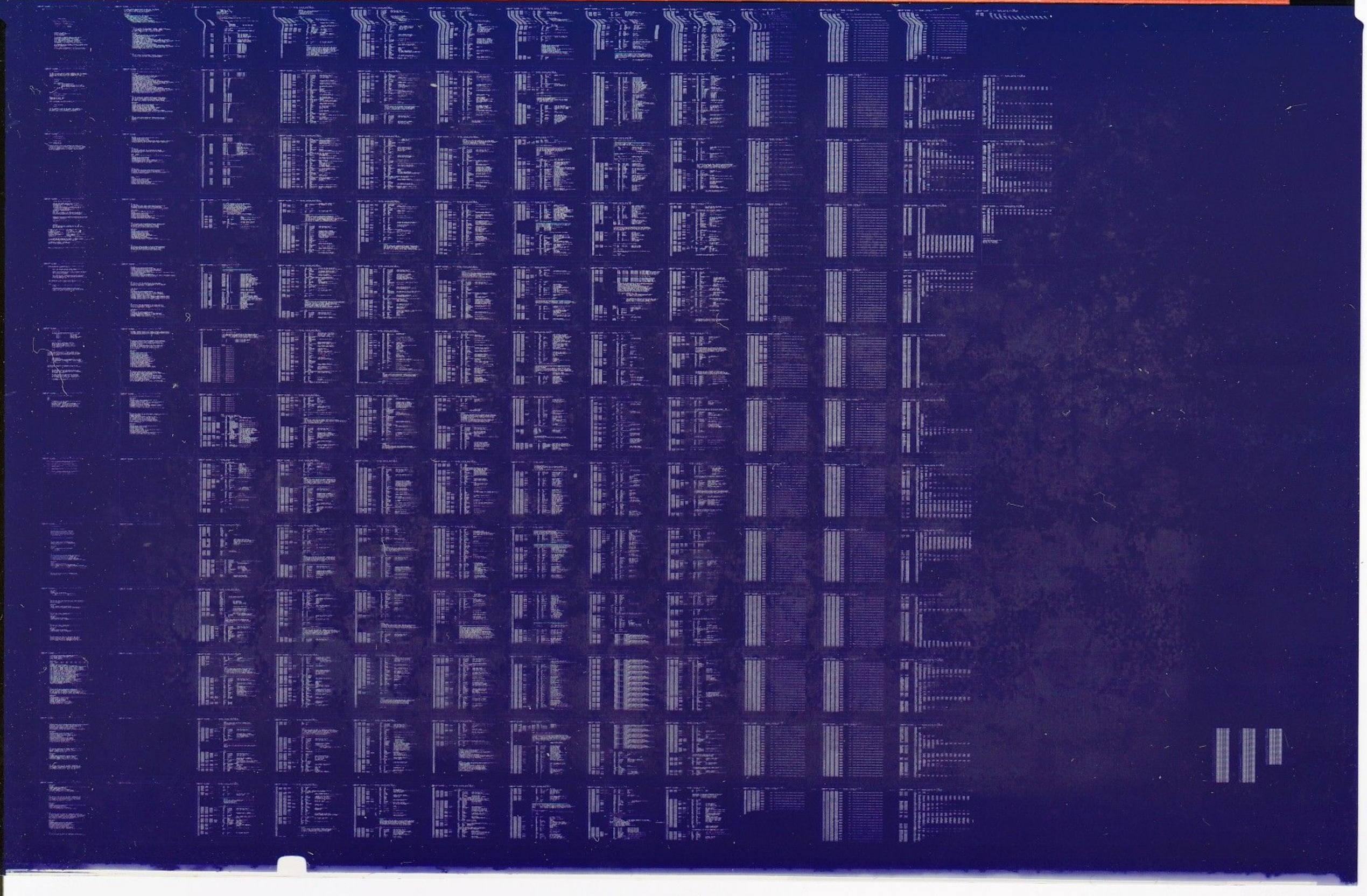
DMS11-DA

DMS11-DA DYNAMIC
CZKMEAO

AH-S886A-MC
FICHE 1 OF 1



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        .NLIST  SEQ,LOC,BIN
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IDENTIFICATION

PRODUCT CODE: AC-S884A-MC

PRODUCT NAME: CZKMEA0 DMS11-DA DYNAMIC

PROGRAM DATE: SEPTEMBER 1981

MAINTAINER: CSS/NPG DIAGNOSTICS

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1.0 ABSTRACT

THE DMS11,-D,-A,-DA LINE UNIT DYNAMIC DIAGNOSTIC TESTS THE LINE UNIT FOR BOTH CCP & BOP MODES IN THE USYRT MAINTENANCE MODE. THIS DIAGNOSTIC EXERCISES THE LINE UNIT WITH RESIDENT FIRMWARE IN THE KMC11 GENERAL PURPOSE MICROPROCESSOR. THIS DIAGNOSTIC IS A STAND ALONE PACKAGE.

2.0 REQUIREMENTS

2.1 EQUIPMENT

PDP-11 PROCESSOR
KMC11 GENERAL PURPOSE MICROPROCESSOR
NOTE: THIS DIAGNOSTIC WILL TEST UP TO 16 KMC11 GENERAL PURPOSE MICROPROCESSOR'S, BUT THEY MUST BE INSTALLED SEQUENTIALLY ON THE BUSS
DMS11-D LINE UNIT
NOTE: THIS DIAGNOSTIC WILL TEST UP TO 8 LINES PER KMC11

2.2 STORAGE

THIS DIAGNOSTIC NEEDS A MINIMUM OF 16K OF MEMORY LOCATIONS

2.3 PRELIMINARY PROGRAMS

CZKMBA0 KMC11-B STATIC PART1
CZKMCA0 KMC11-B STATIC PART2
CZKMDA0 DMS11-DA DYNAMIC

PRIOR TO EXERCISING THE DYNAMIC DIAGNOSTIC THE KMC11 MUST BE ERROR FREE. THIS DIAGNOSTIC DOES NOT TEST THE KMC11

3.0 LOADING PROCEDURE

3.1 METHOD

LOAD THE DIAGNOSTIC USING THE ABS LOADER. THIS DIAGNOSTIC IS SELF STARTING. TO RESTART THE DIAGNOSTIC LOAD ADDRESS 200 (8) AND DEPRESS START. IF THE DIAGNOSTIC IS ON MAGNETIC MEDIA, FOLLOW THE INSTRUCTIONS FOR THE MONITOR BEING USED.

4.0 STARTING PROCEDURE

4.1 STARTING ADDRESS (200)

4.2 RESTART ADDRESS

RESTART ADDRESS 200 (8)

4.3 OPERATOR ACTION

DURING THE INITIAL START UP THE DIAGNOSTIC WILL OUTPUT TO THE TELETYPE THE TITLE OF THE DIAGNOSTIC AND ENTER THE MONITOR. DURING A RESTART THE DIAGNOSTIC WILL NOT OUTPUT THE TITLE OF THE DIAGNOSTIC BUT ENTER THE MONITOR DIRECTLY. AFTER ENTRY INTO THE DIAGNOSTIC MONITOR THE OPERATOR CAN ENTER THE COMMANDS LISTED IN SECTION 4.4 OF THIS WRITEUP.

5.0 STARTING AND TEST INITIALIZATION:

LOAD AND START MEMORY ADDRESS 200 BY PRESCRIBED
METHOD AS PER PDP-11 PROCESSOR TYPE.
THE CONSOLE DEVICE WILL IDENTIFY THE DIAGNOSTIC ON THE
FIRST START UP.
THE CONSOLE MONITOR ROUTINE IS ENTERED EACH TIME ON START
UP AND OFFERS THE OPERATOR THE FOLLOWING CHOICES AS
(1) DIAG. TEST (2) CONFIGURE
TO WHICH THE OPERATOR MUST RESPOND WITH A 1 OR 2
FOLLOWED BY A CARRIAGE RETURN.

(1) DIAG. TEST
DIAG. TEST IS ENTERED IF THE CONFIGURATION ROUTINE HAS
BEEN PREVIOUSLY ENTERED AND IF NOT WILL AUTOMATICALLY
GO INTO THE CONFIGURATION ROUTINE TO SPECIFY KMC11(S) STATUS.

BEFORE EXECUTING TESTS AN OPERATOR'S WARNING MESSAGE IS PRINTED
INFORMING OF CONFIGURATINO TABLE UNITS REQUIRING EXTERNAL LOOP
CONNECTORS BE INSTALLED.

UNITS REQUIRING LOOP CONNECTORS
UNIT # 1
" "

...ETC

(2) CONFIGURE
WHEN THE CONFIGURE MODE IS ENTERED FOR THE FIRST TIME
THE CONFIGURE TABLE IS ENTERED FROM THE TOP AND THE FIRST
KMC11 IS SPECIFIED

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DEV.ADR.= (6 OCTAL CHARACTERS)  ;BUS ADDRESS OF KMC11 CSR
(1) BOP (0) CCP                 ;SELECT MODE
(1) ENABLE (0) DISABLE          ;IF 0, UNIT WON'T BE TESTED
(WARNING) NO CRC-32 TESTING     ;IF BOP WITH CRC32 & INTERNAL(***)
(1)CRC-32 (0)NO CRC             (* *)
DEV.VEC.=(3 OCTAL CHARACTERS)   ;VECTOR ADDRESS OF RECEIVE INTERRUPT
(1)EXTERNAL (0)INTERNAL         ;SELECT LOOPBACK
INT.PRI. (4-7)                  ;INTERRUPT PRIORITY LEVEL
LINES(0-7)(I.E.,#,#,#) OR (A)=ALL (N)=NONE      ;SELECT ENABLED LINES
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(* *) IF BOP MODE WAS REQUESTED THE INQUIRY IS PROMPTED AND MUST
BE ANSWERED ACCORDING TO WHETHER THE DMS11, IS A DMS11-A, DMS11-D OR DMS11-DA.
DMS11-A & DMS11-D HAVE CRC-32 AND DMS11-DA DOES NOT.

(***)MESSAGE IS PRINTED IF BOP MODE WITH CRC-32 AND OPERATOR
REQUESTS TO RUN INTERNAL LOOP BACK MODE.
DMS11-A: SELECT LINE 0 ONLY

NOTE: IF STATUS IS NOT TO BE CHANGED ON CURRENT INQUIRY A CARRIAGE
RETURN (ONLY) MAY BE TYPED

AFTER THE INPUTTING IS COMPLETED AN "*" IS PRINTED AT WHICH POINT
THE OPERATOR HAS 3 CHOICES BY TYPING AN

'E' (EXIT) THE CONFIGURE ROUTINE (ENTERS CONSOLE ROUTINE OR
DIAG. TEST IF DIAG. TEST WAS THE ENTRY POINT

'M' (MODIFY) AN M FOLLOWED BY A #1-16 (DEC) TO SPECIFY THE DESIRED
KMC11'S STATUS TO BE MODIFIED. THE STATUS BLOCK IS PRINTED
AND THE NEW STATUS INVOLKED.

"A" (ALL) FROM LAST KMC11 PARAMETER BLOCK POINTED TO EITHER BY
THE INITIAL ENTRY OR THE "MODIFY" ROUTINE THE REMAINING
BLOCKS ARE LOADED WITH THE SAME CONFIGURATION STATUS TO THE END
OF THE CONFIGURATION TABLE.

* ANY COMBINATION OF DEVICE STATUS CAN BE CONFIGURED AND RUN AS
LONG AS AT LEAST 1 KMC11 IS ENABLED IN THE TABLE

CONTROL:
TYPING A CNTR C (^C) WILL FORCE ENTRY TO THE MONITOR
ROUTINE.

PROCESSORS WITHOUT CONSOLE PANELS WILL HAVE A SOFT
SWITCH REGISTER WHICH IS INVOLKED BY THE OPERATOR TYPING
A CNTR G (^G). AFTER THE NEW SWITCH VALUE IS ENTERED THE
PROGRAM IS RESUMED AT POINT OF ^G INVOLK.

5.1 SWITCH OPTIONS:

THE SWITCH REGISTER SETTING MUST BE DONE ACCORDING TO
PROCESSOR TYPE AND HARDWARE ARCHITECT.

```
BIT15 = 1          ;HALT ON ERROR
BIT14 = 1          ;LOOP ON TEST
BIT13 = 1          ;INHIBIT ERROR TYPEOUTS
BIT10 = 1          ;RING BELL ON ERROR
BIT09 = 1          ;LOOP ON ERROR
```

TEST EXECUTION + SEQUENCES:

EACH TEST MUST BE SUCCESSIVELY COMPLETED
BEFORE THE NEXT CAN BE ENTERED. ALL TESTS
ARE RUN SEQUENTIALLY ON EACH UNIT (KMC +
DMS11D) AND THE CURRENT DEVICE IS SPECIFIED
BY THE SEQUENCE OF THE CONFIGURATION TABLE
(ENABLED UNITS ONLY).

6.0 ERRORS

ALL ERRORS ARE REPORTED ON THE TTY UNLESS CONSOLE SWITCH
13 IS SET (REFER TO SECTION 5.1 OF THIS WRITEUP). ALL ERRORS
REPORTED HAVE A ENGLISH TYPE STATEMENT EXPLAINING THE ERROR
WITH OUTPUT OF CERTAIN REGISTERS OR MEMORY LOCATIONS WHICH
CAN BE USED AS AN AID.

