  000205                    RTS     R5              ;RETURN
 6114
 6115
 6116  031572                    CLRIO:
 6117                                    ;THIS SUBROUTINE SETS IN CLR AND OUT CLR TO
 6118                                    ;CLEAR THE TRANSMIT AND RECEIVE BCC REGISTERS
 6119
 6120  031572  012761  000200  000004    MOV     #BIT7,4(R1)     ;LOAD PORT4
 6121  031600  104412                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 6122  031602  122112                    122112                  ;SET IN CLR!
 6123  031604  104412                    ROMCLK                  ;NEXT WORD IS INSTRUCTION, ROMCLK PC=5304
 6124  031606  122111                    122111                  ;SET OUT CLR!
 6125  031610  000207                    RTS     PC              ;RETURN
 6126
 6127
 6128  031612                    STFFCL:
 6129                                    ;THIS SUBROUTINE ADDS ANY NECESSSARY BIT STUFF CLOCK TICKS
 6130                                    ;FIRST ARGUMENT IS CHAR, SECOND ARGUMENT IS SHIFT COUNT.
 6131
 6132  031612  010046                    MOV     R0,-(SP)        ;SAVE R0
 6133  031614  012500                    MOV     (R5)+,R0        ;PUT CHAR IN R0
```

```
6134  031616  012537  001302          MOV     (R5)+,$TMP2     ;PUT SHIFT COUNT IN $TMP2
6135  031622  106000          1$:     RORB    R0              ;LOOK AT NEXT BIT
6136  031624  103403                  BCS     2$              ;BR IF A MARK
6137  031626  005037  032010          CLR     BITCON          ;IT WAS A SPACE, CLEAR 1'S COUNTER
6138  031632  000412                  BR      3$              ;CONTINUE
6139  031634  005237  032010  2$:     INC     BITCON          ;INC CONSECUTIVE 1'S COUNTER
6140  031640  022737  000005  032010  CMP     #5,BITCON       ;IS IT 5 YET?
6141  031646  001004                  BNE     3$              ;BR IF NO
6142  031650  005037  032010          CLR     BITCON          ;YES!  SO START AGAIN
6143  031654  104413  000001          DATACLK,        1       ;GIVE EXTRA TICK TO STUFF ZERO
6144  031660  005337  001302  3$:     DEC     $TMP2           ;DEC SHIFT COUNT
6145  031664  001356                  BNE     1$              ;BR IF NOT DONE
6146  031666  012600                  MOV     (SP)+,R0        ;RESTORE R0
6147  031670  000205                  RTS     R5              ;RETURN
6148
6149
6150  031672          STFFCK:
6151                  ;THIS SUBROUTINE CHECKS TO SEE IF TRANSMITTER
6152                  ;IS STUFFING ZEROS WHEN IT SHOULD. FIRST ARGUMENT
6153                  ;IS THE CHARACTER, SECOND ARGUMENT IS SHIFT COUNT.
6154
6155  031672  010046                  MOV     R0,-(SP)        ;SAVE R0
6156  031674  012500                  MOV     (R5)+,R0        ;PUT CHAR IN R0
6157  031676  012537  001302          MOV     (R5)+,$TMP2     ;PUT SHIFT COUNT IN $TMP2
6158  031702  106000          1$:     RORB    R0              ;SHIFT OUT NEXT BIT
6159  031704  103403                  BCS     2$              ;BR IF IT IS A MARK
6160  031706  005037  032010          CLR     BITCON          ;IT WAS A SPACE, CLEAR 1'S COUNTER
6161  031712  000416                  BR      3$              ;CONTINUE
6162  031714  005237  032010  2$:     INC     BITCON          ;INC CONSECUTIVE I'S COUNTER
6163  031720  022737  000005  032010  CMP     #5,BITCON       ;5 IN A ROW YET?
6164  031726  001010                  BNE     3$              ;BR IF NO
6165  031730  005037  032010          CLR     BITCON          ;YES, SO START OVER
6166  031734  104413  000001          DATACLK,        1       ;EXTRA TICK TO STUFF ZERO
6167  031740  004737  030226          JSR     PC,GETSI        ;LOOK AT WINDOW
6168  031744  103001                  BCC     3$              ;IS IT A ZERO, BR IF YES
6169  031746  104030                  ERROR   30              ;NO. ERROR ZERO WAS NOT STUFFED
6170  031750  005337  001302  3$:     DEC     $TMP2           ;DEC SHIFT COUNT
6171  031754  001352                  BNE     1$              ;BR IF NOT DONE
6172  031756  012600                  MOV     (SP)+,R0        ;RESTORE R0
6173  031760  000205                  RTS     R5              ;RETURN
6174
6175
6176  031762          CTSDLY:
6177                  ;THIS SUBROUTINE WASTES TIME UNTIL CTS SETS,
6178                  ;BUT HOPEFULLY NOT SO LONG THAT THE SILO RUNS OUT
6179
6180  031762  010046                  MOV     R0,-(SP)        ;SAVE R0
6181  031764  012700  000032          MOV     #32,R0          ;LOAD R0 WITH COUNT
6182  031770  027777  147250  147246  1$:     CMP     @$TKS,@$TKS     ;WASTE TIME
6183  031776  005300                  DEC     R0              ;DECREMENT COUNTER
6184  032000  001373                  BNE     1$              ;DO IT AGAIN IF NOT = 0
6185  032002  012600                  MOV     (SP)+,R0        ;RESTORE R0
6186  032004  000207                  RTS     PC              ;RETURN
6187
6188
6189  032006  000176          FLAG:   ^B<01111110>            ;FLAG CHARACTER
```

```
 6190  032010  000000                          BITCON: 0
 6191  032012     000      125      252  MESDAT: .BYTE   0,125,252,377
 6192  032015     377
 6193  032016     001      002      004  FLTDAT: .BYTE   1,2,4,10,20,40,100,200,376,375,373,367,357,337,277,177
 6194  032021     010      020      040
 6195  032024     100      200      376
 6196  032027     375      373      367
 6197  032032     357      337      277
 6198  032035     177
 6199  032036     100      140      160  STUFDT: .BYTE   100,140,160,170,3,300,174,176,177,1
 6200  032041     170      003      300
 6201  032044     174      176      177
 6202  032047     001
 6203  032050     363      347      317          .BYTE   363,347,317,200,0,377,377,377,200,37
 6204  032053     200      000      377
 6205  032056     377      377      200
 6206  032061     037
 6207                                     .EVEN
 6208  032062  046200  047111  020105  EM1:    .ASCIZ  <200>/LINE UNIT INITALIZATION TEST/
       032120  046200  047111  020105  EM2:    .ASCIZ  <200>^LINE UNIT REGISTER READ/ONLY TEST^
       032163     200  044514  042516  EM3:    .ASCIZ  <200>^LINE UNIT REGISTER WRITE/READ TEST^
       032227     200  044514  042516  EM4:    .ASCIZ  <200>/LINE UNIT INTERNAL CLOCK FAILURE/
       032271     200  051124  047101  EM5:    .ASCIZ  <200>/TRANSMITTER DATA ERROR/
       032321     200  042522  042503  EM6:    .ASCIZ  <200>/RECEIVER TEST/
       032340  051200  041505  044505  EM7:    .ASCIZ  <200>/RECEIVER DATA ERROR/
       032365                           EM10:
       032365     200  047515  042504          .ASCII  <200>/MODEM SIGNAL ERROR/
       032410  052200  044510  020123          .ASCII  <200>/THIS ERROR COULD BE CAUSED IF YOU HAVE V.35 AND /
       032471     200  052501  047524          .ASCIZ  <200>/AUTOSIZED. IF V.35, MANUALLY ANSWER QUESTIONS/
       032550  052200  040522  051516  EM11:   .ASCIZ  <200>/TRANSMITTER CRC ERROR/
       032577     200  042522  042503  EM12:   .ASCIZ  <200>/RECEIVER CRC ERROR/
       032623     200  047111  041040  EM13:   .ASCIZ  <200>/IN BCC MATCH ERROR (LU REG 12)/
       032663     200  051124  047101  EM14:   .ASCIZ  <200>/TRANSMITTER FAILED TO GO TO MARK STATE/
       032733     200  040503  046102  EM15:   .ASCIZ  <200>/CABLE DATA TEST/
       032754  043200  040514  020107  EM16:   .ASCIZ  <200>/FLAG ERROR/
       032770  052200  040522  051516  EM17:   .ASCIZ  <200>/TRANSMITTER FAILED TO STUFF A ZERO/
       033034  051600  044527  041524  EM20:   .ASCIZ  <200>/SWITCH PAC TEST/
       033055     200  041101  051117  EM21:   .ASCIZ  <200>/ABORT ERROR/
       033072  052200  040522  051516  EM22:   .ASCIZ  <200>/TRANSMITTER ERROR/
       033115     200  040510  043114  EM23:   .ASCIZ  <200>/HALF DUPLEX TEST/
       033137     200  052517  020124  EM24:   .ASCIZ  <200>/OUT READY NOT SET/
       033162  044600  020116  042522  EM25:   .ASCIZ  <200>/IN READY NOT SET/