6.1 ERROR REPORTING:
ERROR LOGGING CONTROL IS IN ACCORDANCE WITH THE SWITCH
REGISTER SETTINGS AS DESCRIBED UNDER "SWITCH OPTIONS"
ALL ERROR REPORTS ARE HEADED BY THE FOLLOWING INFORMATION

```
  L.UNIT                    TEST                      FAIL #
(# OF FAILING UNIT) (# OF FAILING TEST) (# INDICATING THE FAILURE)
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THE ADDITIONAL FIELDS ARE IN ACCORDANCE TO THE TEST AND
DATA FIELDS OF CONCERN. THE FOLLOWING DESCRIBES THE POSSIBLE
DATA FIELDS.

SHBE = THE (SHOULD-BE) VALUE OF THE EXPECTED DATA OF THE
SUBTEST (FAIL #). THE SHBE VALUES ARE DESCRIBED IN
THE SECTION "TEST DESCRIPTIONS AND FAILE _# INFORMATION:"
WITH RESPECT TO THE FAIL #.

WAS = THE (WAS) FIELD IS THE VALUE RECEIVED PERTAINING
TO THE DATA OR STATUS UNDER TEST. THE WAS VALUES
ARE DESCRIBED IN THE SECTION "TEST DESCRIPTIONS AND
FAIL # INFORMATION:" WITH RESPECT TO THE FAIL #.

LINE # = THE NUMBER OF THE FAILING DMS11 MULTIPLEXED LINE
IN THE RANGE OF 0 THROUGH 7.

DEV. ADR. = FIRST CSR ADDRESS OF UNIT FAILING.

CSR0 =
CSR2 =
CSR4 =
CSR6 =

THE CONTENTS OF THE FOUR CONTROL AND STATUS REGISTERS
AT TIME OF DETECTED FAILURE.
NOTE: NOT ALL CSR'S CONTENTS MAY BE PERTINENT TO THE
ENCOUNTERED ERROR, THIS IS DUE TO THE NATURE OF THE
SPECIFIC PROTCOL. THE OPERATOR MUST BE FAMILIAR
WITH THE PROTCOL HANDBOOK AND REGISTER USAGE WITH
RESPECT TO THE COMMAND CURRENTLY REFLECTED IN THE CSR'S.

BUFEA = BITS 0 + 1 DISPLAY ADDRESS BITS 16 + 17 RESPECTIVELY
OF THE CURRENT BUFFER ADDRESS UNDER TEST.

BUFADR = LOW ORDER 16 BITS OF BUFFER ADDRESS UNDER TEST.

T-BUFF = TRANSMIT BUFFER ADDRESS THAT SHOULD BE RETURNED
(FROM THE KMC11).

R-BUFF = RECEIVE BUFFER ADDRESS THAT SHOULD BE RETURNED
(FROM THE KMC11)

CUR-EA = BITS 0 + 1 DISPLAY ADDRESS BIT 16 + 17 RESPECTIVELY
OF THE CURRENT BUFFER ADDRESS UNDER TEST.

CURBUF = LOW ORDER 16 BITS OF BUFFER ADDRESS UNDER TEST.

7.0 TEST INFORMATION

7.1 TEST EXECUTION + SEQUENCES:

EACH TEST MUST BE SUCCESSIVELY COMPLETED
BEFORE THE NEXT CAN BE ENTERED. ALL TESTS
ARE RUN SEQUENTIALLY ON EACH UNIT (KMC +
DMS11D) AND THE CURRENT DEVICE IS SPECIFIED
BY THE SEQUENCE OF THE CONFIGURATION TABLE
(ENABLED UNITS ONLY).

7.2 TEST DESCRIPTIONS AND FAIL # INFORMATION:

TEST 1
THIS TEST CHECKS FOR THE PRESENCE OF THE
CURRENTLY ENABLED KMC-11 BY INITIALIZING THE
FIRMWARE AND TESTING THAT THE FIRMWARE RESPONDS
BY CLEARING 'BSEL2''

ERROR REPORT:
FAIL #S.
1=KMC-11 DEVICE ADDRESS DOES NOT RESPOND
2=KMC-11 FIRMWARE FAILED TO INITIALIZE
DEV.ADDR.
(BASE ADDRESS OF FAILING UNIT)

TEST 2:
THIS TEST CHECKS THAT THE READY IN BIT (BIT7-SEL0) IS
INITIALIZED AND CONTROLLED BY THE FIRMWARE. THE READY IN
BIT IS TESTED FOR BEING INITIALLY CLEARED THEN
THE REQUEST IN BIT (BIT5-SEL0) IS SET AND READY IN
IS TESTED FOR BEING SET BY THE FIRMWARE, THEN REQUEST IN
IS CLEARED AND READY-IN TESTED FOR BEING CLEARED BY THE FIRMWARE.

ERROR REPORT:
FAIL #S
1=KMC-11 FAILED TO INITIALIZE
2=KMC-11 READY IN BIT SET WITH NOT REQUEST-IN
3=KMC-11 FIRMWARE FAILED TO SET READY-IN WHEN REQ. IN WAS SET
4=KMC-11 FIRMWARE FAILED TO CLEAR READY-IN WHEN REQ. IN WAS CLEARED
SHBE WAS
(STATUS SEL0 SHOULD BE) (STATUS SEL0 READ AS) (* IF PERTAINING)

TEST 3:
THIS TEST CHECKS THAT THE KMC-11 FIRMWARE IS NOT
REQUESTING AN OUTPUT OF ANY TYPE, BY EXAMINING BSEL2
OF THE KMC-11 CSR'S

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        ERROR REPORT
        FAIL #S
        1=FIRMWARE FAIL TO INITIALIZE
        2=KMC-11 REQ AN OUTPUT AFTER BEING INITIALIZED
                SHBE                    WAS
           (STATUS BSEL2 SHOULD BE) (STATUS BSEL2 READ AS)



    TEST 4:
        THIS TEST WILL DO A LINE INITIALIZE TO ALL LINES (SUCCESSIVELY)
        AND TEST THAT THE READY-IN BIT (BIT7-BSEL0) SETS AFTER EACH
        INITIALIZE COMMAND

        ERROR REPORT:
        FAIL #S
        1=KMC-11 FIRMWARE FAILED TO INITIALIZE
        2=CANNOT ISSUE AN INPUT COMMAND (OUTPUT REQUESTED OR RDY-IN FAILED)
        3=FIRMWARE FAILED TO COMPLETE LINE INITIALIZE COMMAND.



    TEST 5:
        THIS TEST WILL ISSUE A ''TRANSMIT BUFFER IN'' TO EACH LINE
        AND TEST THAT EACH COMMAND ACCEPTS.

        ERROR REPORT:
        FAIL #'S
        1=FIRMWARE FAILED TO INITIALIZE
        2=INPUT CANNOT BE ISSUED (FIRMWARE HUNG OR OUTPUT PENDING)
        3=XMIT BUFFER IN FAILED TO COMPLETE



    TEST 6:
        THIS TEST WILL ISSUE A ''RECEIVE BUFFER IN'' TO EACH LINE
        AND TEST THAT EACH COMMAND ACCEPTS.

        ERROR REPORT
        FAIL #'S
        1=FIRMWARE FAILED TO INITIALIZE
        2=INPUT CANNOT BE ISSUED (FIRMWARE HUNG OR OUTPUT PENDING)
        3=RECEIVE BUFFER IN FAILED TO COMPLETE



    TEST 7:
        THIS TEST CHECKS THAT EACH LINE CAN ACCEPT AND FIELD A
        TRANSMIT AND RECEIVE BUFFER.  EACH LINE IS INITIALIZED,
        THE MAINT. LOOP AND CLOCK IS ENABLED AND TWO RECEIVE
        AND ONE TRANSFMIT BUFFER ARE THEN QUEUED TO THE LINE UNDER
        TEST.  *A SERIES OF TESTS ARE PERFORMED TO CHECK THAT:
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1) THE FIRST RECEIVE BUFFER IS RETURNED WITH AN EMA (1)
STATUS AND THE CORRECT ENDING MEMORY ADDRESS,
2) THE TRANSMIT BUFFER IS RETURNED WITH A 1 STATUS AND THE
CORRECT MEMORY ADDRESS.
THE FAIL #'S RANGE FROM 1 TO 22 (OCTAL)

ERROR REPORT:
TEST # FAIL # LINE # SHBE CSR0 CSR2 CSR4 CSR6
TSTNUM ERNUM CURLIN SHBE CSR0 CSR2 CSR4 CSR6
FAIL #'S
1=FIRMWARE FAILED TO INITIALIZE *
2=CURRENT LINE FAILED TO COMPLETE LINE INITIALIZE *
3=MAINTENANCE COMMAND (START CLOCK + INTERNAL LOOP) FAILED TO COMPLETE *
4=1ST "BUFFER IN" COMMAND (RECEIVE BUFFER) FAILED TO COMPLETE *
5=2ND "BUFFER IN" COMMAND (RECEIVE BUFFER) FAILED TO COMPLETE*
6=3RD "BUFFER IN" COMMAND (TRANSMIT BUFFER) FAILED TO COMPLETE *
7=BIT 5 OF SEL2 FAILED TO SET WITHIN SPECIFIED TIME (FIRST BUFFER)
10=1ST COMMAND (SEL2) NOT PROPER RETURNED BUFFER TYPE
11=1S1 STATUS (SEL7) NOT = 1 (END COUNT REACHED)
12=1ST RETURNED LINE NUMBER IS INCORRECT (SEL3)
13=1ST ENDING BUFFER ADDRESS EXTENDED BITS (SEL7) INCORRECT
14=1ST ENDING BUFFER 16-BIT ADDRESS (SEL4) INCORRECT
15=BIT 5 OF SEL2 FAILED TO SET WITHIN SPECIFIED TIME (SECOND BUFFER)
16=2ND COMMAND (SEL2) NOT PROPER RETURNED BUFFER TYPE
17=2ND STATUS (SEL7) NOT = 1 (END COUNT REACHED)
20=2ND RETURNED LINE NUMBER IS INCORRECT (SEL3)
21=2ND ENDING BUFFER ADDRESS EXTENDED BITS (SEL7) INCORRECT
22=2ND ENDING BUFFER 16-BIT ADDRESS (SEL4) INCORRECT
*=IF ATTEMPTING AN INPUT FUNCTION AND AN OUTPUT IS PENDING
THE COMMAND IS ABANDONED AND SEL2 WILL
SHOW THE OUTPUT REQUEST, OTHERWISE IT IS ASSUMED THAT THE
FIRMWARE IS NON-RESPONSIVE

TEST 10:
THIS TEST CHECKS THAT A LINE OVERFLOW CONDITION WILL RETURN A
"CONTROL OUT" STATUS INDICATING THE LINE OVERFLOW.
EACH LINE IS TESTED FOR RETURNING THE OVERFLOW STATUS BY INITIALIZING
THE LINE, QUEUEING A 10 CHARACTER TRANSMIT BUFFER AND A 1 CHR.
RECIEVE BUFFER AND TESTING THAT A CONTROL OUT COMMAND INDICATING
A LINE OVERFLOW FOR THE CURRENT LINE IS RETURNED AFTER THE REC. BUFFER IS RETURNED

ERROR REPORT:
FAIL #'S
1=INITIALIZATION OF THIS TEST FAILED (FIRMWARE HUNG OR OUTPUT REQ.IS SET)
2=RECEIVE BUFFER IN FAILED TO LOAD
3=TRANSMIT BUFFER IN FAILED TO LOAD
4=RECEIVE BUFFER NOT RETURNED
5=CONTROL OUT COMMAND FAILED TO RETURN
6=RETURNED COMMAND (SEL2) IS NOT A CONTROL OUT
7=SEL7 DOES NOT INDICATE A LINE OVERFLOW
10=RETURNED LINE # (SEL3) IS INCORRECT.

TEST 11:
THIS TEST CHECKS THAT THE RECEIVE BUFFERS ARE KILLED BY THE "LINE RESET"
COMMAND BY INITIALIZING THE CURRENT LINE, QUEUEING A SHORT RECEIVE BUFFER
TO THE LINE, ISSUEING A "LINE RESET" COMMAND, STARTING THE
MAINTENANCE CLOCK, QUEUING A SECOND RECEIVE BUFFER TO THE LINE,
SENDING A LONGER TRANSMIT BUFFER TO THE LINE,
AND TESTING THAT A CONTROL OUT COMMAND IS RETURNED (LINE OVERFLOW
OF THE CURRENT LINE) AFTER ONE RECEIVE BUFFER OUT IS RETURNED.

ERROR REPORT:
FAIL #'S
1=INITIALIZATION OF THIS TEST FAILED ((SHBE=0)
2=RECEIVE BUFFER FIALED TO LOAD (SHBE=0)
3=CONTROL IN COMMAND (LINE RESET) CANNOT BE ISSUED (SHBE=0)
4=LINE RESET COMMAND FAILED TO COMPLETE (SHBE=0)
5=CLOCK FAILED TO START
6=2ND RECEIVE BUFFER FAILED TO LOAD (SHBE=0)
7=TRANSMIT BUFFER IN FAILED TO LOAD (SHBE=0)
10=RECEIVE BUFFER OUT WAS NOT RETURNED (SHBE=0)
11=AN OUTPUT WAS NOT RETURNED FROM THE KMC (INDICATING A LINE OVERFLOW)(SHBE=0)
12=LINE OVERFLOW BIT IN SEL7 NOT SET
13=LINE # (SEL3) NOT SAME AS LINE UNDER TEST

TEST 12:
THIS TEST WILL CHECK THAT THE TRANSMIT BUFFERS ARE KILLED BY A
LINE RESET BY INITIALIZING THE CURRENT LINE,
QUEUEING A TRANSMIT BUFFER TO THE LINE, ISSUING A LINE RESET
COMMAND, STARTING THE CLOCK, AND TESTING THAT NO
OUTPUT IS RETURNED FROM THE KMC.

ERROR REPORT:
FAIL #'S
1=FIRMWARE HUNG OR REQUESTING TO DO AN OUTPUT (SHBE=0)
2=TRANSMIT BUFFER IN FAILED TO COMPLETE (SHBE=0)
3=LINE RESET COMMAND FAILED TO COMPLETE (SHBE=0)
4=MAINTENANCE COMMAND FAILED TO START CLOCK (SHBE=0)
5=AN OUTPUT COMMAND WAS RETURNED FROM THE KMC (SHBE=0)

TEST 13:
THIS TEST WILL CHECK THAT THE "IN ABORT" COMMAND DOES NOT
TERMINATE ANY OF THE TRANSMIT BUFFERS BY INITIALIZING EACH
LINE, SENDING A TRANSMIT BUFFER TO THE LINE THEN ISSUEING
A LINE ABORT "IN" (BIT1 SEL7=1) TO THE LINE, AND TESTING
THAT THE NORMAL XMIT BUFFER OUT (EMA) IS RETURNED.

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            ERROR REPORT:
            FAIL #'S
            1=FIRMWARE HUNG OR AN OUTPUT REQUEST PENDING IN TEST SETUP ROUTINES
            2=BUFFER IN FAILED TO COMPLETE
            3=ABORT COMMAND CANNOT BE ISSUED
            4=LINE ABORT COMMAND FAILED TO COMPLETE
            5=NO OUTPUT REQUESTED AFTER THE ABORT COMMAND
            6=STATUS ON XMIT BUFFER OUT IS NOT ENDING MEMORY ADDRESS (1)



        TEST 14:
            THIS TEST WILL CHECK THAT THE ''OUT ABORT'' COMMAND DOES NOT
            TERMINATE ANY OF THE RECEIVE BUFFERS BY INITIALIZING EACH
            LINE, SENDING A RECEIVE BUFFER TO THE LINE, THEN ISSUEING
            A LINE ABORT ''OUT'' (BIT1 SEL7=1) TO THE LINE, AND TESTING
            THAT NO STATUS (BUFFER OUTS) IS RETURNED.


            ERROR REPORT:
            FAIL #'S
            1=FIRMWARE HUNG OR AN OUTPUT REQUEST PENDING IN TEST SETUP ROUTINES
            2=BUFFER IN FAILED TO COMPLETE
            3=ABORT COMMAND CANNOT BE ISSUED
            4=LINE ABORT COMMAND FAILED TO COMPLETE
            5=OUTPUT IS BEING REQUESTED AFTER THE ABORT COMMAND



        TEST 15:
            THIS TEST WILL CHECK AN ''ABORT OUT'' COMMAND WILL RETURN (KILL)
            THE BUFFER CURRENTLY QUEUED TO THE LINE UNDER TEST, BY INITIALIZING
            ALL LINES, SENDING A TRANSMIT BUFFER TO EACH LINE, THEN ISSUEING
            A LINE ABORT OUT COMMAND TO EACH LINE INDIVIDUALLY, TESTING THAT
            ONLY THE BUFFER QUEUED TO THAT LINE IS RETURNED WITH A
            STATUS (SEL6) OF (-6) ''TERMINATED ON REQUEST''.

            ERROR REPORT:
            FAIL #'S
            1=FIRMWARE HUNG OR OUTPUT REQ. WHEN INITIALLY SETTING UP TEST
            2=TRANSMIT BUFFER IN FAILED TO LOAD (SHBE=0)
            3=ABORT COMMAND CANNOT BE ISSUED (SHBE=0)
            4=THE ABORT COMMAND FAILED TO COMPLETE (SHBE=0)
            6=NO ABORTED BUFFER RETURNED (SHBE=0)
            7=COMMAND OUT NOT VALID AS PER SEL0 (SHBE=SEL0)
            10=LINE # RETURNED NOT CORRECT (SHBE=LINE #)
            11=STATUS RETURNED (SEL6) NOT ''TERMINATED ON REQ.''(-6) (SHBE=-6)



        TEST 16:
            THIS TEST WILL CHECK AN ''ABORT IN'' COMMAND WILL RETURN (KILL)
            THE BUFFER CURRENTLY QUEUED TO THE LINE UNDER TEST BY INITIALIZING
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ALL LINES, SENDING A RECEIVE BUFFER TO EACH LINE, THEN ISSUEING
A LINE "ABORT IN" COMMAND TO EACH LINE INDIVIDUALLY, TESTING THAT
ONLY THE BUFFER QUEUED TO THAT LINE IS RETURNED WITH A
STATUS (SEL6) OF (-6) "TERMINATED ON REQUEST".

ERROR REPORT:
FAIL #'S
1=FIRMWARE HUNG OR OUTPUT REQ. WHEN INITIALLY SETTING UP TEST
2=RECEIVE BUFFER IN FAILED TO LOAD (SHBE=0)
3=ABORT COMMAND CANNOT BE ISSUED (SHBE=0)
4=THE ABORT COMMAND FAILED TO COMPLETE (SHBE=0)
5=PRIMING TRANSMIT BUFFER IN FAILED TO COMPLETE (CCP ONLY)
6=NO ABORTED BUFFER RETURNED (SHBE=0)
7=COMMAND OUT NOT VALID AS PER SEL2 (SHBE=SEL2)
10=LINE # RETURNED NOT CORRECT (SHBE=LINE #)
11=STATUS RETURNED (SEL6) NOT "TERMINATED ON REQ."(-6) (SHBE=-6)
12=PRIMING TANSMIT BUFFER FAILED TO RETURN (CCP ONLY)

TEST 17:
THIS TEST CHECKS THAT AN ALTERNATE "TRANSMIT" BUFFER CAN BE QUEUED
TO EACH LINE AND IS RETURNED WHEN A LINE ABORT COMMAND
IS ISSUED. AFTER EACH LINE IS TESTED FOR RETURNING ITS
BUFFERS, AN ALTERNATE BUFFER IS QUEUED TO THE LINE

ERROR REPORT:
FAIL #'S
1=FIRMWARE HUNG OR OUTPUT REQ. ON INITIAL TEST SETUP ROUTINES
2=1ST TRANSMIT BUFFER IN FAILED TO LOAD (SHBE=0)
3=ALTERNATE TRNASMIT BUFFER FAILED TO LOAD
4=ABORT COMMAND CANNOT BE ISSUED
5=LINE ABORT COMMAND FAILED TO COMPLETE
7=NO RESPONSE (OUTPUT) AFTER ABORTING BUFFER (1ST BUFFER) (SHBE=200)
10=OUTPUT NOT A BUFF OUT OR BIT2-SEL2 SHOWS INCORRECT BUFFER TYPE (1ST BUFF) (SHBE=200)
11=LINE NUMBER (SEL3) OF RETURNED BUFF INCORRECT (1ST BUFFER) (SHBE=LINE #)
12=RETURNED BUFFER STATUS (SEL6) NOT A -6 (1ST BUFFER) (SHBE=-6)
14=2ND ABORT COMMAND CANNOT BE ISSUED
15=2ND LINE ABORT COMMAND FAILED TO COMPLETE
17=NO RESPONSE (OUTPUT) AFTER ABORTING BUFFER (2ND BUFFER) (SHBE=200)
20=OUTPUT NOT A BUFF OUT OR BIT2-SEL2 SHOWS INCORRECT BUFFER TYPE (2ND BUFF) (SHBE=200)
21=LINE NUMBER (SEL3) OF RETURNED BUFF INCORRECT (2ND BUFFER) (SHBE=LINE #)
22=RETURNED BUFFER STATUS (SEL6) NOT A -6 (2ND BUFFER) (SHBE=-6)
24=LAST ALTERNATE BUFFER FAILED TO LOAD

TEST 20:
THIS TEST CHECKS THAT AN ALTERNATE "RECEIVE" BUFFER CAN BE QUEUED
TO EACH LINE AND IS RETURNED WHEN A LINE ABORT COMMAND
IS ISSUED. AFTER EACH LINE IS TESTED FOR RETURNING ITS

BUFFERS, AN ALTERNATE BUFFER IS QUEUED TO THE LINE

ERROR REPORT:
FAIL #'S
1=FIRMWARE HUNG OR OUTPUT REQ. ON INITIAL TEST SETUP ROUTINES
2=1ST TRANSMIT BUFFER IN FAILED TO LOAD (SHBE=0)
3=ALTERNATE TRNASMIT BUFFER FAILED TO LOAD
4=ABORT COMMAND CANNOT BE ISSUED
5=LINE ABORT COMMAND FAILED TO COMPLETE
6=PRIMING TRANSMIT BUFFER FAILED TO LOAD (CCP ONLY)
7=NO RESPONSE (OUTPUT) AFTER ABORTING BUFFER (1ST BUFFER) (SHBE=200)
10=OUTPUT NOT A BUFF OUT OR BIT2-SEL2 SHOWS INCORRECT BUFFER TYPE (1ST BUFF) (SHBE=200)
11=LINE NUMBER (SEL3) OF RETURNED BUFF INCORRECT (1ST BUFFER) (SHBE=LINE #)
12=RETURNED BUFFER STATUS (SEL6) NOT A -6 (1ST BUFFER) (SHBE=-6)
13=PRIMING TRANSMIT BUFFER NOT RETURNED (CCP ONLY)
14=2ND ABORT COMMAND CANNOT BE ISSUED
15=2ND LINE ABORT COMMAND FAILED TO COMPLETE
16=2ND PRIMING TRANSMIT BUFFER FAILED TO LOAD (CCP ONLY)
17=NO RESPONSE (OUTPUT) AFTER ABORTING BUFFER (2ND BUFFER) (SHBE=200)
20=OUTPUT NOT A BUFF OUT OR BIT2-SEL2 SHOWS INCORRECT BUFFER TYPE (2ND BUFF) (SHBE=200)
21=LINE NUMBER (SEL3) OF RETURNED BUFF INCORRECT (2ND BUFFER) (SHBE=LINE #)
22=RETURNED BUFFER STATUS (SEL6) NOT A -6 (2ND BUFFER) (SHBE=-6)
23=2ND PRIMING TRANSMIT BUFFER NOT RETURNED (CCP ONLY)
24=LAST ALTERNATE BUFFER FAILED TO LOAD

TEST 21:
THIS TEST CHECKS THAT ALTERNATE BUFFERS CAN BE QUEUED TO EACH
LINE AND ARE PROPERLY HANDLED BY THE FIRMWARE. A PROGRESSION IS
DONE, TESTING THE QUEUEING OF ALTERNATE BUFFERS TO EACH LINE
THE CURRENT LINE IS QUEUED 2 RECEIVE AND 2 TRANSMIT BUFFERS
AND A TEST THAT THE BUFFERS FOR THE CURRENT LINE ARE RETURNED CORRECTLY.

ERROR REPORT:
FAIL #'S
1=FAILURE IN TEST INITIALIZATION ROUTINES (SHBE=0)
2=RECEIVE BUFFER FAILED TO LOAD (SHBE=0)
3=TRANSMIT BUFFER FAILED TO LOAD (SHBE=0)
4=OUTPUT REQ. NOT SET (BUFFER NOT RETURNED) (SHBE=0)
5=WRONG LINE NUMBER RETURNED (SHBE=CURRENT LINE #)
6=WRONG STATUS RETURNED (SHBE=CORRECT STATUS)
7=RETURNED BUFFER ADDRESS NOT CORRECT (SHBE=CORRECT ADDRESS)
10=THERE HAVE BEEN 4 BUFFERS OUT BUT NOT 2 RX + 2 TX (SHBE=# OF RX BUFFERS)
11=AFTER 4 BUFFERS ANOTHER REQ.OUT IS POSTED (SHBE=# OF RX BUFFERS SO FAR)

TEST 22:
THIS TEST CHECKS THAT A NON-EXISTANT MEMORY STATUS (-5) WILL BE
RETURNED WITH A RECEIVE BUFFER OUT. THE NON-EXISTANT MEMORY
LOCATION IS I/O PAGE LOCATION 10 TO WHICH THE RECEIVE BUFFER IS
ADDRESSED.

ERROR REPORT:

```
        FAIL #'S
        1=FAILURE IN TEST INITIALIZATION ROUTINES (SHBE=0)
        2=RECEIVE BUFFER FAILED TO LOAD
        3=TRANSMIT BUFFER FAILED TO LOAD
        4=NO OUTPUT RESPONSE FROM THE (NON-EXISTANT MEMORY) TRANSFER. (SHBE=204 (SEL2))
        5=OUTPUT RESPONSE NOT FROM A RETURNED RECEIVE BUFFER (SHBE=204(SEL2))
        6=RETURNED RECEIVE BUFFER STATUS NOT CORRECT (SHBE=-5 (NXM-STATUS))



    TEST 23:
        CCP MODE ONLY
        THIS TEST WILL CHECK THAT THE 2 CHARACTERS ETX AND ETB
        ARE DETECTED AND PROPERLY RETURN THE BUFFER OUT COMMAND STATUS.
        BOTH CHARACTERS ARE TESTED INDIVIDUALLY WITH EACH PREFIXED
        BY AN SOH THEN A STX

        ERROR   REPORT:
        WAS = LOW BYTE = SOH OR STX HIGH BYTE = ETX OR ETB (FAILING COMBINATION)
        FAIL#S
        1=FAILURE IN TEST SET UP ROUTINES
        2=RECEIVE BUFFER FAILED TO LOAD
        3=TRANSMIT BUFFER FAILED TO LOAD
        4=NO RESPONSE WAS RECEIVED FROM THE TERMINATION CHARACTER
        5=RETURNED COMMAND IS NOT A RECEIVE BUFFER OUT
        6=BUFFER RETURNED DOES NOT HAVE CORRECT ENDING MEMORY ADDRESS
        7=SEL6 RETURNED STATUS IS NOT CORRECT



    TEST 24:
        CCP MODE ONLY
        THIS TEST CHECKS THAT AN LRC ERROR CONDITION CAN BE DETECTED
        AND RETURNS THE RECEIVE BUFFER WITH AN LRC CONDITION
        TO GENERATE THE LRC ERROR A SPECIALLY FORMATTED BUFFER IS OUTPUT WITH
        AN ADDITIONAL CHARACTER FOLLOWING THE "ETX" WHICH THE RECEIVER
        INTERPRETS AS THE LRC CHARACTER


        ERROR   REPORTS:
        FAIL#S
        1=FAILURE IN TEST INITIALIZE ROUTINE
        2=RECEIVE BUFFER FAILED TO LOAD
        3=TRANSMIT BUFFER FAILED TO LOAD
        4=THERE IS NO OUTPUT RESPONSE FROM THE LRC ERROR CONDITION
        5=OUTPUT IS NOT A BUFFER OUT COMMAND
        6=RETURNED ENDING MEMORY ADDRESS NOT CORRECT
        7=RETURNED STATUS DOES NOT INDICATE AN LRC ERROR
```

TEST 25:
CCP MODE ONLY
THIS TEST CHECKS THAT A PARITY ERROR CONDITION CAN BE DETECTED
AND RETURNS THE RECEIVE BUFFER WITH A PARITY CONDITION.
TO GENERATE THE PARITY ERROR A SPECIALLY FORMATTED BUFFER IS OUTPUT
WITH AN EVEN PARITY DATA CHARACTER FOLLOWING THE CONTROL CHARACTERS

ERROR REPORTS:
UNIT# TEST# FAIL# SHBE CSR0 CSR2 CSR4 CSR6
FAIL #S
1=FAILURE IN TEST INITIALIZATION ROUTINES
2=RECEIVE BUFFER FAILED TO LOAD
3=TRANSMIT BUFFER FAILED TO LOAD
4=THERE IS NO OUTPUT RESPONSE FROM THE PARITY ERROR CONDITION
5=OUTPUT IS NOT A BUFFER OUT COMMAND
6=RETURNED ENDING MEMORY ADDRESS NOT CORRECT
7=RETURNED STATUS DOES NOT INDICATE A PARITY ERROR

TEST 26:
THIS TEST CHECKS THAT THE CHARACTER COUNT WILL CORRECTLY COUNT
TO THE HIGHEST VALUE OF CORE AVAILABLE (ABOVE THE DIAGNOSTIC)
BY USING THE SAME BUFFER FOR RECEIVE AS IS TRANSMIT
AND TESTING THAT THE ENDING MEMORY ADDRESS RETURNED
OF BOTH THE BUFFERS (XMIT AND RECEIVE) ARE THE SAME

ERROR REPORT:
FAIL #'S
1=FAILURE IN TEST INITIALIZATION ROUTINES
2=RECEIVE BUFFER FAILED TO LOAD
3=TRANSMIT BUFFER FAILED TO LOAD
4=NO BUFFER RETURNED FROM TRANSFER
5=COMMAND RETURNED WAS NOT A BUFFER OUT
6=1ST BUFFER HAS INCORRECT ENDING MEMORY ADDRESS
7=2ND BUFFER FAILED TO RETURN
10=2ND COMMAND WAS NOT A BUFFER OUT
11=2ND BUFFER HAD INCORRECT ENDING MEMORY ADDRESS
12=BUFFERS RETURNED WERE NOT 1 TRANSMIT & 1 RECEIVE (SHBE=# REC.BUFFERS)

TEST 27:
THIS TEST WILL CHECK THE LOWER 13 (4K) BIT TRANSMIT AND RECEIVE
BUFFER ADDRESSING (BUFFER ADDRESS-IN AND OUT) BY TRANSMITTING
AND RECEIVING TWO WORD BUFFERS. THE ADDRESSES ARE SEQUENCED BY
WALKING A ONE ACROSS THE RETURNED BUFFER ADDRESS VALUE.
THE RETURNED BUFFER ADDRESSES ARE TESTED FOR BEING CORRECT.

ERROR REPORT:

```
        FAIL #'S
        1=FAILURE IN TEST INITIALIZATION ROUTINES
        2=CURRENT RECEIVE BUFFER FAILED TO LOAD (SHBE + WAS =N/A)
        3=CURRENT TRANSMIT BUFFER FAILED TO LOAD (SHBE+WAS=N/A)
        4=NO OUTPUT RESPONSE AFTER QUEUEING BUFFERS (SHBE,WAS=N/A)
        5=1ST RETURNED BUFFER IS NOT BUFFER OUT
        6=1ST RETURNED BUFFER (ENDING MEMORY ADDRESS) NOT CORRECT (SHBE=CORRECT ADDRESS)
        7=2ND BUFFER NOT RETURNED
        10=2ND RETURNED COMMAND IS NOT BUFFER OUT
        11=2ND RETURNED BUFFER (ENDING MEMORY ADDRESS) NOT CORRECT (SHBE=CORRECT ADDRESS)
        12=TWO BUFFER OUT COMMANDS RETURNED BUT NOT ONE TX AND ONE RX (SHBE=#OF RX BUFFERS
        13=EXTRA RETURNED COMMAND AFTER TWO BUFFER OUTS



TEST 30:
    THIS TEST WILL CHECK BUS ADDRESSING OF THE HIGHER ORDER
    BITS (BITS 14-17) OF THE QUEUED RECEIVE BUFFER AND MULTIPLE DATA
    TRANSFERS BY TRANSFERRING A TEN WORD BUFFER TO EACH 4K BOUNDARY
    (IN THE TEST RANGE) OUTPUT IS FROM "TBUF"


    * THE TEST WILL EXECUTE ONLY IF SUFFICIENT CORE EXISTS.
    ERROR REPORT:
    FAIL #'S
    1=FAILURE IN TEST INITIALIZATION ROUTINES
    2=THE RECEIVE BUFFER-IN COMMAND FAILED TO LOAD (SHBE,WAS=0)
    3=THE TRANSMIT BUFFER-IN COMMAND FAILED TO LOAD (SHBE,WAS=0)
    4=CURRENT TRANSFER FAILED TO INDICATE A COMPLETION (SHBE,WAS=0)
    5=RETURNED COMMAND WAS NOT A BUFFER OUT
    6=RETURNED (TRANSMIT) BUFFER EA-BITS INCORRECT (SHBE+WAS=EA-BIT STATUS)
    7=RETURNED (TRANSMIT) BUFFER 16 BIT ADDRESS INCORRECT (SHBE+WAS=ADDRESS)
    10=RETURNED (RECEIVE) BUFFER EA-BITS INCORRECT (SHBE+WAS=EA-BIT STATUS)
    11=RETURNED (RECEIVE) BUFFER 16 BIT ADDRESS INCORRECT (SHBE+WAS=ADDRESS)
    12=TWO RETURNED BUFFERS WERE NOT 1 TX AND 1 RX BUFFER



TEST 31:
    THIS TEST WILL CHECK BUS ADDRESSING OF THE HIGHER ORDER BITS
    (BITS 14-17) OF THE QUEUED TRANSMIT BUFFER AND MULTIPLE DATA
    TRANSFERS BY TRANSFERRING A TEN WORD BUFFER FROM EACH 4K BOUNDARY
    (IN THE TEST RANGE) INPUT IS TO RBUF.