       033204  042600  050130  041505  DH1:    .ASCIZ  <200>/EXPECTED  FOUND/
       033225     200  054105  042520  DH2:    .ASCIZ  <200>/EXPECTED  FOUND  LU-REGISTER/
       033263     200  044103  051101  DH3:    .ASCIZ  <200>/CHARACTER    BIT THAT FAILED/
       033321     200  047503  051122  DH4:    .ASCIZ  <200>/CORRECT CRC    BIT THAT FAILED/
       033361     200  054105  042520  DH5:    .ASCIZ  <200>/EXPECTED   FOUND   SHIFT/
       033413     200  054105  042520  DH6:    .ASCIZ  <200>/EXPECTED   FOUND   CHARACTER   SHIFT/
       033461     200  046102  041517  DH7:    .ASCIZ  <200>/BLOCK END NOT SET/
       033504  051200  051524  042040  DH10:   .ASCIZ  <200>/RTS DID NOT CLEAR/
               033530                   .EVEN

       033530  000002                   DT1:    2
       033532     003      007                  .BYTE   3,7
       033534  001274                           $REG5
```

```
033536     003     002                  .BYTE   3,2
033540  001272                          $REG4
033542  000003                  DT2:    3
033544     003     007                  .BYTE   3,7
033546  001274                          $REG5
033550     003     010                  .BYTE   3,10
033552  001272                          $REG4
033554     003     002                  .BYTE   3,2
033556  001266                          $REG2
033560  000002                  DT3:    2
033562     003     017                  .BYTE   3,17
033564  001274                          $REG5
033566     002     002                  .BYTE   2,2
033570  001270                          $REG3
033572  000002                  DT4:    2
033574     006     021                  .BYTE   6,21
033576  031230                          CALBCC
033600     002     002                  .BYTE   2,2
033602  001270                          $REG3
033604  000003                  DT5:    3
033606     001     011                  .BYTE   1,11
033610  001462                          ZERO
033612     001     011                  .BYTE   1,11
033614  001464                          ONE
033616     002     002                  .BYTE   2,2
033620  001262                          $REG0
033622  000003                  DT6:    3
033624     001     011                  .BYTE   1,11
033626  001464                          ONE
033630     001     011                  .BYTE   1,11
033632  001462                          ZERO
033634     002     002                  .BYTE   2,2
033636  001262                          $REG0
033640  000004                  DT7:    4
033642     001     011                  .BYTE   1,11
033644  001462                          ZERO
033646     001     011                  .BYTE   1,11
033650  001464                          ONE
033652     003     007                  .BYTE   3,7
033654  001274                          $REG5
033656     002     001                  .BYTE   2,1
033660  001270                          $REG3
033662  000004                  DT10:   4
033664     001     011                  .BYTE   1,11
033666  001464                          ONE
033670     001     011                  .BYTE   1,11
033672  001462                          ZERO
033674     003     007                  .BYTE   3,7
033676  001274                          $REG5
033700     002     001                  .BYTE   2,1
033702  001270                          $REG3
033704  000002                  DT11:   2
033706     003     007                  .BYTE   3,7
033710  032006                          FLAG
033712     002     002                  .BYTE   2,2
033714  001270                          $REG3
```

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CZKCE.P11    08-JUL-80 08:24          SUBROUTINES                    SEQ 0121

        033716  000002                  DT12:   2
        033720     006      004                 .BYTE   6,4
        033722  031230                         CALBCC
        033724     006      002                 .BYTE   6,2
        033726  001302                         $TMP2


        033730                          CORMAX:
                000001                  .END
```

```
ABASE = 000000            951     992
ACDW1 = 000000            951     994
ACDW2 = 000000            951     995
ACPUOP= 000000            951     966
ADDW0 = 000000            951     996
ADDW1 = 000000            951     997
ADDW10= 000000            951    1006
ADDW11= 000000            951    1007
ADDW12= 000000            951    1008
ADDW13= 000000            951    1009
ADDW14= 000000            951    1010
ADDW15= 000000            951    1011
ADDW2 = 000000            951     998
ADDW3 = 000000            951     999
ADDW4 = 000000            951    1000
ADDW5 = 000000            951    1001
ADDW6 = 000000            951    1002
ADDW7 = 000000            951    1003
ADDW8 = 000000            951    1004
ADDW9 = 000000            951    1005
ADEVCT= 000000            951     957
ADEVM = 000000            951     993
ADRCNT  006057           2098*   2113*   2122#
ADVANC= 104420           2267#   5694    5777
AENV  = 000002              1#    951     962
AENVM = 000000            951     963
AFATAL= 000000            951     954
AMADR1= 000000            951     979
AMADR2= 000000            951     983
AMADR3= 000000            951     986
AMADR4= 000000            951     989
AMAMS1= 000000            951     973
AMAMS2= 000000            951     981
AMAMS3= 000000            951     984
AMAMS4= 000000            951     987
AMSGAD= 000000            951     959
AMSGLG= 000000            951     960
AMSGTY= 000000            951     953
AMTYP1= 000000            951     974
AMTYP2= 000000            951     982
AMTYP3= 000000            951     985
AMTYP4= 000000            951     988
APASS = 000000            951     956
APRIOR= 000000            951
APTCSU= 000040           1823    1928#
APTENV= 000001           1816    1884    1926#   2328
APTSIZ= 000200           1925#
APTSPO= 000100           1818    1886    1927#
APT.SI  013716           1491    2927#
ASWREG= 000000            951     964
ATESTN= 000000            951     955
AUDONE  003354           1528    1549    1588#
AUNIT = 000000            951     958
AUSTRT  003126           1527#
AUSWR = 000000            951     965
AUTO.S  012236           1489    2646#
```

```
AVECT1= 000000   951   990
AVECT2= 000000   951   991
BASE    014134  2938* 2949  2963* 2973#
BCCLD   031232  4385  4414  4462  4491  4539  4568  4616  4645  6001#
BINWRD  006412  2170* 2173* 2174  2211#
BITCON  032010  5936* 6137* 6139* 6140  6142* 6160* 6162* 6163  6165* 6190#
BIT0  = 000001   814# 2435  2436
BIT00 = 000001   804#  814
BIT01 = 000002   803#  813
BIT02 = 000004   802#  812
BIT03 = 000010   801#  811
BIT04 = 000020   800#  810
BIT05 = 000040   799#  809
BIT06 = 000100   798#  808
BIT07 = 000200   797#  807
BIT08 = 000400   796#  806
BIT09 = 001000   795#  805
BIT1  = 000002   813# 1496  2429  2435  2436  2808
BIT10 = 002000   794# 2789
BIT11 = 004000   793# 1759  3381  3415  3460  3519  3572  3625  3678  3732  3792  3822  3852
                3882  3914  3964  4003  4042  4081  4123  4208  4325  4379  4456  4533  4610
                4685  4753  4826  4925  4991  5240  5513  5578  5620  5716
BIT12 = 010000   792# 2720  2806
BIT13 = 020000   791# 2723  2735  2792  2810  3075  4254  4268  4291  4321  4350
BIT14 = 040000   790# 1741  2734  2759  2810  2821  4256  4323  5618  5714
BIT15 = 100000   789# 1436
BIT2  = 000004   812# 1496  1637  2436  2745  2755  4272  4294  4345
BIT3  = 000010   811# 2812  2819  4293
BIT4  = 000020   810# 2419  2442  2444  3496  3923  3973  4012  4051  4090  5579  5802  5844
                5960
BIT5  = 000040   809# 2924  3078  3438  3550  3603  3656  3709  4167  5530
BIT6  = 000100   808# 2424  2425  2814  3831  3891
BIT7  = 000200   807# 2425  2544  2924  3468  3928  4270  4275  4296  4348  4352  6120
BIT8  = 000400   806# 2801  2803  2816  2818  2824  2827  2884
BIT9  = 001000   805# 2798  2824  2827  2882  2884
BM      010757  2467# 2770
BPTVEC= 000014   821#
BRLVL   013650  2879  2889  2897  2910#
BRW     004360  1642  1776#
CALBCC  031230  4404  4433  4481  4510  4558  4587  4635  4664  4722  4790  4851  4872  5020
                5041  5071  5092  5168  5211  5270  5291  5340  5361  5437  5491  5632  5688
                5728  5774  5976* 5977  5979* 5985  5986* 5987* 5990  5995# 6208
CHAR    030444  3915  3965  4004  4043  4082  4209  5852#
CHARSD  030556  5879#
CHRCNT  006410  2168* 2171  2175  2191* 2209#  2210
CKSWR   011340  1467  1782  2274  2492#
CKSWR1  011414  2504# 2516
CKSWR2  011426  2507#
CKSWR3  011432  2509#
CKSWR4  011436  2510# 2518  2525
CKSWR5  011542  2493  2495  2499  2534#
CLKX    001452  1026#
CLRIO   031572  4380  4409  4457  4486  4534  4563  4611  4640  6116#
CNERR   011155  1561  2467#
CNT.MA  002302  1040  1313# 1435  1437  1439  2572
CNVRT = 104417  1558  1667  1669  1671  1673  2266# 2309  2311  2386  2507
```

```
CONERR  011110          1556    2467#
CONN    011017          2467#   2725
CONTAB  003330          1565    1573#
CONVRT= 104416          1508    1564    2265#   2325    2668
CORMAX  033730          6208#
CR    = 000015           729#   1862    1872
CRC.CC= 102010          5998#
CRC16 = 120001          4382    4411    4459    4488    4536    4565    4613    4642    4690    4758    4845    5014    5065
                        5264    5334    5623    5719    5997#
CREAM   001502          1039#   1434*   2568*   2569    2571*   2575
CRLF  = 000200           730#   1833    1872
CSR     010364          2467#   2672
CSRMAP  012240          2648#
CTSDLY  031762          6176#
CYCLE   011606          1643    1704    2559#
DATABP  006764          2298*   2301    2323    2326#
DATACL= 104413          2262#   3422    3467    3471    3532    3533    3547    3585    3586    3600    3638    3639    3653
                        3691    3692    3706    3750    3753    3796    3826    3856    3886    3917    3967    4006    4045
                        4084    4125    4126    4171    4172    4211    4387    4388    4416    4417    4464    4465    4493
                        4494    4541    4542    4570    4571    4618    4619    4647    4648    4704    4706    4772    4774
                        4838    4852    4873    4891    4898    4900    4935    5007    5021    5042    5072    5093    5111
                        5118    5120    5131    5257    5271    5292    5312    5341    5362    5380    5387    5389    5400
                        5522    5527    5533    5588    6143    6166
DATAHD  006752          2297*   2319    2322#
DDISP = 177570           736#    892#    921
DELAY = 104411          2260#
DEVTAB  003342          1531    1578#
DH1     033204          1089    1092    1095    1131    1137    1143    1170    6208#
DH10    033504          1152    6208#
DH2     033225          1071    1074    1077    1083    1155    1164    6208#
DH3     033263          1086    1134    1149    6208#
DH4     033321          1104    6208#
DH5     033361          1098    1101    1110    1113    1167    6208#
DH6     033413          1116    1119    1122    1125    6208#
DH7     033461          1146    6208#
DISPLA  001242           921#   1453*   1459*   1771*
DISPRE  000174           882#   1459
DSWR  = 177570           735#    891#    920
DT1     033530          1090    1093    1096    1132    1144    1171    6208#
DT10    033662          1120    1126    6208#
DT11    033704          1135    6208#
DT12    033716          1138    6208#
DT2     033542          1072    1075    1078    1084    1156    1165    6208#
DT3     033560          1087    1150    6208#
DT4     033572          1105    6208#
DT5     033604          1099    1102    1168    6208#
DT6     033622          1111    1114    6208#
DT7     033640          1117    1123    6208#
DZDME = 000000          1067
DZDMG = ****** U        1067    1172
FMTVEC= 000030           824#
EM1     032062          1070    6208#
EM10    032365          1094    6208#
EM11    032550          1097    1103    1109    1115    1118    6208#
EM12    032577          1100    1112    1121    1124    1136    6208#
EM13    032623          1106    1169    6208#
```

```
EM14    032663          1127    6208#
EM15    032733          1130    6208#
EM16    032754          1133    6208#
EM17    032770          1139    6208#
EM2     032120          1073    6208#
EM20    033034          1142    6208#
EM21    033055          1145    1148    6208#
EM22    033072          1151    6208#
EM23    033115          1154    6208#
EM24    033137          1157    6208#
EM25    033162          1160    6208#
EM3     032163          1076    6208#
EM4     032227          1079    6208#
EM5     032271          1082    1085    1166    6208#
EM6     032321          1088    1163    6208#
EM7     032340          1091    6208#
EOM     031504          4835    4933    5000    5004    5249    5254    5638    5642    5646    5734    6084#
ERCT00  002304          1315#
ERCT01  002310          1318#
ERCT02  002314          1321#
ERCT03  002320          1324#
ERCT04  002324          1327#
ERCT05  002330          1330#
ERCT06  002334          1333#
ERCT07  002340          1336#
ERCT10  002344          1339#
ERCT11  002350          1342#
ERCT12  002354          1345#
ERCT13  002360          1348#
ERCT14  002364          1351#
ERCT15  002370          1354#
ERCT16  002374          1357#
ERCT17  002400          1360#
ERR     003244          1540    1553#   1557
ERRMSG  006740          2296*   2314    2317#
ERRPC   003322          1559    1570#
ERRVEC= 000004           817#   1746    1747*   1749*   1752*
ERTABO  007112          2311    2351#
EXIT  = 000205           844#
EXITER  007046          2337    2342#
FLAG    032006          6189#   6208
FLOAT   003156          1533#   1539
FLTDAT  032016          5626    5636    5640    5644    5651    5691    6193#
FY      003202          1541#   1545    1550
GETQI   031356          4424    4428    4501    4505    4578    4582    4655    4659    4780    4784    6039#
GETQO   031344          4395    4399    4472    4476    4549    4553    4626    4630    4712    4716    6029#
GETSI   030226          3536    3540    3589    3593    3642    3646    3695    3699    3756    3760    4855    4859    4876
                        4880    4892    4901    5024    5028    5045    5049    5075    5079    5096    5100    5112    5121
                        5274    5278    5295    5299    5315    5319    5344    5348    5365    5369    5381    5390    5783#
                        6167
GNS   = ****** U      2250    2253    2254    2255    2256    2257    2258    2259    2260    2261    2262    2263    2264
                        2265    2266    2267
HALTS   006770          2281    2328#
HILIM   006052          2095*   2103    2119#
HT    = 000011           727#   1831    1872
INCHAR  011546          2510    2538#
```

```
INIFLG  001506          1044#  1462   1492   1499*
INLP1   005766          2100#  2109
INPUT = 104415          2264#  2608   2659   2671   2679   2761   2769
INRDY   031066          4127   4173   4212   4220   4228   4936   4949   4954   5134   5148   5153   5177   5191
                        5196   5403   5417   5422   5443   5457   5471   5476   5534   5544   5552   5652   5668
                        5673   5739   5754   5759   5948#
INTTY   013664          2689   2710   2726   2741   2918#
IOTVEC= 000020           822#
KMACTV  001470          1033#  1476   1601*  1602   2559   2573   2654*  2839*  2845*  2846*  2850   2875   2941*
                        2942
KMCM    011176          1567   2467#
KMCR00  002100          1228#
KMCR01  002110          1233#
KMCR02  002120          1238#
KMCR03  002130          1243#
KMCR04  002140          1248#
KMCR05  002150          1253#
KMCR06  002160          1258#
KMCR07  002170          1263#
KMCR10  002200          1268#
KMCR11  002210          1273#