    * THE TEST WILL EXECUTE ONLY IF SUFFICIENT CORE EXISTS.
    ERROR REPORT:
    FAIL #'S
    1=FAILURE IN TEST INITIALIZATION ROUTINES
    2=THE RECEIVE BUFFER-IN COMMAND FAIL TO LOAD (SHBE,WAS=0)
    3=THE TRANSMIT BUFFER-IN COMMAND FAIL TO LOAD (SHBE,WAS=0)
    4=CURRENT TRANSFER FAILED TO INDICATE A COMPLETION (SHBE,WAS=0)
    5=RETURNED COMMAND IS NOT A BUFFER OUT
    6=RETURNED (TRANSMIT) BUFFER EA-BITS INCORRECT (SHBE+WAS=EA-BIT STATUS)
```

```
            7=RETURNED (TRANSMIT) BUFFER 16 BIT ADDRESS INCORRECT (SHBE+WAS=ADDRESS)
            10=RETURNED (RECEIVE) BUFFER EA-BITS INCORRECT (SHBE+WAS=EA-BIT STATUS)
            11=RETURNED (RECEIVE) BUFFER 16 BIT ADDRESS INCORRECT (SHBE+WAS=ADDRESS)
            12=TWO RETURNED BUFFERS WERE NOT 1 TX AND 1 RX BUFFER



      TEST 32:
            THIS TEST WILL CHECK MULTIPLE DATA TRANSFERS AND BUS ADDRESSING
            BY TRANSFERRING BUFFERS TO EACH INCREMENTAL 4K ABOVE THE DIAGNOSTIC
            IN CCP MODE, THE FIRST 4K BOCK (16-20K) IS WRITTEN WITH AN
            INCREMENTAL PATTERN (40-175) AND TRANSFERRED TO EACH 4K ABOVE
            THE DIAGNOSTIC (20K UP)
            IN BOP MODE, THE FIRST 1024 BYTES OF THE FIRST 4K BOCK (16K) IS
            WRITTEN WITH AN INCREMENTAL PATTERN (0-377) AND TRANSFERRED
            TO THE START OF EACH 4K ABOVE THE DIAGNOSTIC (20K UP)
            TEST WILL RUN ONLY IF 20K OR MORE OF CONTIGUOUS CORE (0 UP)
            EXISTS ON SYSTEM.

            ERROR REPORT:
            FAIL #'S
            1=FAILURE IN TEST INITIALIZATION ROUTINES
            2=RECEIVE BUFFER FAILED TO LOAD
            3=TRANSMIT BUFFER FAILED TO LOAD
            4=NO BUFFER RETURNED FROM TRANSFER
            5=1ST RETURN WAS NOT A BUFFER OUT
            6=TRANSMIT BUFFER RETURN STATUS INCORRECT
            7=16-BIT TRANSMIT ADDRESS INCORRECT
            10=EXTENDED TRANSMIT ADDRESS BITS INCORRECT
            11=2ND BUFFER (RECEIVE) NOT RETURNED
            12=2ND RETURN WAS NOT EXPECTED RECEIVE BUFFER
            13=RECEIVE BUFFER RETURNED STATUS INCORRECT
            14=16-BIT RECEIVE ADDRESS INCORRECT
            15=EXTENDED RECEIVE ADDRESS BITS INCORRECT
            16=RECEIVED DATA CHARACTER INCORRECT
            17=2ND BUFFER (TRANSMIT) NOT RETURNED
            20=2ND RETURN WAS NOT EXPECTED TRANSMIT BUFFER
            21=TWO RETURNED BUFFERS NOT 1TX AND 1 RX BUFFER


      TEST 33:
            THIS TEST WILL CHECK THE INPUT REQUEST INTERRUPT LOGIC
            AND FIRMWARE ARBITRATION BY INITIALIZING THE INPUT REQUEST
            VECTOR (XX0) WITH A CORRECT RETURN ADDRESS AND THE OUTPUT REQUEST
            VECTOR WITH ADDRESS TO ERROR FLAG ROUTINE.
            THE INPUT REQUEST IS FIRST DONE WITH THE PROCESSOR STATUS
            DROPPED TO 0 AND THE INTERRUPT ENABLE BIT NOT SET TO CHECK
            THAT NO INTERRUPT OCCURS WHEN THE 'RDYIN' (BIT 7-SEL0) SETS.
            THEN THE INPUT REQUEST IS MADE WITH THE INTERRUPT ENABLE
            BIT SET AND THE PROCESSOR STATUS AT 0 TO CHECK THAT THE INTERRUPT
            OCCURS TO THE CORRECT VECTOR ADDRESS
            THEN THE PROCESSOR STATUS IS SET TO LEVEL 7 THE REQUEST MADE
            WITH THE INTERRUPT ENABLE BIT SET AND TEST THAT THE INTERRUPT DOES
```

```
                NOT OCCUR UNTIL THE CORRECT PROCESSOR STATUS IS REACHED.

                ERROR REPORT:
                FAIL #'S
                1=FAILURE IN TEST INITIALIZATION ROUTINES (WAS=N/A)
                2="RDY-IN" FAILED TO SET (WAS=N/A
                3=ILLEGAL INTERRUPT OCCURED ( W/PS @ 7) (WAS=VECTOR TRAPPED TO)
                4=FIRMWARE INITIALIZE FAILED AFTER RDYIN SET (WAS=N/A)
                5=2ND RDYIN FAILED TO SET (WAS=N/A)
                6=INTERRUPTED TO WRONG VECTOR ADDRESS (WAS=VECTOR TRAPPED TO)
                7=FIRMWARE FAILED TO INIT. AFTER INPUT INTERRUPT (WAS=N/A)
                10=3RD RDY-IN FAILED TO SET (WAS=N/A)
                11=INTERRUPT OCCURED AT LEVEL OTHER THAN SPECIFIED (WAS=PS WORD)



        TEST 34:
                THIS TEST WILL CHECK THAT AN OUTPUT REQUEST INTERRUPT CAN CORRECTLY BE
                EXECUTED TO INTERRUPT VECTOR XX4 AND TEST THE LOGIC AND
                FIRMWARE ARBITRATION.
                A TRANSMIT AND RECEIVE BUFFER IS QUEUED TO LINE 0
                WITH THE PROCESSOR STATUS AT 0 AND THE "IEO" BIT NOT SET
                TEST IS DONE TO CHECK THAT NO INTERRUPT OCCURS.
                THE FIRMWARE IS REINITIALIZED THE BUFFERS REQUEUED
                WITH THE "IEO" BIT SET AND THE PROCESSOR STATUS AT 0
                A CHECK IS DONE TO TEST THAT THE INTERRUPT OCCURS TO THE
                OUTPUT VECTOR ADDRESS XX4.

                ERROR REPORT:
                FAIL #'S
                1=FAILURE IN TEST INITIALIZATION ROUTINES (WAS=N/A)
                2=RECEIVE BUFFER FAILED TO LOAD
                3=TRANSMIT BUFFER FAILED TO LOAD
                4=BUFFER FAILED TO RETURN
                5=ILLEGAL INTERRUPT WITHOUT IEO SET (WAS=VECTOR TRAPPED TO)
                6=2ND RECEIVE BUFFER FAILED TO LOAD
                7=2ND XMIT BUFFER FAILED TO LOAD
                10=INTERRUPT OCCURED TO WRONG VECTOR (WAS=VECTOR TRAPPED TO)
                11=INTERRUPT FIALED WHEN "RDYOUT" SET (WAS=N/A)
                12=BUFFER FAILED TO RETURN (NO "RDYOUT") (WAS=N/A)
        !
```

```
        .NLIST MD
```

```
                        .LIST SEQ,BIN,LOC
                              .ENABL  ABS,AMA
                        .TITLE  CZKMEA0 DMS11-DA DYNAMIC
                        ;*COPYRIGHT (C) 1981
                        ;*DIGITAL EQUIPMENT CORP.
                        ;*MAYNARD, MASS. 01754
                        ;*
                        ;*PROGRAM BY R.BALDWIN, R. J. COLLINS
                        ;*
                        ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
                        ;*PACKAGE (MAINDEC-11-DZQAC-C5), JAN, 1981.
                        ;*
000001                  $TN=1
160000                  $SWR=160000     ;;HALT ON ERROR, LOOP ON TEST, INHIBIT ERROR TYPOUT
167400                          $SWR=167400
000001                          $TN=1
000001                          $N=1
000001                          $E=1
022626                          POP2SP=22626
022626                          POPPOP=22626            ;POP THE STACK TWICE
005726                          POPSP=005726            ;POP THE STACK ONCE
                        .SBTTL  BASIC DEFINITIONS

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

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

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

                        ;*PRIORITY LEVEL DEFINITIONS
000000                  PR0=    0               ;;PRIORITY LEVEL 0
000040                  PR1=    40              ;;PRIORITY LEVEL 1
000100                  PR2=    100             ;;PRIORITY LEVEL 2
```

```
1124            000140                  PR3=    140             ;;PRIORITY LEVEL 3
1125            000200                  PR4=    200             ;;PRIORITY LEVEL 4
1126            000240                  PR5=    240             ;;PRIORITY LEVEL 5
1127            000300                  PR6=    300             ;;PRIORITY LEVEL 6
1128            000340                  PR7=    340             ;;PRIORITY LEVEL 7
1129
1130                                    ;*''SWITCH REGISTER'' SWITCH DEFINITIONS
1131            100000                  SW15=   100000
1132            040000                  SW14=   40000
1133            020000                  SW13=   20000
1134            010000                  SW12=   10000
1135            004000                  SW11=   4000
1136            002000                  SW10=   2000
1137            001000                  SW09=   1000
1138            000400                  SW08=   400
1139            000200                  SW07=   200
1140            000100                  SW06=   100
1141            000040                  SW05=   40
1142            000020                  SW04=   20
1143            000010                  SW03=   10
1144            000004                  SW02=   4
1145            000002                  SW01=   2
1146            000001                  SW00=   1
1147                                    .EQUIV  SW09,SW9
1148                                    .EQUIV  SW08,SW8
1149                                    .EQUIV  SW07,SW7
1150                                    .EQUIV  SW06,SW6
1151                                    .EQUIV  SW05,SW5
1152                                    .EQUIV  SW04,SW4
1153                                    .EQUIV  SW03,SW3
1154                                    .EQUIV  SW02,SW2
1155                                    .EQUIV  SW01,SW1
1156                                    .EQUIV  SW00,SW0
1157
1158                                    ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
1159            100000                  BIT15=  100000
1160            040000                  BIT14=  40000
1161            020000                  BIT13=  20000
1162            010000                  BIT12=  10000
1163            004000                  BIT11=  4000
1164            002000                  BIT10=  2000
1165            001000                  BIT09=  1000
1166            000400                  BIT08=  400
1167            000200                  BIT07=  200
1168            000100                  BIT06=  100
1169            000040                  BIT05=  40
1170            000020                  BIT04=  20
1171            000010                  BIT03=  10
1172            000004                  BIT02=  4
1173            000002                  BIT01=  2
1174            000001                  BIT00=  1
1175                                    .EQUIV  BIT09,BIT9
1176                                    .EQUIV  BIT08,BIT8
1177                                    .EQUIV  BIT07,BIT7
1178                                    .EQUIV  BIT06,BIT6
1179                                    .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
                        .SBTTL  MEMORY MANAGEMENT DEFINITIONS

                        ;*KT11 VECTOR ADDRESS

000250                  MMVEC=  250

                        ;*KT11 STATUS REGISTER ADDRESSES

177572                  SR0=    177572
177574                  SR1=    177574
177576                  SR2=    177576
172516                  SR3=    172516

                        ;*KERNEL "I" PAGE DESCRIPTOR REGISTERS

172300                  KIPDR0= 172300
172302                  KIPDR1= 172302
172304                  KIPDR2= 172304
172306                  KIPDR3= 172306
172310                  KIPDR4= 172310
172312                  KIPDR5= 172312
172314                  KIPDR6= 172314
172316                  KIPDR7= 172316

                        ;*KERNEL "I" PAGE ADDRESS REGISTERS

172340                  KIPAR0= 172340
172342                  KIPAR1= 172342
172344                  KIPAR2= 172344
172346                  KIPAR3= 172346
172350                  KIPAR4= 172350
172352                  KIPAR5= 172352
172354                  KIPAR6= 172354
172356                  KIPAR7= 172356

                        .SBTTL  TRAP CATCHER
```

```
1236            000000                          .=0
1237                                            ;*ALL UNUSED LOCATIONS OF THE VECTOR AREA CONTAIN
1238                                            ;*A ".+2, IOT" SEQUENCE TO CATCH AND PROCESS ILLEGAL
1239                                            ;*TRAPS AND INTERRUPTS THAT MIGHT OCCUR.
1240                                            ;*THE IOT TRAP WHICH IS TAKEN ON THE ILLEGAL TRAP/INT
1241                                            ;*TRAPS TO THE $SCOPE ROUTINE WHICH (IF THE RETURN PC IS
1242                                            ;*LESS THAN 1002) JUMPS TO THE $ERROR ROUTINE.
1243                                            ;*THE $ERROR ROUTINE WILL REPORT THE ERROR AS FOLLOWS:
1244                                            ;*      PC=YYYYYY UNEXPECTED TRAP TO XXX
1245                                            ;*AND RETURN TO THE PROGRAM AT PC=YYYYYY+2
1246                                            ;*WHERE XXX=LOCATION OF ILLEGAL TRAP
1247                                            ;*      YYYYYY=PC AT TIME OF TRAP
1248                                            ;*NOTE: IF THE PROCESSOR IS NOT AN 11/05 THE PROGRAM
1249                                            ;*      CAN BE STARTED AT ADDRESS 0 AS WELL AS ADDRESS 200.
1250
1251  000000  000000                $40CAT: HALT                    ;;HALT
1252  000002  000737                        BR      .-100           ;;BRANCH TO 177700 & TIME OUT (NOT ON
1253                                                                ;;11/05)
1254  000004  001542                        .WORD   BEGIN           ;;VECTOR TO STARTING ADDRESS
1255  000006  000340                        .WORD   340             ;;WITH PRIORITY LEVEL 7
1256            000174                      .=174
1257  000174  000000                DISPREG:.WORD   0               ;;SOFTWARE DISPLAY REGISTER
1258  000176  000000                SWREG:  .WORD   0               ;;SOFTWARE SWITCH REGISTER
1259                                  .SBTTL  STARTING ADDRES(ES)
1260  000200  000137  001542               JMP     @#BEGIN ;;GO TO START OF PROGRAM
1261            000220                      .=220
1262  000220  000240                        NOP                     ;ALLOW INSERTION OF KMC DEBUF DUMP
1263  000222  000240                        NOP
1264  000224  000137  002076               JMP     MONIT           ;RETURN TO MONITOR
```

```
                        .SBTTL  COMMON TAGS

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

                001100          .=1100
001100                  $CMTAG:                         ;;START OF COMMON TAGS
001100  000000          $PASS:  .WORD   0               ;;CONTAINS PASS COUNT
001102     000          $TSTNM: .BYTE   0               ;;CONTAINS THE TEST NUMBER
001103     000          $ERFLG: .BYTE   0               ;;CONTAINS ERROR FLAG
001104  000000          $ICNT:  .WORD   0               ;;CONTAINS SUBTEST ITERATION COUNT
001106  000000          $LPADR: .WORD   0               ;;CONTAINS SCOPE LOOP ADDRESS
001110  000000          $LPERR: .WORD   0               ;;CONTAINS SCOPE RETURN FOR ERRORS
001112  000000          $ERTTL: .WORD   0               ;;CONTAINS TOTAL ERRORS DETECTED
001114     000          $ITEMB: .BYTE   0               ;;CONTAINS ITEM CONTROL BYTE
001115     001          $ERMAX: .BYTE   1               ;;CONTAINS MAX. ERRORS PER TEST
001116  000000          $ERRPC: .WORD   0               ;;CONTAINS PC OF LAST ERROR INSTRUCTION
001120  000000          $GDADR: .WORD   0               ;;CONTAINS ADDRESS OF 'GOOD' DATA
001122  000000          $BDADR: .WORD   0               ;;CONTAINS ADDRESS OF 'BAD' DATA
001124  000000          $GDDAT: .WORD   0               ;;CONTAINS 'GOOD' DATA
001126  000000          $BDDAT: .WORD   0               ;;CONTAINS 'BAD' DATA
001130  000000                  .WORD   0               ;;RESERVED--NOT TO BE USED
001132  000000                  .WORD   0
001134     000          $AUTOB: .BYTE   0               ;;AUTOMATIC MODE INDICATOR
001135     000          $INTAG: .BYTE   0               ;;INTERRUPT MODE INDICATOR
001136  000000                  .WORD   0
001140  177570          SWR:    .WORD   DSWR            ;;ADDRESS OF SWITCH REGISTER
001142  177570          DISPLAY: .WORD  DDISP           ;;ADDRESS OF DISPLAY REGISTER
001144  177560          $TKS:   177560                  ;;TTY KBD STATUS
001146  177562          $TKB:   177562                  ;;TTY KBD BUFFER
001150  177564          $TPS:   177564                  ;;TTY PRINTER STATUS REG. ADDRESS
001152  177566          $TPB:   177566                  ;;TTY PRINTER BUFFER REG. ADDRESS
001154     000          $NULL:  .BYTE   0               ;;CONTAINS NULL CHARACTER FOR FILLS
001155     002          $FILLS: .BYTE   2               ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
001156     012          $FILLC: .BYTE   12              ;;INSERT FILL CHARS. AFTER A 'LINE FEED''
001157     000          $TPFLG: .BYTE   0               ;;'TERMINAL AVAILABLE'' FLAG (BIT<07>=0=YES)
001160  000000          $TMP0:  .WORD   0               ;;USER DEFINED
001162  000000          $TMP1:  .WORD   0               ;;USER DEFINED
001164  000000          $TMP2:  .WORD   0               ;;USER DEFINED
001166  000000          $TIMES: 0                       ;;MAX. NUMBER OF ITERATIONS
001170  000000          $ESCAPE:0                       ;;ESCAPE ON ERROR ADDRESS
001172  177607  000377    $BELL:  .ASCIZ  <207><377><377> ;;CODE FOR BELL
001176     077          $QUES:  .ASCII  /?/             ;;QUESTION MARK
001177     015          $CRLF:  .ASCII  <15>            ;;CARRIAGE RETURN
001200  000012          $LF:    .ASCIZ  <12>            ;;LINE FEED
                        ;;**********************************************************************
```