KMCR12  002220          1278#
KMCR13  002230          1283#
KMCR14  002240          1288#
KMCR15  002250          1293#
KMCR16  002260          1298#
KMCR17  002270          1303#
KMCSR   002066          1211#  1527*  1542   1548*  1577   1707   1774   2389   2443   2577*  2586   2634   2991*
KMCSRH  002070          1212#  2424*  2425*  2429*  2435*  2436*  2442*  2444*  2586*  2587*  2588
KMCTL   002072          1213#  2588*  2589*  2590
KMNUM   001472          1034#  1430   1684   2652*  2666*  2831*  2832   2840   2842
KMPO4   002074          1214#  2413*  2419   2456   2461   2590*  2591*  2592   5789   5802   5844   5960   6035*
                        6045*  6046*
KMPO6   002076          1215#  2430*  2592*  2593*
KMRLVL  002060          1208#  1677   1678*  2595*  2596*  2597
KMRVEC  002056          1207#  1677*  1710   2578*  2579*  2595
KMS100  002102          1229#
KMS101  002112          1234#
KMS102  002122          1239#
KMS103  002132          1244#
KMS104  002142          1249#
KMS105  002152          1254#
KMS106  002162          1259#
KMS107  002172          1264#
KMS110  002202          1269#
KMS111  002212          1274#
KMS112  002222          1279#
KMS113  002232          1284#
KMS114  002242          1289#
KMS115  002252          1294#
KMS116  002262          1299#
KMS117  002272          1304#
KMS200  002104          1230#
KMS201  002114          1235#
KMS202  002124          1240#
KMS203  002134          1245#
```

```
KMS204  002144            1250#
KMS205  002154            1255#
KMS206  002164            1260#
KMS207  002174            1265#
KMS210  002204            1270#
KMS211  002214            1275#
KMS212  002224            1280#
KMS213  002234            1285#
KMS214  002244            1290#
KMS215  002254            1295#
KMS216  002264            1300#
KMS217  002274            1305#
KMS300  002106            1231#
KMS301  002116            1236#
KMS302  002126            1241#
KMS303  002136            1246#
KMS304  002146            1251#
KMS305  002156            1256#
KMS306  002166            1261#
KMS307  002176            1266#
KMS310  002206            1271#
KMS311  002216            1276#
KMS312  002226            1281#
KMS313  002236            1286#
KMS314  002246            1291#
KMS315  002256            1296#
KMS316  002266            1301#
KMS317  002276            1306#
KMTLVL  002064            1210#   1679    1680*   2599*   2600*
KMTVEC  002062            1209#   1679*   2597*   2598*   2599
KM.END  002300            1308#   2650    2946
KM.MAP  002100            1039    1227#   1434    1501    1511    2569    2571    2648    2653    2867    2944    2948
LF    = 000012             728#   1866    1872
LINE    010721            2467#   2762
LOBITS  006056            2097*   2121#
LOCK    001444            1020#   1773*   1785    1787    2128*   2305    3097*   3113*   3140*   3156*   3183*   3206*   3242*
                          3262*   4376*   4408*   4453*   4485*   4530*   4562*   4607*   4639*
LOKFLG  001510            1046#
LOLIM   006050            2094*   2105    2118#
LRC8  = 000200            5996#
LUTYPE= ****** U           686    5968
MASKX   001454            1027#
MASTEK  010016            2307    2467#
MCSRX   007746            1666    2467#
MDATA   011276            2189    2199    2484#
MEMLIM  001466            1032#   1625*
MEPASS  007620            1665    2467#
MERRPC  010073            2310    2467#
MERRX   007773            1672    2467#
MERR2   007646            2467#   2852
MERR3   007673            1598    2467#
MESDAT  032012            4334    4827    4833    4926    4931    4992    4998    5002    5058    5133    5176    5241    5247
                          5252    5327    5402    5456    5514    5519    5524    5585    5722    5732    5738    6191#
MFSLD   031530            4333    4832    4930    4997    5001    5246    5251    5518    5523    5584    5635    5639    5643
                          5731    6097#
MILK    001504            1040#   1435*   1674    2567*   2572*   2576
```

```
MLOCK   007717          1639    2467#
MNEW    010020          1593    2467#
MOD     010462          2467#   2709
MPASSX  007762          1670    2467#
MP AIL  007562          2385    2402    2467#
MR      007643          1646    2467#   2624
MRECET= 004000           844#
MSTCLR= 104410          2259#   2391    3042    3068    3099    3142    3185    3244    3296    3320    3344    3380    3414
                        3459    3518    3571    3624    3677    3731    3791    3821    3851    3881    3912    3962    4001
                        4040    4079    4118    4161    4207    4253    4320    4378    4455    4532    4609    4684    4752
                        4822    4924    4987    5236    5512    5576    5617    5713
MTITLE  001000           890#   1466
MTSTN   010004          2308    2467#   2609
MVECX   007754          1658    2467#
MV35    010574          2467#   2740
NEXT    001442          1019#   2127    2347    2989*   3015*   3040*   3066*   3096*   3139*   3182*   3241*   3294*   3318*
                        3342*   3378*   3412*   3457*   3516*   3569*   3622*   3675*   3729*   3789*   3819*   3849*   3879*
                        3910*   3960*   3999*   4038*   4077*   4116*   4159*   4205*   4251*   4318*   4375*   4452*   4529*
                        4606*   4682*   4750*   4820*   4922*   4985*   5234*   5510*   5574*   5615*   5711*
NITCH   030256          5789*   5790*   5791*   5792*   5794#
NOACT   011057          1478    2467#   2561
NODEV   003240          1529    1551#
NUM     010324          2467#   2660
OCOR    030260          3421    3466    3529    3582    3635    3688    3749    4703    4771    4836    4934    5005    5255
                        5521    5526    5587    5647    5735    5797#   5803    5833    5875    5891    5932    6025    6111
OK      003220          1543    1546#   1569
ONE     001464          1031#   6208
OUTRDY  030412          3520    3525    3573    3578    3626    3631    3679    3684    3736    3740    3745    3768    4831
                        4929    4996    5245    5517    5583    5817    5826    5837#   5862    5871    5884    5888    5908
                        5917    6012    6021    6058    6074    6088    6105
PACT00  002302          1314#
PACT01  002306          1317#
PACT02  002312          1320#
PACT03  002316          1323#
PACT04  002322          1326#
PACT05  002326          1329#
PACT06  002332          1332#
PACT07  002336          1335#
PACT10  002342          1338#
PACT11  002346          1341#
PACT12  002352          1344#
PACT13  002356          1347#
PACT14  002362          1350#
PACT15  002366          1353#
PACT16  002372          1356#
PACT17  002376          1359#
PARBIT= 040000           844#
PERFOR= 004537           844#
PFTAB   007324          2386    2408#
PIRQ    = 177772         734#
PIRQVE= 000240           828#
POPR0   = 012600         839#   2341
POP1SP= 005726           837#
POP2SP= 022626           841#
PRIO    010423          2467#   2688
PRIRTY  014136          2934*   2940*   2953    2974#
```

```
PR0    = 000000            751#   2910    2911
PR1    = 000040            752#
PR2    = 000100            753#
PR3    = 000140            754#
PR4    = 000200            755#   2912
PR5    = 000240            756#   2913
PR6    = 000300            757#   2914
PR7    = 000340            758#    863     865     867     869    2915
PS     = 177776            731#    732    1427*   1636*   2879*  2889*
PSW    = 177776            732#
PUSHR0= 010046             838#   2338
PUSH1S= 005746             836#
PUSH2S= 024646             840#
PWRVEC= 000024             823#   2364*   2365*   2374*   2380*  2399*  2400*
QV.FLG  001511            1047#   1433*   1683*
RDCHR  = 104402            1980   2253#
RDLIN  = 104403            2053   2254#
RDOCT  = 104404            2102   2255#
RESREG  006766             2324   2327#