```
                                .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

001202                          $ERRTB:
                                ;ERROR MESSAGE TABLE

001202  033050  034446  035562           EM01,DH1,DT1,DF1
001210  036042
001212  033101  034507  035574           EM02,DH2,DT2,DF1
001220  036042
001222  033137  034507  035574           EM03,DH2,DT2,DF1
001230  036042
001232  033164  034553  035610           EM04,DH3,DT3,DF1
001240  036042
001242  033211  034612  035622           EM05,DH4,DT4,DF1
001250  036042
001252  033240  034612  035622           EM06,DH4,DT4,DF1
001260  036042
001262  033270  034707  035644           EM07,DH5,DT5,DF1
001270  036042
001272  033324  034707  035644           EM10,DH5,DT5,DF1
001300  036042
001302  033347  034707  035644           EM11,DH5,DT5,DF1
001310  036042
001312  033405  034707  035644           EM12,DH5,DT5,DF1
001320  036042
001322  033444  034612  035622           EM13,DH4,DT4,DF1
001330  036042
001332  033503  034612  035622           EM14,DH4,DT4,DF1
001340  036042
001342  033542  034707  035644           EM15,DH5,DT5,DF1
001350  036042
001352  033602  034612  035622           EM16,DH4,DT4,DF1
001360  036042
001362  033641  034707  035644           EM17,DH5,DT5,DF1
001370  036042
001372  033702  034707  035644           EM20,DH5,DT5,DF1
001400  036042
001402  033742  034707  035644           EM21,DH5,DT5,DF1
001410  036042
001412  034001  034707  035644           EM22,DH5,DT5,DF1
001420  036042
001422  034021  035260  035750           EM23,DH11,DT11,DF1
001430  036042
001432  034054  034707  035644           EM24,DH5,DT5,DF1
```

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1368  001440  036042
1369  001442  034106  034707  035644          EM25,DH5,DT5,DF1
1370  001450  036042
1371  001452  034143  034707  035644          EM26,DH5,DT5,DF1
1372  001460  036042
1373  001462  034170  035454  036016          EM27,DH13,DT13,DF1
1374  001470  036042
1375  001472  034222  035164  035726          EM30,DH10,DT10,DF1
1376  001500  036042
1377  001502  034275  035164  035726          EM31,DH10,DT10,DF1
1378  001510  036042
1379  001512  034350  035260  035750          EM32,DH11,DT11,DF1
1380  001520  036042
1381  001522  034373  035365  035774          EM33.DH12,DT12,DF1
1382  001530  036042
1383  001532  034420  035365  035774          EM34,DH12,DT12,DF1
1384  001540  036042
1385
1386
1387  001542                                BEGIN:
1388                                        .SBTTL  INITIALIZE THE COMMON TAGS
1389                                        ;;CLEAR THE COMMON TAGS ($CMTAG) AREA
1390  001542  012706  001100                       MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
1391  001546  005026                               CLR     (R6)+           ;;CLEAR MEMORY LOCATION
1392  001550  022706  001140                       CMP     #SWR,R6 ;;DONE?
1393  001554  001374                               BNE     .-6             ;;LOOP BACK IF NO
1394  001556  012706  001100                       MOV     #STACK,SP       ;;SETUP THE STACK POINTER
1395                                        ;;INITIALIZE A FEW VECTORS
1396  001562  012737  020550  000020               MOV     #$SCOPE,@#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
1397  001570  012737  000340  000022               MOV     #340,@#IOTVEC+2 ;;LEVEL 7
1398  001576  012737  021034  000030               MOV     #$ERROR,@#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
1399  001604  012737  000340  000032               MOV     #340,@#EMTVEC+2 ;;LEVEL 7
1400  001612  012737  024256  000034               MOV     #$TRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
1401  001620  012737  000340  000036               MOV     #340,@#TRAPVEC+2;LEVEL 7
1402  001626  013737  020462  020454               MOV     $ENDCT,$EOPCT   ;;SETUP END-OF-PROGRAM COUNTER
1403  001634  005037  001166                       CLR     $TIMES          ;;INITIALIZE NUMBER OF ITERATIONS
1404  001640  005037  001170                       CLR     $ESCAPE         ;;CLEAR THE ESCAPE ON ERROR ADDRESS
1405  001644  112737  000001  001115               MOVB    #1,$ERMAX       ;;ALLOW ONE ERROR PER TEST
1406  001652  012737  001652  001106               MOV     #.,$LPADR       ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
1407  001660  012737  001660  001110               MOV     #.,$LPERR       ;;SETUP THE ERROR LOOP ADDRESS
1408                                        ;;SIZE FOR A HARDWARE SWITCH REGISTER. IF NOT FOUND OR IT IS
1409                                        ;;EQUAL TO A "-1", SETUP FOR A SOFTWARE SWITCH REGISTER.
1410  001666  013746  000004                       MOV     @#ERRVEC,-(SP)  ;;SAVE ERROR VECTOR
1411  001672  012737  001726  000004               MOV     #64$,@#ERRVEC   ;;SET UP ERROR VECTOR
1412  001700  012737  177570  001140               MOV     #DSWR,SWR       ;;SETUP FOR A HARDWARE SWICH REGISTER
1413  001706  012737  177570  001142               MOV     #DDISP,DISPLAY  ;;AND A HARDWARE DISPLAY REGISTER
1414  001714  022777  177777  177216               CMP     #-1,@SWR        ;;TRY TO REFERENCE HARDWARE SWR
1415  001722  001012                               BNE     66$             ;;BRANCH IF NO TIMEOUT TRAP OCCURRED
1416                                                                        ;;AND  THE HARDWARE SWR IS NOT = -1
1417  001724  000403                               BR      65$             ;;BRANCH IF NO TIMEOUT
1418  001726  012716  001734          64$:         MOV     #65$,(SP)       ;;SET UP FOR TRAP RETURN
1419  001732  000002                               RTI
1420  001734  012737  000176  001140  65$:         MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
1421  001742  012737  000174  001142               MOV     #DISPREG,DISPLAY
1422  001750  012637  000004          66$:         MOV     (SP)+,@#ERRVEC  ;;RESTORE ERROR VECTOR
1423
```

```
                                        .SBTTL  TYPE PROGRAM NAME
                                        ;;TYPE THE NAME OF THE PROGRAM IF FIRST PASS
001754  005227  177777                          INC     #-1                     ;;FIRST TIME?
001760  001046                                  BNE     67$                     ;;BRANCH IF NO
001762  022737  020514  000042                  CMP     #$ENDAD,@#42            ;;ACT-11?
001770  001442                                  BEQ     67$                     ;;BRANCH IF YES
001772  104401  002030                          TYPE    ,68$                    ;;TYPE ASCIZ STRING
                                        .SBTTL  GET VALUE FOR SOFTWARE SWITCH REGISTER
001776  005737  000042                          TST     @#42                    ;;ARE WE RUNNING UNDER XXDP/ACT?
002002  001006                                  BNE     69$                     ;;BRANCH IF YES
002004  023727  001140  000176                  CMP     SWR,#SWREG              ;;SOFTWARE SWITCH REG SELECTED?
002012  001005                                  BNE     70$                     ;;BRANCH IF NO
002014  104406                                  GTSWR                           ;;GET SOFT-SWR SETTINGS
002016  000403                                  BR      70$
002020  112737  000001  001134          69$:    MOVB    #1,$AUTOB               ;;SET AUTO-MODE INDICATOR
002026                                  70$:
002026  000423                                  BR      67$                     ;;GET OVER THE ASCIZ
                                        ;;68$:  .ASCIZ  <CRLF>#CZKMEA0 DMS11-BA DYNAMIC DIAGNOSTIC#<CRLF>
002076                                  67$:
002076  012706  001100                  MONIT:  MOV     #STACK,SP
002102  012737  000340  177776                  MOV     #340,PSW
002110  012737  000006  000004                  MOV     #6.4                    ;SET 4 FOR TIMEOUT
002116  012737  000004  000006                  MOV     #4.6
002124  005737  002256                          TST     4$
002130  001004                                  BNE     1$
002132  004737  027452                          JSR     PC,GETCOR
002136  005137  002256                          COM     4$
002142  004737  021660          1$:             JSR     PC,@#$TKINT                     ;ENABLE TTY INTS.
002146  104401  002154                          TYPE    ,65$                    ;;TYPE ASCIZ STRING
002152  000421                                  BR      64$                     ;;GET OVER THE ASCIZ
                                        ;;65$:  .ASCIZ  <15><12>/(1)DIAG.TEST(2)CONFIGURATION  /
002216                                  64$:
002216  104412                                  RDOCT
002220  012600                                  MOV     (SP)+,R0
002222  022700  000001                          CMP     #1,R0                   ;LOGIC TEST?
002226  001451                                  BEQ     LOOP
002230  022700  000002                          CMP     #2,R0                   ;CONFIG. MODE?
002234  001003                                  BNE     3$
002236  004737  024424                          JSR     PC,MODTAB               ;MODIFY THE CONFIGURATION ROUTINE
002242  000715                                  BR      MONIT
002244                                  3$:
002244  104401  002252                          TYPE    ,67$                    ;;TYPE ASCIZ STRING
002250  000401                                  BR      66$                     ;;GET OVER THE ASCIZ
                                        ;;67$:  .ASCIZ  ??
002254                                  66$:
002254  000710                                  BR      MONIT
002256  000000          4$:             0       ;SWITCH


                                        ;KMC11 DEVICE REGISTERS AND INTERRUPT BEGINOL

002260  000001          SEL0:   1
002262  000001          SEL1:   1
002264  000001          SEL2:   1
002266  000001          SEL3:   1
002270  000001          SEL4:   1
```

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 1480  002272  000001                  SEL5:   1
 1481  002274  000001                  SEL6:   1
 1482  002276  000001                  SEL7:   1
 1483  002300  000001                  VECIN:  1
 1484  002302  000001                  VECOUT: 1
 1485  002304  000001                  PRIIN:  1
 1486  002306  000001                  PRIOUT: 1
 1487  002310     000                  FSWSW:  .BYTE
 1488  002311     000                  MODE:   .BYTE           ;200=BOP, 0=CCP
 1489  002312     000                  LINEB:  .BYTE
 1490  002313     000                  CLINE:  .BYTE
 1491
 1492                                  .EVEN
 1493  002314  000000                  CRC32F: 0               ;CRC32 ENABLED (0=NO 200=YES)
 1494  002316  000000                  CLKDAT: 0               ;MODE OF DATA LOOP (I/E) (200=INT. 0=EXT.)
 1495  002320  000000                  CHRADR: 0               ;HOLD CHARACTER OF RDCHR FOR ECHO
 1496  002322  000000                  CURLUR: 0               ;CURRENT LINE UNIT REGISTER UNDER TEST
 1497  002324     000                  CURDAT: .BYTE           ;CURRENT DATA
 1498  002325     000                  CNTBIT: .BYTE           ;UPPER BYTE TO CONTAIN CONTROL BIT
 1499  002326  000000                  CONBIT: .WORD           ;CONTROL BIT
 1500  002330  000000                  MODMSK: 0
 1501  002332  000000                  TYPFLG: 0
 1502  002334  000000                  SAVE:   .WORD
 1503
 1504
 1505
 1506  002336  000000                  HADDR:  0       ;HIGH ADDRESS
 1507  002340  000000                  XBITS:  0       ;EXTENDED ADDRESS BITS
 1508  002342  000000                  CSR0:   0
 1509  002344  000000                  CSR2:   0
 1510  002346  000000                  CSR4:   0
 1511  002350  000000                  CSR6:   0
 1512
 1513
 1514
 1515
 1516  002352  012706  001100          LOOP:   MOV     #STACK,SP
 1517  002356  004737  030270                  JSR     PC,LPARND               ;DISPLAY UNITS NEEDING LOOP CONNECTORS
 1518  002362  012737  026232  024360  RESTRT: MOV     #KMCTAB-12,CURTAB
 1519  002370  004737  026506                  JSR     PC,GETKMC       ;GET NEXT ENABLED KMC11
 1520  002374  000422                          BR      SETUP           ;BR=NO KMCS ENABLED
 1521  002376  005037  001102          LTEST:  CLR     $TSTNM
 1522  002402  005037  002460                  CLR     TSTNUM
 1523  002406  005037  002330                  CLR     MODMSK          ;SET MODE MASK
 1524  002412  105737  002311                  TSTB    MODE            ;CHECK FOR MODE
 1525  002416  100403                          BMI     11$             ;SKIP IF BOP MODE
 1526  002420  012737  170000  002330          MOV     #170000,MODMSK  ;SET CCP MODE MASK
 1527  002426  004737  021660          11$:    JSR     PC,@#$TKINT             ;ENABLE TTY INPUT
 1528  002432  005037  177776                  CLR     PSW                     ;ENABLE INTS.
 1529  002436  000137  002536                  JMP     STTEST
 1530  002442  004737  024362          SETUP:  JSR     PC,SETTAB       ;SETUP CONFIGURATION TABLE
 1531  002446  000137  002352                  JMP     LOOP
 1532          000004                  IOT=4
 1533  002452  000000                  ERNUM:  0               ;INDICATES FAILURE NUMBER
 1534  002454  000000                  CURLIN: 0               ;CURRENT LINE # UNDER TEST
 1535  002456  000000                  CUNIT:  0               ;CURRENT LINE UNIT # UNDER TEST
```