RESVEC= 000010              818#
RES05  = 104407            2258#  2327
ROMCLK= 104412             2261#  2414    2417    2454    2459    2993   3018   3044   3070   3102   3104   3115   3117
                           3145   3147    3158    3160    3191    3193   3212   3214   3249   3251   3267   3269   3297
                           3321   3347    3356    3383    3385    3389   3417   3419   3424   3434   3462   3464   3469
                           3473   3483    3493    3522    3527    3548   3575   3580   3601   3628   3633   3654   368*
                           3686   3707    3738    3742    3747    3770   3797   3827   3857   3887   3919   3929   3931
                           3969   3978    4008    4017    4047    4056   4086   4095   4128   4168   4174   4213   4221
                           4229   4260    4263    4283    4286    4327   4331   4339   4693   4697   4701   4731   4761
                           4765   4769    4799    4937    4950    4955   4964   5135   5149   5154   5163   5178   5192
                           5197   5206    5404    5418    5423    5432   5444   5458   5472   5477   5486   5528   5535
                           5545   5553    5580    5589    5653    5669   5674   5683   5740   5755   5760   5769   5787
                           5800   5815    5819    5822    5828    5831   5842   5860   5864   5867   5873   5886   5889
                           5906   5910    5913    5919    5939    5941   5958   6010   6014   6017   6023   6033   6043
                           6056   6060    6063    6076    6079    6090   6092   6107   6121   6123
RUN       001500           1037#  1436*   2565*   2566*   2573
SAVACT    001474           1035#  1596    2850*   2942*
SAVNUM    001476           1036#  1430*   1681*   1684*   2843*  2936*
SAVPC     001460           1029#  1557*   1572    2134*   2353
SAVSP     001456           1028#
SAV05  = 104406            2257#  2286
SCHAR     031062           4119*  4162*   5900    5918    5923   5927*  5928   5934*  5944#
SCOP1  = 104405            2256#  3112    3125    3155    3168   3202   3223   3258   3276   4407   4436   4484   4513
                           4561   4590    4638    4667
SILOLD    030622           4124   4140    4170    4186    5895#
SIMBCC    031122           4390   4419    4467    4496    4544   4573   4621   4650   4707   4775   4847   5016   5067
                           5266   5336    5628    5724    5968#
SOFTSW    011600           2508   2547#
SOM       031454           5250   6070#
SPACNT= 006411             2169*  2193    2196*   2210#
STACK  = 001200             722#  1428    1615    2348
STAT      001450           1025#
STAT1     002050           1200#  2580*   3075    4254    4256   4268   4291   4321   4323   4350   5618   5714
STAT2     002052           1201#  2581*   3300    3324
STAT3     002054           1202#  2582*   4272    4294    4345
STFFCK    031672           6150#
STFFCL    031612           5924   6128#
```

```
STKLMT= 177774           733#
STRTSW  001446          1024#  1468*  1471*  1472   1474   1488*  1494   1496   1591   1637   1644   2602   2625*
                        2655   2863
STUFDT  032036          6199#
STUFLG  031064          4120*  4163*  5921   5935*  5945#
SV05    006100          2138#
SWFLG   011544          1431*  2503*  2530*  2536#
SWR     001240           920#  1452*  1454   1458*  1468   1596   1601   1741   1759   1783   2275   2280   2336
                        2343   2345   2372   2392   2432   2492   2529*
SWREG   000176           883#  1447*  1458   2492   2549
SW0   = 000001           786#
SW00  = 000001           776#   786   1472   1488   2655   2863
SW01  = 000002           775#   785   1644   2602   2625
SW02  = 000004           774#   784
SW03  = 000010           773#   783   1591
SW04  = 000020           772#   782
SW05  = 000040           771#   781
SW06  = 000100           770#   780   2432
SW07  = 000200           769#   779
SW08  = 000400           768#   778   2343
SW09  = 001000           767#   777   1783
SW1   = 000002           785#
SW10  = 002000           766#  2345
SW11  = 004000           765#
SW12  = 010000           764#  2275
SW13  = 020000           763#  2280
SW14  = 040000           762#
SW15  = 100000           761#
SW2   = 000004           784#
SW3   = 000010           783#
SW4   = 000020           782#
SW5   = 000040           781#
SW6   = 000100           780#
SW7   = 000200           779#
SW8   = 000400           778#
SW9   = 001000           777#
SYNC    030276          3794   3824   3854   3884   5807#
SYNLD   031374          4691   4759   4830   4928   4995   5244   5516   5582   5621   5622   5717   5718   6050#
TBITVE= 000014           819#
TEMP    011234          2176   2440*  2445*  2451*  2463*  2482#  3345*  3351*  3354*  3360*
TIMER = 104414          2263#  3387   3918   3968   4007   4046   4085   4262   4285   4329
TKVEC = 000060           826#
TLAST = 027706          2628   5778#
TPVEC = 000064           827#
TRAPVE= 000034           825#
TRTVEC= 000014           820#
TST1    014140          1735   2615   2633   2987#
TST10   015136          3182   3239#
TST11   015312          3241   3292#
TST12   015354          3294   3316#
TST13   015416          3318   3340#
TST14   015516          3342   3376#
TST15   015616          3378   3410#
TST16   015754          3412   3455#
TST17   016152          3457   3514#
TST2    014214          2989   3013#
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TST20   016334          3516    3567#
TST21   016516          3569    3620#
TST22   016700          3622    3673#
TST23   017062          3675    3727#
TST24   017270          3729    3787#
TST25   017356          3789    3817#
TST26   017446          3819    3847#
TST27   017534          3849    3877#
TST3    014262          3015    3038#
TST30   017624          3879    3908#
TST31   017776          3910    3958#
TST32   020112          3960    3997#
TST33   020230          3999    4036#
TST34   020346          4038    4075#
TST35   020464          4077    4114#
TST36   020614          4116    4157#
TST37   020754          4159    4203#
TST4    014334          3040    3064#
TST40   021114          4205    4249#
TST41   021342          4251    4316#
TST42   021536          4318    4373#
TST43   022052          4375    4450#
TST44   022366          4452    4527#
TST45   022702          4529    4604#
TST46   023216          4606    4680#
TST47   023454          4682    4748#
TST5    014426          3066    3094#
TST50   023712          4750    4818#
TST51   024244          4820    4920#
TST52   024446          4922    4983#
TST53   025546          4985    5232#
TST54   026746          5234    5508#
TST55   027200          5510    5572#
TST56   027316          5574    5613#
TST57   027706          5615    5709#   5778
TST6    014566          3096    3137#
TST60 = ****** U        5711
TST7    014726          3139    3180#
TTST    004146          1640*   1642*   1737#
TWOSYN= 010000           844#
TYPDAT  006754          2302    2320    2323#
TYPE  = 104401          1466    1478    1500    1555    1560    1566    1593    1598    1639    1646    1665    1666    1668
                        1670    1672    1836    1987    1993    1998    2002    2007    2008    2010    2013    2017    2082
                        2084    2100    2107    2108    2159    2199    2250#   2303    2304    2307    2308    2310    2312
                        2316    2321    2385    2401    2506    2509    2561    2607    2624    2630    2667    2687    2701
                        2708    2717    2724    2731    2739    2751    2852
TYPMSG  006654          2300    2303#
VEC     010402          2467#   2680
VECMAP  013400          2851    2863#
VECTR   014132          2933*   2939*   2958    2964*   2972#
WHAT    005770          2093*   2101#
WHERE   006054          2096*   2110    2120#
WHICH   013372          2669    2859#