```
 1536  002460  000000                  TSTNUM: 0               ;CURRENT TEST #
 1537  002462  000000                  SHBE:   0
 1538  002464  000000                  WAS:    0
 1539  002466  000000                  XOUT:   0
 1540  002470  000000                  ROUT:   0
 1541  002472  000000                  XRET:   0       ;RETURN TRANSMIT BUFFER ADDR.
 1542  002474  000000                  RRET:   0       ;RETURN RECEIVE BUFFER ADDR.
 1543  002476  000000                  CUREA:  0
 1544  002500  000000                  CURBUF: 0
 1545  002502  000000                  MAPADR: 0
 1546  002504  000000                  RECEA:  0               ;REC. BUFFER EA
 1547  002506  000000                  RECBUF: 0               ;REC. BUFFER ADR
 1548  002510  000000                  RETEA:  0               ;ADDR BUF. SHOULD RETURN
 1549  002512  000000                  RETADR: 0               ;ADDR BUF. SHOULD RETURN
 1550  002514  000000                  RETBUF: 0
 1551  002516  000000                  CHAR:   0
 1552  002520  177770                  NXMADR: -10             ;NON-EXISTANT MEMORY ADDR
 1553
 1554  002522  000000                  BUFADR: 0               ;16 BIT ADDRESS OF BUFFER
 1555  002524  000000                  BUFEA:  0               ;EA BITS OF BUFFER (BITS 17+16 IN 15+14)
 1556  002526  000000                  BUFCNT: 0               ;CHARACTER COUNT OF BUFFER
 1557  002530  000000                  RBUFSZ: 0       ;FLAG FOR CONTROL OF REC. BUFFER
 1558
 1559  002532  100000                  BADDR:  100000          ;BASE ADDRESS OF BUFFER
 1560  002534  000000                  CCTST:  0               ;CHAR. CNT UP TO 8K BYTES OVER DIAG
 1561  002536  004737  030616          STTEST: JSR     PC,INTPRM       ;PRIME INTTERRUPT VECTORS
 1562  002542  004737  030020                  JSR     PC,LDMODE       ;LOAD FIRMWARE ACCORDING TO CONFIG.
 1563  002546  005037  177776                  CLR     PSW
 1564                                  ;;**********************************************************************
 1565                                  ;INTTST
 1566                                  ;THIS TEST WILL CHECK FOR THE PRESENCE OF THE
 1567                                  ;CURRENTLY ENABLED KMC-11 BY INITIALIZING THE
 1568                                  ;FIRMWARE AND TESTING THAT THE FIRMWARE RESPONDS
 1569                                  ;BY CLEARING BSEL2
 1570                                  ;;**********************************************************************
 1571                                  ;TEST   1
 1572                                  ;;**********************************************************************
 1573  002552  000004                  TST1:   SCOPE
 1574  002554  012737  000001  002460          MOV     #1,TSTNUM       ;LOAD THE WD OF THIS TEST
 1575  002562  004737  030244                  JSR     PC,SETLIN       ;SETUP THE FIRST LINE
 1576  002566  012737  002574  001110          MOV     #1$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
 1577  002574  012737  000001  002452  1$:     MOV     #1,ERNUM
 1578  002602  005037  002462                  CLR     SHBE
 1579  002606  013746  000004                  MOV     @#4,-(SP)
 1580  002612  012737  002712  000004          MOV     #3$,@#4         ;TEST FOR PRESENCE OF KMC-11 #=1
 1581  002620  012700  000015                  MOV     #15,R0          ;WATCH-DOG
 1582  002624  112777  000377  177432          MOVB    #377,@SEL2
 1583  002632  005077  177422                  CLR     @SEL0           ;*;CLEAR RUN, IF UP
 1584  002636  012777  040000  177414          MOV     #40000,@SEL0    ;MASTER CLR.
 1585  002644  012777  100000  177406          MOV     #100000,@SEL0   ;RUN
 1586  002652  012637  000004                  MOV     (SP)+,@#4       ;RESET LOC 4 + SP
 1587  002656  005037  001160                  CLR     $TMP0
 1588  002662  105237  001160          2$:     INCB    $TMP0           ;WAIT LOOP
 1589  002666  001375                  BNE     2$
 1590  002670  105777  177370                  TSTB    @SEL2
 1591  002674  001413                  BEQ     4$              ;FIRMWARE INITIALIZED
```

```
1592  002676  005300                          DEC     R0
1593  002700  001370                          BNE     2$                  ;TRY AGAIN
1594  002702  012737  000002  002452          MOV     #2,ERNUM            ;FIRMWARE FAILED TO INITIALIZE #=2
1595  002710  000403                          BR      31$                 ;SKIP
1596  002712                          3$:     ;CURRENT KMC-11 DEVICE ADDRESS FAILED TO RESPOND
1597  002712  022626                          POPPOP                      ;FIX THE STACK
1598  002714  012637  000004                  MOV     (SP)+,@#4
1599  002720                          31$:
1600  002720  104001                          ERROR+  1
1601  002722  000724                          BR      1$                  ;LOOP @1$
1602  002724                          4$:
1603                                  ;;******************************************************************
1604                                          ;INRDY
1605                                          ;THIS TEST CHECKS THAT THE READY IN BIT (BIT7-SEL0) IS
1606                                          ;INITIALIZED AND CONTROLLED BY THE FIRMWARE.  THE READY IN
1607                                          ;BIT IS TESTED FOR BEING INITIALLY CLEARED THEN
1608                                          ;THE REQUEST IN BIT (BIT5-SEL0) IS SET AND READY IN
1609                                          ;IS TESTED FOR BEING SET BY THE FIRMWARE, THEN REQUEST IN
1610                                          ;IS CLEARED AND READY-IN TESTED FOR BEING CLEARED BY THE FIRMWARE.
1611                                          ;
1612                                  ;;******************************************************************
1613                                          ;TEST   2
1614                                  ;;******************************************************************
1615  002724  000004                  TST2:   SCOPE
1616  002726  012737  000002  002460          MOV     #2,TSTNUM           ;LOAD THE WD OF THIS TEST
1617  002734  004737  030244                  JSR     PC,SETLIN           ;SETUP THE FIRST LINE
1618  002740  012737  002746  001110          MOV     #1$,$LPERR          ;LOAD LOOP ADDRESS (LOOP ON ERROR)
1619  002746  012737  000001  002452  1$:     MOV     #1,ERNUM
1620  002754  005037  002462                  CLR     SHBE
1621  002760  004737  030664                  JSR     PC,INTKMC           ;INITIALIZE KMC-11 FIRMWARE
1622  002764  000442                          BR      3$                  ;ERROR RET.KMC FAILED TO INITIALIZE FAIL#=1
1623  002766  005237  002452                  INC     ERNUM               ;#2
1624  002772  105777  177262                  TSTB    @SEL0               ;RDY-IN SET?
1625  002776  100424                          BMI     2$                  ;B=Y REPORT ERROR RDY-IN SET #=2
1626  003000  112777  000040  177252          MOVB    #40,@SEL0           ;SET REQUEST IN
1627  003006  005237  002452                  INC     ERNUM               ;FAIL #3=REQ IN NOT SET
1628  003012  004737  031714                  JSR     PC,SYNTIM           ;WAIT A WHILE
1629  003016  105777  177236                  TSTB    @SEL0               ;DID RDY-IN SET?
1630  003022  100025                          BPL     4$                  ;B=N REPORT ERROR RDYIN FAILED TO SET #=3
1631  003024  142777  000040  177226          BICB    #40,@SEL0           ;CLEAR REQUEST IN
1632  003032  005237  002452                  INC     ERNUM               ;READY IN FAIL TO CLEAR #=4
1633  003036  004737  031714                  JSR     PC,SYNTIM           ;WAIT A WHILE
1634  003042  105777  177212                  TSTB    @SEL0               ;DID RDY-IN CLEAR?
1635  003046  100025                          BPL     TST3                ;;RDY-IN UNDER CONTROL OF FIRMWARE
1636  003050  117737  177204  002464  2$:     MOVB    @SEL0,WAS
1637  003056  013737  002464  002462          MOV     WAS,SHBE
1638  003064  042737  000200  002462          BIC     #200,SHBE
1639  003072                          3$:
1640  003072  104002                          ERROR+  2
1641  003074  000724                          BR      1$
1642  003076  117737  177156  002464  4$:     MOVB    @SEL0,WAS
1643  003104  013737  002464  002462          MOV     WAS,SHBE
1644  003112  052737  000200  002462          BIS     #200,SHBE
1645  003120  000764                          BR      3$
1646
1647                                  ;;******************************************************************
```

```
                                        ;NOOUT
                                        ;THIS TEST CHECKS THAT THE KMC-11 FIRMWARE IS NOT
                                        ;REQUESTING AN OUTPUT OF ANY TYPE, BY EXAMINING BYTE
                                        ;2 OF THE KMC-11 CSR'S
                                ;;**************************************************************
                                        ;TEST   3
                                ;;**************************************************************
003122  000004                  TST3:   SCOPE
003124  012737  000003  002460          MOV     #3,TSTNUM       ;LOAD THE WD OF THIS TEST
003132  004737  030244                  JSR     PC,SETLIN       ;SETUP THE FIRST LINE
003136  012737  003144  001110          MOV     #1$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
003144  012737  000001  002452  1$:     MOV     #1,ERNUM
003152  005037  002462                  CLR     SHBE
003156  004737  030664                  JSR     PC,INTKMC       ;INITIALIZE KMC-11 FIRMWARE
003162  000412                          BR      3$              ;B=FIRMWARE FAILED TO INITIALIZE #=1
003164  005237  002452                  INC     ERNUM           ;FAIL #2=FIRMWARE REQ. AN OUTPUT
003170  132777  000200  177066          BITB    #200,@SEL2      ;OUTPUT REQUEST POSTED?
003176  001001                          BNE     2$              ;B=YES FIRMWARE REQUEST AN OUTPUT #=2
003200  000405                          BR      TST4            ;;OK GO ON
003202  117737  177056  002464  2$:     MOVB    @SEL2,WAS
003210                          3$:     ;FIRMWARE FAILED TO INITIALIZE
003210  104003                          ERROR+  3
003212  000754                          BR      1$

                                ;;**************************************************************
                                        ;LININT
                                        ;THIS TEST WILL DO A LINE INITIALIZE TO ALL LINES (SUCCESSFULLY)
                                        ;AND TEST THAT THE READY-IN BIT SETS AFTER EACH INITIALIZE
                                        ;COMMAND

                                ;;**************************************************************

                                        ;TEST   4
                                ;;**************************************************************
003214  000004                  TST4:   SCOPE
003216  012737  000004  002460          MOV     #4,TSTNUM       ;LOAD THE WD OF THIS TEST
003224  004737  030244                  JSR     PC,SETLIN       ;SETUP THE FIRST LINE
003230  012737  003236  001110          MOV     #1$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
003236  012737  000001  002452  1$:     MOV     #1,ERNUM        ;INIT FAIL #'S
003244  005037  002462                  CLR     SHBE
003250  004737  030664                  JSR     PC,INTKMC       ;INITIALIZE KMC-11 FIRMWARE
003254  000433                          BR      4$              ;REPORT ERROR - FIRMWARE HUNG #=1
003256                          2$:     ;TEST THAT A 'REQUEST-IN' CAN BE DONE
003256  012737  000002  002452          MOV     #2,ERNUM        ;FAIL #2=CAN NOT ISSUE AN INPUT COMMAND
003264  004737  031020                  JSR     PC,REQNI        ;CAN A INITIALIZE IN BE EXECUTED?
003270  000425                          BR      4$              ;REPORT ERROR RDY-IN FAILED OR OUTPUT REQUEST
                                        ;LOAD THE LINE-INIT COMMAND
003272  113777  002454  176766          MOVB    CURLIN,@SEL3    ;LOAD LINE #
003300  012777  000400  176766          MOV     #400,@SEL6      ;ENABLE LINE
003306  005077  176756                  CLR     @SEL4           ;NOT USED
                                        ;CLEAR THE REQUEST-IN BIT TO NOTIFY FIRMWARE THAT COMMAND IS READY
003312  042777  000040  176740          BIC     #40,@SEL0       ;CLEAR REQUEST IN
                                        ;NOW TEST THAT THE FIRMWARE CLEARS READY-IN
003320  005237  002452                  INC     ERNUM           ;FIRMWARE FAILED TO COMPLETE LINE INIT COMMAND #=3
003324  005037  001160                  CLR     $TMP0
003330  105777  176724          3$:     TSTB    @SEL0           ;RDY-IN CLEAR?
```

```
1704  003334  100005                          BPL     5$              ;B=Y
1705  003336  005237  001160                  INC     $TMP0
1706  003342  001372                          BNE     3$
1707  003344                          4$:
1708  003344  104004                          ERROR+  4
1709  003346  000733                          BR      1$              ;LOOP @ 1$
1710
1711  003350                          5$:
1712  003350  004737  031650                  JSR     PC,GETLIN       ;GET THE NEXT LINE NUMBER
1713  003354  000401                          BR      TST5            ;;DONE ALL LINES
1714  003356  000737                          BR      2$              ;TRY NEXT LINE
1715
1716
1717                                  ;;*****************************************************************
1718                                  ;IOBUFIN
1719                                  ;THIS TEST WILL ISSUE A "TRANSMIT BUFFER" IN TO EACH LINE
1720                                  ;AND TEST THAT EACH COMMAND ACCEPTS.
1721                                  ; BLANK=XMIT BUFFERS IN
1722                                  ; NON-BLANK=REC BUFFERS IN
1723                                  ;;*****************************************************************
1724
1725                                  ;TEST   5
1726                                  ;;*****************************************************************
1727  003360  000004                  TST5:   SCOPE
1728  003362  012737  000005  002460          MOV     #5,TSTNUM       ;LOAD THE WD OF THIS TEST
1729  003370  004737  030244                  JSR     PC,SETLIN       ;SETUP THE FIRST LINE
1730  003374  012737  003402  001110          MOV     #1$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
1731  003402  012737  000001  002452  1$:     MOV     #1,ERNUM
1732  003410  005037  002462                  CLR     SHBE
1733  003414  004737  030664                  JSR     PC,INTKMC       ;INITIALIZE KMC-11 FIRMWARE
1734  003420  000430                          BR      4$              ;FIRMWARE FAILED TO INITIALIZE #=1
1735
1736  003422  012737  000002  002452  2$:     MOV     #2,ERNUM
1737  003430  004737  030760                  JSR     PC,REQNT        ;CAN A TRANSMIT BUFF. IN BE EXECUTED?
1738  003434  000422                          BR      4$              ;CANNOT ISSUE A REQ.IN #=2
1739                                  ;LOAD THE BUFFER IN TO EACH LINE
1740  003436  005237  002452                  INC     ERNUM
1741  003442  012737  010002  002526          MOV     #10002,BUFCNT   ;GET LENGTH OF BUFFER
1742  003450  013777  002526  176616          MOV     BUFCNT,@SEL6    ;LOAD LENGTH
1743  003456  012777  052260  176604          MOV     #TBUF,@SEL4     ;ADDRESS OF BUFFER
1744  003464  113777  002454  176574          MOVB    CURLIN,@SEL3    ;LOAD LINE #
1745                                  ;TEST THAT FIRMWARE ACCEPTS COMMAND
1746  003472  004737  031772                  JSR     PC,INPDUN       ;TEST THAT INPUT COMPLETED
1747  003476  000401                          BR      4$              ;COMMAND FAIL TO COMPLETE #=3
1748  003500  000404                          BR      5$              ;OK GO ON
1749  003502                          4$:
1750  003502  004737  031470                  JSR     PC,GETCSR       ;GET CONTENTS OF THE CSRS
1751  003506  104005                          ERROR+  5
1752  003510  000744                          BR      2$
1753
1754  003512                          5$:
1755  003512  004737  031650                  JSR     PC,GETLIN       ;GET THE NEXT LINE NUMBER
1756  003516  000401                          BR      TST6            ;;ALL BUFFERS TESTED
1757  003520  000740                          BR      2$
1758
1759                                  ;;*****************************************************************
```

```
                                        ;IOBUFIN
                                        ;THIS TEST WILL ISSUE A 'RECEIVE BUFFER IN'' TO EACH LINE
                                        ;AND TEST THAT EACH COMMAND ACCEPTS.
                                        ;X BLANK=XMIT BUFFERS IN
                                        ;X NON-BLANK=REC BUFFERS IN
                                    ;;**********************************************************************

                                        ;TEST   6
                                    ;;**********************************************************************
003522  000004                      TST6:   SCOPE
003524  012737  000006  002460              MOV     #6,TSTNUM       ;LOAD THE WD OF THIS TEST
003532  004737  030244                      JSR     PC,SETLIN       ;SETUP THE FIRST LINE
003536  012737  003544  001110              MOV     #1$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
003544  012737  000001  002452  1$:         MOV     #1,ERNUM
003552  005037  002462                      CLR     SHBE
003556  004737  030664                      JSR     PC,INTKMC       ;INITIALIZE KMC-11 FIRMWARE
003562  000430                              BR      4$              ;FIRMWARE FAILED TO INITIALIZE #=1

003564  012737  000002  002452  2$:         MOV     #2,ERNUM
003572  004737  030770                      JSR     PC,REQNR        ;CAN A REC. BUFFER-IN BE EXECUTED?
003576  000422                              BR      4$              ;CANNOT ISSUE A REQ.IN #=2
                                        ;LOAD THE BUFFER IN TO EACH LINE
003600  005237  002452                      INC     ERNUM
003604  012737  010002  002526              MOV     #10002,BUFCNT   ;GET LENGTH OF BUFFER
003612  013777  002526  176454              MOV     BUFCNT,@SEL6    ;LOAD LENGTH
003620  012777  052660  176442              MOV     #RBUF,@SEL4             ;RECEIVE BUFFER
003626  113777  002454  176432              MOVB    CURLIN,@SEL3    ;LOAD LINE #
                                        ;TEST THAT FIRMWARE ACCEPTS COMMAND
003634  004737  031772                      JSR     PC,INPDUN       ;TEST THAT INPUT COMPLETED
003640  000401                              BR      4$              ;COMMAND FAIL TO COMPLETE #=3
003642  000404                              BR      5$              ;OK GO ON
003644                              4$:
003644  004737  031470                      JSR     PC,GETCSR       ;GET CONTENTS OF THE CSRS
003650  104006                              ERROR+  6
003652  000744                              BR      2$

003654                              5$:
003654  004737  031650                      JSR     PC,GETLIN       ;GET THE NEXT LINE NUMBER
003660  000401                              BR      TST7            ;;ALL BUFFERS TESTED
003662  000740                              BR      2$

                                    ;;**********************************************************************
                                        ;XRTST
                                        ;THIS TEST CHECKS THAT EACH LINE CAN ACCEPT AND FIELD A
                                        ;TRANSMIT AND RECEIVE BUFFER.  EACH LINE IS INITIALIZED,
                                        ;THE MAINT. LOOP AND CLOCK IS ENABLED AND TWO RECEIVE
                                        ;AND ONE TRANSFMIT BUFFER ARE THEN QUEUED TO THE LINE UNDER
                                        ;TEST.  *A SERIES OF TESTS ARE PERFORMED TO CHECK THAT:
                                        ;1) THE FIRST RECEIVE BUFFER IS RETURNED WITH AN EMA (1)
                                        ;STATUS AND THE CORRECT ENDING MEMORY ADDRESS,
                                        ;2) THE TRANSMIT BUFFER IS RETURNED WITH A 1 STATUS AND THE
                                        ;CORRECT MEMORY ADDRESS.
                                        ;THE FAIL #'S RANGE FROM 1 TO 22 (OCTAL)
                                    ;;**********************************************************************

                                        ;TEST   7
```

```
1816                                    ;;*****************************************************************
1817  003664  000004                    TST7:   SCOPE
1818  003666  012737  000007  002460            MOV     #7,TSTNUM       ;LOAD THE WD OF THIS TEST
1819  003674  004737  030244                    JSR     PC,SETLIN       ;SETUP THE FIRST LINE
1820  003700  012737  003706  001110            MOV     #1$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
1821  003706  012737  000001  002452  1$:       MOV     #1,ERNUM        ;INITIALIZE ERROR
1822  003714  013700  002454                    MOV     CURLIN,R0
1823  003720  005037  002462                    CLR     SHBE
1824  003724  004737  030664                    JSR     PC,INTKMC       ;INITIALIZE KMC-11 FIRMWARE
1825  003730  000413                            BR      15$             ;FIRMWARE FAILED TO INITIALIZE #=1
1826  003732  005237  002452                    INC     ERNUM
1827  003736  004737  031204                    JSR     PC,INTLNE       ;INITIALIZE LINE (# IN CURLIN)
1828  003742  000406                            BR      15$             ;CURRENT LINE FAILED TO INITIALIZE #=2
1829  003744  005237  002452                    INC     ERNUM
1830  003750  004737  031274                    JSR     PC,STCLK        ;SET MAINT LOOP + START CLOCK
1831  003754  000401                            BR      15$             ;B=CLOCK NOT STARTED #=3
1832  003756  000402                            BR      16$             ;OK
1833  003760  000137  004510          15$:      JMP     6$              ;GO TO ERR
1834                                    ;LOAD RECEIVE BUFFER IN COMMANDS
1835  003764  012737  052660  002522  16$:      MOV     #RBUF,BUFADR    ;LOAD THE BUFFER ADDRESS
1836  003772  005037  002524                    CLR     BUFEA           ;NO EA BITS
1837  003776  012737  000002  002526            MOV     #2,BUFCNT       ;SET 1ST BUFFER SHORT
1838  004004  005237  002452                    INC     ERNUM
1839  004010  004737  031344                    JSR     PC,RIN          ;LOAD A RECEIVE BUFFER IN
1840  004014  000761                            BR      15$             ;1ST RECEIVE BUFFER FAILED TO LOAD #=4
1841  004016  005237  002452                    INC     ERNUM
1842  004022  012737  000020  002526            MOV     #20,BUFCNT      ;SET 2ND BUFFER LONG
1843  004030  004737  031344                    JSR     PC,RIN          ;LOAD A RECEIVE BUFFER IN
1844  004034  000751                            BR      15$             ;2ND RECEIVE BUFFER FAILED TO LOAD #=5
1845                                    ;LOAD TRANSMIT BUFFER IN COMMAND
1846  004036  012737  033022  002522            MOV     #T7BUF,BUFADR   ;LOAD THE TRANSMIT BUFFER ADDRESS
1847  004044  012737  000004  002526            MOV     #4,BUFCNT       ;SET TX BUFFER LENGTH TO MEDIUM
1848  004052  005237  002452                    INC     ERNUM
1849  004056  004737  031354                    JSR     PC,XIN          ;LOAD A TRANSMIT BUFFER IN
1850  004062  000736                            BR      15$             ;TRANSMIT BUFF FAIL TO LOAD #=6
1851  004064  005237  002452                    INC     ERNUM
1852  004070  012737  000204  002462            MOV     #204,SHBE       ;GET RECEIVE BUFFER OUT COMMAND
1853  004076  005037  001160                    CLR     $TMP0           ;SET UP WAIT LOOP
1854  004102  105777  176156          2$:       TSTB    @SEL2           ;OUTPUT REQUESTED?
1855  004106  100405                            BMI     3$              ;B=Y OK
1856  004110  005237  001160                    INC     $TMP0
1857  004114  001372                            BNE     2$              ;GO WAIT SOME MORE
1858  004116  000137  004510                    JMP     6$              ;REQ.OUT FAILED TO SET REPORT ERROR #=7
1859  004122  005237  002452          3$:       INC     ERNUM
1860                                    ;TEST THAT COMMAND IS RECEIVE BUFFER OUT
1861  004126  123777  002462  176130            CMPB    SHBE,@SEL2      ;CHEC.. SEL2
1862  004134  001165                            BNE     6$              ;B=NO REPORT 1ST COMMAND BUFFER TYPE INCORRECT #=10
1863  004136  005237  002452                    INC     ERNUM
1864                                    ;TEST THAT CORRECT STATUS IS RETURNED
1865  004142  012737  000001  002462            MOV     #1,SHBE         ;SET STATUS TO END COUNT REACHED
1866  004150  123777  002462  176116            CMPB    SHBE,@SEL6      ;CORRECT STATUS?
1867  004156  001154                            BNE     6$              ;B=NO 1ST STATUS INCORRECT #=11
1868  004160  005237  002452                    INC     ERNUM
1869                                    ;TEST THAT RETURNED LINE # IS THE CURRENT LINE
1870  004164  013737  002454  002462            MOV     CURLIN,SHBE
1871  004172  127737  176070  002454            CMPB    @SEL3,CURLIN    ;SAME LINE #?
```

```
1872  004200  001143                        BNE     6$              ;B=NO 1ST LINE NUMBER INCORRECT #=12
1873  004202  005237  002452                INC     ERNUM
1874                                        ;TEST THAT ENDING MEMORY ADDRESS OF RETURNED BUFFER IS CORRECT
1875  004206  017737  176062  002462        MOV     @SEL6,SHBE      ;GET EXTENDED ADDRESS
1876  004214  042737  140000  002462        BIC     #140000,SHBE    ;EXTENDED BITS SHOULD BE CLEAR
1877  004222  132777  000300  176046        BITB    #300,@SEL7      ;SHOULD BE EA- BITS
1878  004230  001127                        BNE     6$              ;REPORT EXTENDED ADDRESS NOT CORRECT #=13
1879  004232  005237  002452                INC     ERNUM
1880  004236  105737  002311                TSTB    MODE            ;TEST MODE FOR PROPER 16-BIT ADDRESS
1881  004242  100404                        BMI     30$
1882  004244  012737  052662  002462        MOV     #RBUF+2,SHBE    ;CCP MODE
1883  004252  000403                        BR      31$
1884  004254  012737  052664  002462  30$:  MOV     #RBUF+4,SHBE    ;BOP MODE
1885  004262  023777  002462  176000  31$:  CMP     SHBE,@SEL4      ;CORRECT 16 BIT ADDRESS?
1886  004270  001107                        BNE     6$              ;B=N REPORT 1ST 16-BIT ADDRESS NOT CORRECT #=14
1887  004272  005237  002452                INC     ERNUM
1888                                        ;NOW CLEAR READY OUT AND TEST THAT ANOTHER BUFFER OUT COMMAND
1889                                        ;IS PRESENT WITHIN PRESCRIBED TIME PERIOD.
1890  004276  105077  175762                CLRB    @SEL2           ;CLEAR READY OUT
1891  004302  012737  000200  002462        MOV     #200,SHBE       ;GET TRANSMIT BUFFER OUT COMMAND
1892  004310                          33$:
1893  004310  004737  031742                JSR     PC,REQOUT       ;TEST REQUEST OUT OF KMC SETS
1894  004314  000475                        BR      6$              ;REPORT ERROR 2ND BUFFER NOT RETURNED #=15
1895  004316  005237  002452          5$:   INC     ERNUM
1896                                        ;TEST THAT COMMAND IS TRANSMIT BUFFER OUT
1897  004322  122777  000204  175734        CMPB    #204,@SEL2      ;CHECK IF COMMAND IS 2ND RETURNING RX BUFFER
1898  004330  001005                        BNE     4$              ;B=NO
1899  004332  105077  175726                CLRB    @SEL2           ;DISMISS 2ND RECEIVE BUFFER
1900  004336  005337  002452                DEC     ERNUM           ;RESET ERROR #
1901  004342  000762                        BR      33$             ; & GO WAIT SOME MORE
1902  004344  123777  002462  175712  4$:   CMPB    SHBE,@SEL2      ;IS COMMAND CORRECT?
1903  004352  001056                        BNE     6$              ;B=NO REPORT COMMAND NOT CORRECT #=16
1904  004354  005237  002452                INC     ERNUM
1905                                        ;TEST THAT RETURNED STATUS IS AN ENDING MEMORY ADDRESS
1906  004360  012737  000001  002462        MOV     #1,SHBE         ;GET CORRECT TERMINATION STATUS
1907  004366  123777  002462  175700  34$:  CMPB    SHBE,@SEL6      ;CORRECT STATUS?
1908  004374  001045                        BNE     6$              ;B=N ERROR #=17
1909  004376  005237  002452                INC     ERNUM
1910                                        ;TEST THAT RETURNED LINE # IS THE CURRENT LINE
1911  004402  013737  002454  002462        MOV     CURLIN,SHBE
1912  004410  127737  175652  002454        CMPB    @SEL3,CURLIN    ;CORRECT LINE #?
1913  004416  001034                        BNE     6$              ;B=NO ERROR #=20
1914  004420  005237  002452                INC     ERNUM
1915                                        ;TEST THAT ENDING MEMORY ADDRESS OF RETURNED BUFFER IS CORRECT
1916  004424  017737  175644   02462        MOV     @SEL6,SHBE      ;GET EXTENDED ADDRESS
1917  004432  042737  14000C  002462        BIC     #140000,SHBE    ;EXTENDED BITS SHOULD BE CLEAR
1918  004440  132777  000300  175630        BITB    #300,@SEL7      ;EA BITS?
1919  004446  001020                        BNE     6$              ;B=YES ERROR #=21
1920  004450  005237  002452                INC     ERNUM
1921  004454  105737  002311                TSTB    MODE
1922  004460  100404                        BMI     35$
1923  004462  012737  033026  002462        MOV     #T7BUF+4,SHBE   ;CCP MODE TX ENDING BUFFER ADDRESS
1924  004470  000403                        BR      36$
1925  004472  012737  033032  002462  35$:  MOV     #T7BUF+10,SHBE  ;BOP MODE TX ENDING BUFFER ADDRESS
1926  004500  023777  002462  175562  36$:  CMP     SHBE,@SEL4      ;CORRECT 16 BIT ADDRESS?
1927  004506  001405                        BEQ     7$              ;B=YES
```

```
                                                ;INCORRECT 16-BIT ADDRESS #=22
004510                          6$:     ;REPORT ERROR BY DISPLAYING CONTENTS OF THE CSRS
004510  004737  031470                  JSR     PC,GETCSR       ;GET CONTENTS OF THE CSRS
004514  104007                          ERROR+  7
004516  000137  003706                  JMP     1$              ;LOOP @ 1$

                                        ;TEST ALL LINES
004522                          7$:
004522  004737  031650                  JSR     PC,GETLIN       ;GET THE NEXT LINE NUMBER
004526  000402                          BR      TST10           ;;ALL LINES TESTED
004530  000137  003706          8$:     JMP     1$

                                ;;**************************************************************
                                        ;LINOVR
                                        ;THIS TEST CHECKS THAT A LINE OVERFLOW CONDITION WILL RETURN A
                                        ;"CONTROL OUT" STATUS INDICATING THE LINE OVERFLOW.
                                        ;EACH LINE IS TESTED FOR RETURNING THE OVERFLOW STATUS BY INITIALIZING
                                        ;THE LINE, QUEUEING A 10 WORD TRANSMIT BUFFER AND A 1 WORD REC. BUFF.
                                        ;AND TESTING THAT A CONTROL OUT COMMAND INDICATING A LINE
                                        ;OVERFLOW FOR THE CURRENT LINE IS RETURNED AFTER THE REC. BUFFER IS RETURNED
                                ;;**************************************************************

                                        ;TEST   10
                                ;;**************************************************************
004534  000004                  TST10:  SCOPE
004536  012737  000010  002460          MOV     #10,TSTNUM      ;LOAD THE WD OF THIS TEST
004544  004737  030244                  JSR     PC,SETLIN       ;SETUP THE FIRST LINE
004550  012737  004556  001110          MOV     #1$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
004556  012737  000001  002452  1$:     MOV     #1,ERNUM
004564  005037  002462                  CLR     SHBE
004570  004737  030664                  JSR     PC,INTKMC       ;INITIALIZE KMC-11 FIRMWARE
004574  000532                          BR      3$              ;FIRMWARE FAILED TO INITIALIZE #=1
004576  004737  031204                  JSR     PC,INTLNE       ;INITIALIZE LINE (# IN CURLIN)
004602  000527                          BR      3$              ;LINE FAILED TO INITIALIZE #=1
004604  004737  031274                  JSR     PC,STCLK        ;SET MAINT LOOP + START CLOCK
004610  000524                          BR      3$              ;MAINT.COMMAND NOT ISSUED #=1
004612  004737  031714                  JSR     PC,SYNTIM       ;ALLOW TIME FOR SYNC
004616  012702  052260                  MOV     #TBUF,R2        ;INITIALIZE TRANSMIT BUFFER BEFORE 1ST USE
004622  012701  000005                  MOV     #5,R1           ; (LENGTH FOR CCP)
004626  004737  032542                  JSR     PC,MEMFIL
004632  005037  002524                  CLR     BUFEA           ;NO EA BITS
004636  012737  052660  002522          MOV     #RBUF,BUFADR
004644  012737  000001  002526          MOV     #1,BUFCNT       ;1 CHR. REC. BUFF.
004652  005237  002452                  INC     ERNUM
004656  004737  031344                  JSR     PC,RIN          ;LOAD A RECEIVE BUFFER IN
004662  000477                          BR      3$              ;REC BUF FAILED TO LOAD #=2
004664  012737  052260  002522          MOV     #TBUF,BUFADR
004672  012737  000005  002526          MOV     #5,BUFCNT       ;SET LENGTH OF TRANSMIT BUFFER
004700  005237  002452                  INC     ERNUM
004704  004737  031354                  JSR     PC,XIN          ;LOAD A TRANSMIT BUFFER IN
004710  000464                          BR      3$              ;TRANSMIT BUFFER FAILED TO LOAD #=3
004712  012737  000204  002462          MOV     #204,SHBE
                                ;WAIT FOR THE RECEIVE BUFFER (1 WORD) TO RETURN
004720  005237  002452                  INC     ERNUM
004724  004737  031742                  JSR     PC,REQOUT       ;TEST REQUEST OUT OF KMC SETS
004730  000454                          BR      3$              ;RECEIVE BUFFER NOT RETURNED #=4
```