WRDCNT  006406          2167*   2200*   2208#
WRKO.F  006742          2315    2318#
XBX     006542          2276    2278    2280#
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XCSR    004104            1667    1705#
XERR    004126            1673    1714#
XHEAD   010100            1500    2467#
XPASS   004120            1671    1711#
XPOLY   031226            4382-   4411*   4459*   4488*   4536*   4565*   4613*   4642*   4690*   4758*   4845*   5014*   5065*
                          5264*   5334*   5623*   5719*   5984    5986    5994#
XSTATG  011206            1509    2467#
XTSTN   007120            2309    2354#
XVEC    004112            1669    1708#
ZERO    001462            1030#   6208
$APTHD  002034            1182    1188#
$ASTAT= ****** U          1906    1921
$ATYC   004722            1877    1879#
$ATY1   004676            1875#
$ATY3   004704            1821    1876#
$ATY4   004714            1878#   2331
$AUTOB  001234             917#
$BASE   001372             992#   2938
$BDADR  001222             912#
$BDDAT  001226             914#
$CDW1   001376             994#   2935
$CDW2   001400             995#
$CHARC  004672            1838*   1848*   1855    1864*   1869#
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$CMTAG  001200             900#
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$CM2  = 000014             932#    933#    934#    935#    936#    937#    938#
$CM3  = 000006             930#    932
$CM4  = 000005             938#    939#    940#    941#    942#    943#
$CNTLG  005534            2028#
$CNTLU  005527            2002    2027#
$COD  = ****** U           686
$CPUOP  001344             966#
$CRAP = 177777               1#   2976#   2979    2982#   3002#   3005    3008#   3027#   3030    3033#   3053#   3056    3059#
                          3083#   3086    3089#   3126#   3129    3132#   3169#   3172    3175#   3228#   3231    3234#   3281#
                          3284    3287#   3305#   3308    3311#   3329#   3332    3335#   3364#   3367    3371#   3398#   3401
                          3405#   3443#   3446    3450#   3501#   3504    3509#   3554#   3557    3562#   3607#   3610    3615#
                          3660#   3663    3668#   3713#   3716    3722#   3776#   3779    3782#   3806#   3809    3812#   3836#
                          3839    3842#   3866#   3869    3872#   3896#   3899    3903#   3947#   3950    3953#   3986#   3989
                          3992#   4025#   4028    4031#   4064#   4067    4070#   4103#   4106    4109#   4144#   4147    4152#
                          4190#   4193    4198#   4237#   4240    4244#   4305#   4308    4311#   4361#   4364    4368#   4438#
                          4441    4445#   4515#   4518    4522#   4592#   4595    4599#   4669#   4672    4675#   4737#   4740
                          4743#   4805#   4808    4813#   4908#   4911    4915#   4967#   4970    4978#   5215#   5218    5227#
                          5495#   5498    5503#   5561#   5564    5567#   5598#   5601    5608#   5695#   5698    5704#
$CRLF   001313             945#   1837    1872    2007    2027    2087    2108    2159    2303    2304    2312    2607    2667
$DDW0   001402             996#   2943
$DDW1   001404             997#
$DDW10  001426            1006#
$DDW11  001430            1007#
$DDW12  001432            1008#
$DDW13  001434            1009#
$DDW14  001436            1010#
$DDW15  001440            1011#
$DDW2   001406             998#
$DDW3   001410             999#
$DDW4   001412            1000#
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$DDW5   001414            1001#
$DDW6   001416            1002#
$DDW7   001420            1003#
$DDW8   001422            1004#
$DDW9   001424            1005#
$DEVCT  001326             957#
$DEVM   001374             993#  2941
$DOAGN  004100            1682   1691   1696   1702#
$ENDAD  004070             876   1464   1698#  2334
$ENDCT  004054            1693#
$ENV    001336             962#  1445   1481   1483   1816   1884   1908   2328   2494
$ENVM   001337             963#  1486   1818   1823   1886
$EOP    003662            1661#  5711
$EOPCT  004046            1690#  1694
$ERFLG  001203             903#  1432*  1664*  1726   1755   1757*  1778   2285*  2299   2313*  2387*
$ERMAX  001215             909#  1778
$ERROR  006512             866   2274#
$ERRPC  001216             910#  1441*  1685*  1734*  2282   2284*  2388*
$ERRTB  001512            1064#  2295
$ERTTL  001212             907#  1676   1716   2342*  2584*
$ETABL  001336             961#
$ETEND  001442            1014#  1194
$FATAL  001320             954#  1912*
$FFLG   005142            1875*  1878*  1906   1915*  1923#
$FILLC  001256             928#  1841   1872
$FILLS  001255             927#  1872
$GDADR  001220             911#
$GDDAT  001224             913#
$GET42  004060            1695#
$GTSWR= ****** U          2252
$HD   = 000000             696
$HIBTS  002034            1189#
$HIOCT  005722            2075*  2086#
$ICNT   001204             904#  1763*  1764   1766*  1777
$ILLUP  007316            2364   2380   2404#
$INPUT  005724            2091#  2264
$INTAG  001235             918#
$ITEMB  001214             908#  2290*  2330
$LF     001314             946#  1872   2017   2027   2087
$LFLG   005141            1916*  1922#
$LPADR  001206             905#  1443*  1643*  1647   1770*  1772   1777   2347*  2349   2623*  2633*  2635
$LPERR  001210             906#
$MADR1  001350             979#
$MADR2  001354             983#
$MADR3  001360             986#
$MADR4  001364             989#
$MAIL   001316             952#  1190   1194   1769   1816
$MAMS1  001346             973#  2937
$MAMS2  001352             981#
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$MAMS4  001362             987#
$MBADR  002036            1190#
$MFLG   005140            1876*  1882   1917*  1921#
$MNEW   005552            2031#  2509
$MSGAD  001332             959#  1892*  1895
$MSGLG  001334             960#  1897*
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$MSWR   005541  2029#  2506
$MTYP1  001347   974#
$MTYP2  001353   982#
$MTYP3  001357   985#
$MTYP4  001363   988#
$MXCNT  004362  1767  1777#
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                3043#  3053  3059  3061  3068  3069#  3083  3089  3091  3099  3100#  3126  3132
                3134  3142  3143#  3169  3175  3177  3185  3186#  3228  3234  3236  3244  3245#
                3281  3287  3289  3296  3297#  3305  3311  3313  3320  3321#  3329  3335  3337
                3344  3345#  3364  3371  3373  3380  3381#  3398  3405  3407  3414  3415#  3443
                3450  3452  3459  3460#  3501  3509  3511  3518  3519#  3554  3562  3564  3571
                3572#  3607  3615  3617  3624  3625#  3660  3668  3670  3677  3678#  3713  3722
                3724  3731  3732#  3776  3782  3784  3791  3792#  3806  3812  3814  3821  3822#
                3836  3842  3844  3851  3852#  3866  3872  3874  3881  3882#  3896  3903  3905
                3912  3913#  3947  3953  3955  3962  3963#  3986  3992  3994  4001  4002#  4025
                4031  4033  4040  4041#  4064  4070  4072  4079  4080#  4103  4109  4111  4118
                4119#  4144  4152  4154  4161  4162#  4190  4198  4200  4207  4208#  4237  4244
                4246  4253  4254#  4305  4311  4313  4320  4321#  4361  4368  4370  4378  4379#
                4438  4445  4447  4455  4456#  4515  4522  4524  4532  4533#  4592  4599  4601
                4609  4610#  4669  4675  4677  4684  4685#  4737  4743  4745  4752  4753#  4805
                4813  4815  4822  4823#  4908  4915  4917  4924  4925#  4967  4978  4980  4987
                4988#  5215  5227  5229  5236  5237#  5495  5503  5505  5512  5513#  5561  5567
                5569  5576  5577#  5598  5608  5610  5617  5618#  5695  5704  5706  5713  5714#
                5778#
$NULL   001254   926#  1843  1872
$NWTST= 000000  2986#  3012#  3037#  3063#  3093#  3136#  3179#  3238#  3291#  3315#  3339#  3375#  3409#
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                4035#  4074#  4113#  4156#  4202#  4248#  4315#  4372#  4449#  4526#  4603#  4679#  4747#
                4817#  4919#  4982#  5231#  5507#  5571#  5612#  5708#
$OVER   004334  1739  1742  1753  1765  1771#
$PASS   001324   956#  1663*  1675  1687*  1688*  1705  1713  1761  1778  2583*
$PASTM  002042  1192#
$PWRDN  007126   864  1429  2364#  2399
$PWRMG  007312  2402#
$PWRUP  007200  2374  2380#
$QUES   001312   944#  1872  2010  2027  2084  2087  2107  2630  2702  2718  2732  2752
$RDCHR  005144  1947#  2253
$RDDEC= ****** U  2256
$RDLIN  005264  1975#  2254
$RDOCT  005564  2048#  2255
$RDSZ = 000007  1968#
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$REG4   001272   936#  2139*  2152  6208
$REG5   001274   937#  2138*  2153  6208
$RTNAD  004102  1704#
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$S    = 000061     1#  2989  2991#  3015  3017#  3040  3043#  3066  3069#  3096  3100#  3139  3143#
                3182  3186#  3241  3245#  3294  3297#  3318  3321#  3342  3345#  3378  3381#  3412
                3415#  3457  3460#  3516  3519#  3569  3572#  3622  3625#  3675  3678#  3729  3732#
                3789  3792#  3819  3822#  3849  3852#  3879  3882#  3910  3913#  3960  3963#  3999
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                    4002#  4038   4041#  4077   4080#  4116   4119#  4159   4162#  4205   4208#  4251   4254#
                    4318   4321#  4375   4379#  4452   4456#  4529   4533#  4606   4610#  4682   4685#  4750
                    4753#  4820   4823#  4922   4925#  4985   4988#  5234   5237#  5510   5513#  5574   5577#
                    5615   5618#  5711   5714#
$SAVRE= ****** U    2256
$SAVR6  007322      2373*  2381   2382*  2383*  2406#
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$SVPC = 000040       874#   879
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                    1741   1753   1755   1756   1757   1758   1759   1771   1777   2403   2988   3014   3039
                    3065   3095   3138   3181   3240   3293   3317   3341   3377   3411   3456   3515   3568
                    3621   3674   3728   3788   3818   3848   3878   3909   3959   3998   4037   4076   4115
                    4158   4204   4250   4317   4374   4451   4528   4605   4681   4749   4819   4921   4984
                    5233   5509   5573   5614   5710
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$SWRMK= 000000      1730
$TESTN  001322       955#  1769*
$TIMES  001310       943#  1686*  1758*  1764   1767*  1777
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$TKS    001244       922#  1738   1934   1949   1955   2538   2918   6182
$TMP0   001276       938#  1502*  2469   2875*  2876*  5812*  5824*  5858*  5869*  5904*  5915*  5956*  5962*
                    5974*  5988*  6008*  6019*  6054*  6065*  6104*  6109*
$TMP1   001300       939#  1503*  2471   5165*  5166*  5167   5208*  5209*  5210   5434*  5435*  5436   5488*
                    5489*  5490   5685*  5686*  5687   5771*  5772*  5773   5856*  5872   5882*  5885   5899*
                    5903*  5930*  5937*  5975*  5980*  6006*  6022
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                    5491   5671*  5672*  5687*  5688   5757*  5758*  5773*  5774   6134*  6144*  6157*  6170*
                    6208
$TMP3   001304       941#  1506*  2475   2675   2678   2683   2686   2765   2768   2773   2776
$TMP4   001306       942#  1507*  2477   2658*  2670*  2861   5840*  5846*
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                    3138#  3179   3181#  3238   3240#  3291   3293#  3315   3317#  3339   3341#  3375   3377#
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                    3996   3998#  4035   4037#  4074   4076#  4113   4115#  4156   4158#  4202   4204#  4248
                    4250#  4315   4317#  4372   4374#  4449   4451#  4526   4528#  4603   4605#  4679   4681#
                    4747   4749#  4817   4819#  4919   4921#  4982   4984#  5231   5233#  5507   5509#  5571
                    5573#  5612   5614#  5708   5710#
$TPB    001252       925#  1861*  1872   2279*  2543*  2923*
$TPFLG  001257       929#  1810   1872
$TPS    001250       924#  1859   1872   2277   2541   2921
$TRAP   006414       868   2227#
$TRAP2  006436      2238#  2249
$TRP  = 000021      2242#  2251#  2253   2254#  2255#  2256#  2257#  2258#  2259#  2260#  2261#  2262#  2263#
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$TRPAD  006450      2232   2249#
$TSTM   002040      1191#
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                    3515*  3568*  3621*  3674*  3728*  3788*  3818*  3848*  3878*  3909*  3959*  3998*  4037*
                    4076*  4115*  4158*  4204*  4250*  4317*  4374*  4451*  4528*  4605*  4681*  4749*  4819*
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$TTYIN  005520      1977   1978   1990   2008   2022   2026#
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$TYPDS=  ******  U          2251
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$TYPEX   004674             1865    1867    1870#
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$UNIT    001330              958#
$UNITM   002044             1193#
$USWR    001342              965#
$VECT1   001366              990#   2939    2940
$VECT2   001370              991#
$XTSTR   004174             1736    1744#
$Y     = 000000                1#   1195#
$$GET4=  000000             1697#
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.      = 033730              856#    858     861#    874     875#    877#    879#    881#    885#    889#    899#    947    1033#
                            1034#   1035#   1036#   1045#   1172#   1178    1179#   1181#   1183#   1226#   1228#   1229#  1230#
                            1231#   1233#   1234#   1235#   1236#   1238#   1239#   1240#   1241#   1243#   1244#   1245#  1246#
                            1248#   1249#   1250#   1251#   1253#   1254#   1255#   1256#   1258#   1259#   1260#   1261#  1263#
                            1264#   1265#   1266#   1268#   1269#   1270#   1271#   1273#   1274#   1275#   1276#   1278#  1279#
                            1280#   1281#   1283#   1284#   1285#   1286#   1288#   1289#   1290#   1291#   1293#   1294#  1295#
                            1296#   1298#   1299#   1300#   1301#   1303#   1304#   1305#   1306#   1470    1480    1587#  1600
                            1705    1777    1778    1872    1924#   1934    2026#   2027    2033#   2087    2376    2405   2448#
                            2483#   2485#   2539    2542    2563    2656    2697    2805    2809    2855    2886    2919   2922
                            3076    4255    4269    4292    4322    4351    4902    5122    5391    6208#
.ADVAN   006060             2127#   2267
.BEGIN   003464             1615#
.CNVRT   006170             2160#   2266
.CONVR   006164             2159#   2265
.DATAC   007446             2262    2439#
.DELAY   007332             2260    2412#
.MSTCL   007362             2259    2423#
.RESO5   006132             2148#   2258
.ROMCL   007400             2261    2428#
.SAVO5   006072             2134#   2257
.SCOP1   004364             1782#   2256
.START   002402              886    1427#   1443    2526
.TIMER   007512             2263    2450#
.$ASTA=  ******  U          1876    1879
.$X    = 002034             1178#   1183
```

```
COMMEN   829#
ENDCOM   829#
ERROR    723#  3000  3025  3051  3081  3111  3124  3154  3167  3201  3222  3257  3275  3303  3327
        3353  3362  3396  3431  3441  3480  3490  3499  3538  3542  3552  3591  3595  3605  3644
        3648  3658  3697  3701  3711  3758  3762  3804  3834  3864  3894  3926  3938  3945  3976
        3984  4015  4023  4054  4062  4093  4101  4134  4180  4219  4227  4235  4281  4303  4357
        4397  4401  4426  4430  4474  4478  4503  4507  4551  4555  4580  4584  4628  4632  4657
        4661  4714  4718  4782  4786  4857  4861  4878  4882  4894  4903  4943  4962  5026  5030
        5047  5051  5077  5081  5098  5102  5114  5123  5141  5161  5170  5184  5204  5213  5276
        5280  5297  5301  5317  5321  5346  5350  5367  5371  5383  5392  5410  5430  5439  5450
        5464  5484  5493  5532  5541  5551  5559  5596  5659  5681  5690  5746  5767  5776  5848
        5964  6169
ESCAPE   829#
GETPRI   829#
GETSWR   829#
HLT      842#
KMEND      1#  1648
KMFRNT     1#   686
MULT     829#
NEWTST   829#  2986  3012  3037  3063  3093  3136  3179  3238  3291  3315  3339  3375  3409  3454
        3513  3566  3619  3672  3726  3786  3816  3846  3876  3907  3957  3996  4035  4074  4113
        4156  4202  4248  4315  4372  4449  4526  4603  4679  4747  4817  4919  4982  5231  5507
        5571  5612  5708
POP      829#  1918  1919  2076  2392  2393  2966
PUSH     829#  1879  1881  1902  2050  2366  2372  2929
REPORT     1#   829#
SCOPE    724#  2987  3013  3038  3064  3094  3137  3180  3239  3292  3316  3340  3376  3410  3455
        3514  3567  3620  3673  3727  3787  3817  3847  3877  3908  3958  3997  4036  4075  4114
        4157  4203  4249  4316  4373  4450  4527  4604  4680  4748  4818  4920  4983  5232  5508
        5572  5613  5709
SETPRI   829#
SETTRA  2242#  2253  2254  2255  2256  2257  2258  2259  2260  2261  2262  2263  2264  2265  2266
        2267
SETUP    829#
SKIP     829#
SLASH    829#
SPACE    829#
STARS    829#   872   895   947   950  1175  1177  1184  1656  1723  1795  1874  1933  1939  1968
        2036  2221  2362  2378  2986  3012  3037  3063  3093  3136  3179  3238  3291  3315  3339
        3375  3409  3454  3513  3566  3619  3672  3726  3786  3816  3846  3876  3907  3957  3996
        4035  4074  4113  4156  4202  4248  4315  4372  4449  4526  4603  4679  4747  4817  4919
        4982  5231  5507  5571  5612  5708
SWRSU    829#
TRMTRP  2242#
TYPBIN   829#
TYPDEC   829#
TYPNAM   829#
TYPNUM   829#
TYPOCS   829#
TYPOCT   829#
TYPTXT   829#
$ABORT   686#
$AUTO      1#  1512
$BCC     686#  4361  4438  4515  4592
$BINCR   686#  4669  4737
$BINWI   686#  3713
```

```
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$CDATA    686#    5598    5695
$CLOCK    686#    3329
$COMP       1#     686#   3921    3933    3940    3971    3980    4010    4019    4049    4058    4088    4097    4215    4223
          4231    4957    5156    5199    5425    5479    5676    5762
$CRC      686#    4380    4409    4457    4486    4534    4563    4611    4640
$CRCSH    686#    4685    4753
$CYCLE      1#    2550
$EMPTY    686#    5495
$EOP        1#    1648
$ERTBL      1#    1066
$FINI       1#    5778
$FLAG     686#
$FLOAT    686#    3187    3207    3246    3263
$GETPA      1#
$HALF     686#    5561
$HEADE      1#     696
$INACT    686#    3776    3806    3836    3866
$INIT     686#
$LINE1    686#    3169    3228
$LU1      686#    2976    3002    3027    3053
$LU12     686#    3083
$LU17     686#    3126
$MARHI      1#
$MARK     686#    4190
$MATCH    686#    4946    5144    5187    5413    5467    5664    5750
$MOCK       1#
$MODEM    686#    4237
$MSG        1#    2467
$MULT     686#
$PASEN      1#    1662
$PATTE    686#    4103    4144
$PFAIL      1#    2357
$QQQI     686#    6029    6039
$QUEST      1#    2659    2671    2679    2761    2769
$RAMCL      1#    2411
$RCLK       1#    2414    2417    2454    2459    2993    3018    3044    3070    3102    3104    3115    3117    3145    3147
          3158    3160    3191    3193    3212    3214    3249    3251    3267    3269    3297    3321    3347    3356    3383
          3385    3389    3417    3419    3424    3434    3462    3464    3469    3473    3483    3493    3522    3527    3548
          3575    3580    3601    3628    3633    3654    3681    3686    3707    3738    3742    3747    3770    3797    3827
          3857    3887    3919    3929    3931    3969    3978    4008    4017    4047    4056    4086    4095    4128    4168
          4174    4213    4221    4229    4260    4263    4283    4286    4327    4331    4338    4693    4697    4701    4731
          4761    4765    4769    4799    4937    4950    4955    4964    5135    5149    5154    5163    5178    5192    5197
          5206    5404    5418    5423    5432    5444    5458    5472    5477    5486    5528    5535    5545    5553    5580
          5589    5653    5669    5674    5683    5740    5755    5760    5769    5787    5800    5815    5819    5822    5828
          5831    5842    5860    5864    5867    5873    5886    5889    5906    5910    5913    5919    5939    5941    5958
          6010    6014    6017    6023    6033    6043    6056    6060    6063    6076    6079    6090    6092    6107    6121
          6123
$RCRC     686#    4908
$REC      686#    3896    3947    3986    4025    4064
$ROVAR      1#    1016
$SCADD      1#    1734
$SCAD1      1#    1773
$SIMBC      1#    5968
$SINAC    686#
$SOFTC      1#    2487
```

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$STUFF    686#
$SWPAC    686#   3281   3305
$TCHAR    686#   4826   4925   4991   5240
$TCRC     686#   4805   4967   5215
$TRANW    686#   4845   5014   5065   5264   5334
$TRAN1    686#   3364   3398   3443
$TSTN       1#   2984   3010   3035   3061   3091   3134   3177   3236   3289   3313   3337   3373   3407   3452
            3511   3564   3617   3670   3724   3784   3814   3844   3874   3905   3955   3994   4033   4072   4111
            4154   4200   4246   4313   4370   4447   4524   4601   4677   4745   4815   4917   4980   5229   5505
            5569   5610   5706
$UPADD      1#   2385
$VARIA      1#    888
$WINDO    686#   3501   3554   3607   3660
$XZ         1#   2976   2982   3002   3008   3027   3033   3053   3059   3083   3089   3126   3132   3169   3175
            3228   3234   3281   3287   3305   3311   3329   3335   3364   3371   3398   3405   3443   3450   3501
            3509   3554   3562   3607   3615   3660   3668   3713   3722   3776   3782   3806   3812   3836   3842
            3866   3872   3896   3903   3947   3953   3986   3992   4025   4031   4064   4070   4103   4109   4144
            4152   4190   4198   4237   4244   4305   4311   4361   4368   4438   4445   4515   4522   4592   4599
            4669   4675   4737   4743   4805   4813   4908   4915   4967   4978   5215   5227   5495   5503   5561
            5567   5598   5608   5695   5704
$ZEROS    686#
$$CMRE    893#    932    933    934    935    936    937
$$CMTM    893#    938    939    940    941    942
$$ESCA    829#
$$NEWT    829#   2986   3012   3037   3063   3093   3136   3179   3238   3291   3315   3339   3375   3409   3454
            3513   3566   3619   3672   3726   3786   3816   3846   3876   3907   3957   3996   4035   4074   4113
            4156   4202   4248   4315   4372   4449   4526   4603   4679   4747   4817   4919   4982   5231   5507
            5571   5612   5708
$$SCOP      1#   1717
$$SET     2242#   2253   2254   2255   2256   2257   2258   2259   2260   2261   2262   2263   2264   2265   2266
            2267
$$SKIP     829#
.EQUAT      1#    719
.HEADE      1#    686
.SETUP      1#
.$ACT1      1#    870
.$APTB      1#    948#
.$APTH      1#   1173
.$APTY      1#   1872
.$CATC      1#
.$CMTA      1#    893
.$EOP       1#   1654
.$ERRO      1#
.$ERRT      1#
.$POWE      1#   2360
.$RDOC      1#   2034
.$READ      1#   1931
.$SCOP      1#   1721
.$TRAP      1#   2219
.$TYPE      1#   1793
.$TYPO      1#

. ABS.  033730    000
```

```
 ERRORS DETECTED:  0

 CZKCE,CZKCE/NL:TOC/SOL/CRF_CZKCE.MAC,CZKCE.P11/EQ:DZDME
 RUN-TIME:  30 25 2 SECONDS
 RUN-TIME RATIO: 103/58=1.7
 CORE USED:  53K  (105 PAGES)
```