```
 1984  004732  105077  175326                    CLRB    @SEL2           ;;DISMISS THE FIRST RETURN (REC.)
 1985                                            ;NOW WAIT FOR A CONTROL OUT TO BE RETURNED INDICATING LINE OVERFLOW
 1986  004736  005237  002452                    INC     ERNUM
 1987  004742  012737  000205  002462            MOV     #205,SHBE       ;SET EXPECTED COMMAND TO CONTROL OUT
 1988  004750  004737  031742                    JSR     PC,REQOUT       ;TEST REQUEST OUT OF KMC SETS
 1989  004754  000442                            BR      3$              ;CONTROL OUT FAILED TO RETURN #=5
 1990  004756  005237  002452                    INC     ERNUM
 1991  004762  123777  002462  175274            CMPB    SHBE,@SEL2      ;CONTROL OUT COMMAND?
 1992  004770  001034                            BNE     3$              ;RETURNED COMMAND IS NOT A CONTROL OUT #=6
 1993  004772  005237  002452                    INC     ERNUM
 1994                                            ;TEST THAT CORRECT OVERRUN STATUS FOR CURRENT MODE IS
 1995                                            ;CORRECT. CCP MODE =BIT5 SEL7 - BOP MODE =BIT2 SEL7
 1996  004776  012737  000004  002462            MOV     #4,SHBE         ;SEL7 OVERRUN STATUS BIT FOR BOP MODE
 1997  005004  105737  002311                    TSTB    MODE            ;BOP OR CCP?
 1998  005010  100403                            BMI     2$              ;B=BOP
 1999  005012  012737  000040  002462            MOV     #40,SHBE        ;CCP MODE OVERRUN STATUS BIT
 2000  005020  123777  002462  175250  2$:       CMPB    SHBE,@SEL7      ;LINE OVERRUN SET
 2001  005026  001015                            BNE     3$              ;LINE OVERRUN STATUS BIT NOT SET #=7
 2002  005030  005237  002452                    INC     ERNUM
 2003                                            ;IS LINE # (SEL3) SAME AS LINE UNDER TEST?
 2004  005034  013737  002454  002462            MOV     CURLIN,SHBE
 2005  005042  127737  175220  002454            CMPB    @SEL3,CURLIN
 2006  005050  001004                            BNE     3$              ;B=NO ERROR #=10
 2007                                            ;
 2008  005052  004737  031650                    JSR     PC,GETLIN       ;GET THE NEXT LINE NUMBER
 2009  005056  000405                            BR      TST11           ;;ALL LINES TESTED
 2010  005060  000636                            BR      1$
 2011
 2012                                            ;REPORT ERROR
 2013  005062                            3$:
 2014  005062  004737  031470                    JSR     PC,GETCSR       ;GET CONTENTS OF THE CSRS
 2015  005066  104010                            ERROR+  10
 2016  005070  000632                            BR      1$
 2017
 2018
 2019                                    ;;**************************************************************************
 2020                                            ;RSTRCV
 2021                                            ;THIS TEST CHECKS THAT THE RECEIVE BUFFERS ARE KILLED BY THE "LINE RESET"
 2022                                            ;COMMAND BY INITIALIZING THE CURRENT LINE, QUEUEING A SHORT RECEIVE BUFFER
 2023                                            ;TO THE LINE, ISSUEING A "LINE RESET" COMMAND, STARTING THE
 2024                                            ;MAINTENANCE CLOCK, QUEUING A SECOND RECEIVE BUFFER TO THE LINE,
 2025                                            ;SENDING A LONGER TRANSMIT BUFFER TO THE LINE,
 2026                                            ;AND TESTING THAT A CONTROL OUT COMMAND IS RETURNED (LINE OVERFLOW
 2027                                            ;OF THE CURRENT LINE) AFTER ONE RECEIVE BUFFER OUT IS RETURNED.
 2028                                    ;;**************************************************************************
 2029
 2030                                            ;TEST   11
 2031                                    ;;**************************************************************************
 2032  005072  000004                    TST11:  SCOPE
 2033  005074  012737  000011  002460            MOV     #11,TSTNUM      ;LOAD THE WD OF THIS TEST
 2034  005102  004737  030244                    JSR     PC,SETLIN       ;SETUP THE FIRST LINE
 2035  005106  012737  005114  001110            MOV     #1$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
 2036  005114  012737  000001  002452  1$:       MOV     #1,ERNUM
 2037  005122  005037  002462                    CLR     SHBE
 2038  005126  004737  030664                    JSR     PC,INITKMC      ;INITIALIZE KMC-11 FIRMWARE
 2039  005132  000574                            BR      7$              ;FIRMWARE FAILED TO INITIALIZE #=1
```

```
2040  005134  004737  031204              JSR     PC,INTLNE       ;INITIALIZE LINE (# IN CURLIN)
2041  005140  000571                      BR      7$              ;INITIALIZATION OF LINES FAILED #=1
2042  005142  004737  031274              JSR     PC,STCLK        ;SET MAINT LOOP + START CLOCK
2043  005146  000566                      BR      7$              ;CLOCK FAILED TO START
2044                                      ;QUEUE A RECEIVE BUFFER TO THE CURRENT LINE UNDER TEST
2045  005150  012737  052660  002522      MOV     #RBUF,BUFADR
2046  005156  005037  002524              CLR     BUFEA
2047  005162  012737  010002  002526      MOV     #10002,BUFCNT   ;3 CHARACTER RECEIVE BUFFER
2048  005170  043737  002330  002526      BIC     MODMSK,BUFCNT
2049  005176  005237  002452              INC     ERNUM
2050  005202  004737  031344              JSR     PC,RIN          ;LOAD A RECEIVE BUFFER IN
2051  005206  000546                      BR      7$              ;RECEIVE BUFFER FAILED TO LOAD #=2
2052                                      ;ISSUE THE "LINE RESET" COMMAND TO THE CURRENT LINE
2053  005210  005237  002452              INC     ERNUM
2054  005214  004737  031000              JSR     PC,REQNC        ;CAN A CONTROL IN BE EXECUTED?
2055  005220  000541                      BR      7$              ;CANNOT ISSUE COMMAND ERROR #=3
2056  005222  005237  002452              INC     ERNUM
2057  005226  113777  002454  175032      MOVB    CURLIN,@SEL3    ;LOAD THE LINE #
2058  005234  012777  010000  175032      MOV     #10000,@SEL6    ;LINE RESET INDICATOR
2059  005242  005077  175022              CLR     @SEL4           ;UNUSED
2060  005246  004737  031772              JSR     PC,INPDUN       ;TEST THAT INPUT COMPLETED
2061  005252  000524                      BR      7$              ;LINE RESET COMMAND FAILED TO COMPLETE #=4
2062  005254  005237  002452              INC     ERNUM
2063  005260  004737  031274              JSR     PC,STCLK        ;SET MAINT LOOP + START CLOCK
2064  005264  000517                      BR      7$
2065  005266  004737  031714              JSR     PC,SYNTIM               ;ALLOW FOR SYNC
2066  005272  005237  002452              INC     ERNUM
2067  005276  012737  052664  002522      MOV     #RBUF+4,BUFADR  ;;LOAD NEW RECV
2068  005304  004737  031344              JSR     PC,RIN          ;LOAD A RECEIVE BUFFER IN
2069  005310  000505                      BR      7$              ;;RECV BUF FAILED TO LOAD: #=6
2070  005312  005237  002452              INC     ERNUM
2071  005316  012737  010006  002526      MOV     #10006,BUFCNT
2072  005324  043737  002330  002526      BIC     MODMSK,BUFCNT
2073  005332  012737  052260  002522      MOV     #TBUF,BUFADR
2074  005340  004737  031354              JSR     PC,XIN          ;LOAD A TRANSMIT BUFFER IN
2075  005344  000467                      BR      7$              ;TRANSMIT BUFFER IN FAILED TO LOAD #=7
2076  005346  005237  002452              INC     ERNUM
2077  005352  012737  000204  002462      MOV     #204,SHBE       ;EXPECT RECEIVE BUFFER OUT
2078  005360  004737  031742              JSR     PC,REQOUT       ;WAIT FOR BUFFER
2079  005364  000457                      BR      7$              ;BUFFER NOT RETURNED: #=10
2080  005366  105077  174672              CLRB    @SEL2           ;DISMISS
2081  005372  005237  002452              INC     ERNUM
2082                                      ;TEST THAT RECEIVE BUFFER WAS RESET (KILLED) BY TESTING THAT A LINE
2083                                      ;OVERFLOW "CONTROL OUT" STATUS IS NOW RECEIVED
2084  005376  012737  000205  002462      MOV     #205,SHBE       ;EXPECT CONTROL OUT COMMAND
2085  005404  005037  002464              CLR     WAS
2086  005410  005037  001160              CLR     $TMP0
2087
2088  005414  105777  174644      4$:     TSTB    @SEL2
2089  005420  100404                      BMI     5$              ;B=OUT RDY SET
2090  005422  005237  001160              INC     $TMP0
2091  005426  001372                      BNE     4$              ;TRY AGAIN
2092  005430  000435                      BR      7$              ;FIRMWARE DID NOT RETURN AN OUTPUT #=11
2093  005432  005237  002452      5$:     INC     ERNUM
2094                                      ;BOP-IF A CONTROL OUT SEL7 BIT2 SHOULD BE SET
2095                                      ;CCP-IF A CONTROL OUT SEL7 BIT5 SHOULD BE SET
```

```
2096  005436  012737  002000  002462          MOV     #2000,SHBE      ;SET FOR BOP
2097  005444  105737  002311                  TSTB    MODE            ;BOP?
2098  005450  100403                          BMI     56$             ;B=YES
2099  005452  012737  020000  002462          MOV     #20000,SHBE     ;NO, SET TO CCP
2100  005460  033777  002462  174606  56$:    BIT     SHBE,@SEL6      ;IS BIT SET?
2101  005466  001416                          BEQ     7$              ;B=NO, ERROR #=12
2102  005470  005237  002452                  INC     ERNUM
2103                                          ;WAS CORRECT LINE NUMBER RETURNED
2104  005474  013737  002454  002462          MOV     CURLIN,SHBE
2105  005502  123777  002454  174556          CMPB    CURLIN,@SEL3    ;CORRECT LINE # RETURNED
2106  005510  001005                          BNE     7$              ;B=NO ERROR #=13
2107  005512  004737  031650                  JSR     PC,GETLIN       ;GET THE NEXT LINE NUMBER
2108  005516                          57$:
2109  005516  000407                          BR      TST12           ;;ALL LINES TESTED
2110  005520  000137  005114          6$:     JMP     1$              ;DO NEXT LINE
2111
2112                                          ;REPORT ERROR BY DISPLAYING THE ERROR # AND CONTENTS OF CSRS
2113  005524                          7$:
2114  005524  004737  031470                  JSR     PC,GETCSR       ;GET CONTENTS OF THE CSRS
2115  005530  104011                          ERROR+  11
2116  005532  000137  005114                  JMP     1$
2117
2118                                  ;;**************************************************************************
2119                                          ;RSTXMT
2120                                          ;THIS TEST WILL CHECK THAT THE TRANSMIT BUFFERS ARE KILLED BY A
2121                                          ;LINE RESET BY INITIALIZING THE CURRENT LINE, QUEUEING A TRANSMIT BUFFER TO THE
2122                                          ;LINE, ISSUEING A LINE RESET COMMAND, STARTING THE CLOCK AND TESTING THAT NO
2123                                          ;OUTPUT IS RETURNED FROM THE KMC.
2124                                  ;;**************************************************************************
2125
2126                                          ;TEST   12
2127                                  ;;**************************************************************************
2128  005536  000004                  TST12:  SCOPE
2129  005540  012737  000012  002460          MOV     #12,TSTNUM      ;LOAD THE WD OF THIS TEST
2130  005546  004737  030244                  JSR     PC,SETLIN       ;SETUP THE FIRST LINE
2131  005552  012737  005560  001110          MOV     #1$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
2132  005560  005037  002462          1$:     CLR     SHBE
2133  005564  012737  000001  002452          MOV     #1,ERNUM
2134  005572  004737  030664                  JSR     PC,INTKMC       ;INITIALIZE KMC-11 FIRMWARE
2135  005576  000452                          BR      4$              ;FIRMWARE FAILED TO INITIALIZE #=1
2136  005600  004737  031204                  JSR     PC,INTLNE       ;INITIALIZE LINE (# IN CURLIN)
2137  005604  000447                          BR      4$              ;LINE INITIALIZE FAILED TO COMPLETE #=1
2138  005606  012737  052260  002522          MOV     #TBUF,BUFADR    ;TRANSMIT BUFFER ADDRESS
2139  005614  005037  002524                  CLR     BUFEA           ;NO EA-BITS
2140  005620  012737  000777  002526          MOV     #777,BUFCNT     ;BIG CHARACTER BUFFER
2141  005626  043737  002330  002526          BIC     MODMSK,BUFCNT
2142  005634  005237  002452                  INC     ERNUM
2143  005640  004737  031354                  JSR     PC,XIN          ;LOAD A TRANSMIT BUFFER IN
2144  005644  000427                          BR      4$              ;BUFFER IN FAILED TO COMPLETE #=2
2145                                          ;ISSUE A LINE RESET COMMAND
2146  005646  005237  002452                  INC     ERNUM
2147  005652  004737  031546                  JSR     PC,LRSET        ;ISSUE A LINE RESET TO THE CURRENT LINE
2148  005656  000422                          BR      4$              ;LINE RESET COMMAND FAILED #=3
2149  005660  005237  002452                  INC     ERNUM
2150  005664  004737  031274                  JSR     PC,STCLK        ;SET MAINT LOOP + START CLOCK
2151  005670  000415                          BR      4$              ;STCLK COMMAND FAILED #=4
```

```
                                        ;ISR     PC,SYNTIM       ;WAIT A WHILE
                                        ;NOW TEST THAT NO OUTPUT IS RETURNED FROM THE KMC
                                        INC     ERNUM
                                        JSR     PC,REQOUT       ;TEST REQUEST OUT OF KMC SETS
                                        BR      10$             ;B=NO OK
                                        BR      4$              ;ERROR OUTPUT REQUESTED #=5
                                10$:    ;ARE THERE MORE LINES
                                        JSR     PC,GETLIN       ;GET THE NEXT LINE NUMBER
                                        BR      TST13           ;;
                                        JMP     1$
                                        ;REPORT ERROR - DISPLAY THE CSR'S
                                4$:
                                        JSR     PC,GETCSR       ;GET CONTENTS OF THE CSRS
                                        ERROR+  12
                                        BR      1$

                                ;;**************************************************************
                                        ;NABORT
                                        ;THIS TEST WILL CHECK THAT THE "IN ABORT" COMMAND DOES NOT
                                        ;TERMINATE ANY OF THE TRANSMIT BUFFERS BY INITIALIZING EACH
                                        ;LINE, SENDING A TRANSMIT BUFFER TO THE LINE THEN ISSUEING
                                        ;A LINE ABORT "IN" (BIT1 SEL7=1) TO THE LINE, AND TESTING
                                        ;THAT THE NORMAL TRANSMIT BUFFER OUT IS RETURNED.
                                ;;**************************************************************

                                        ;TEST   13
                                ;;**************************************************************
                                TST13:  SCOPE
                                        MOV     #13,TSTNUM      ;LOAD THE WD OF THIS TEST
                                        JSR     PC,SETLIN       ;SETUP THE FIRST LINE
                                        MOV     #1$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
                                1$:     CLR     SHBE
                                        MOV     #1,ERNUM
                                        JSR     PC,INTKMC       ;INITIALIZE KMC-11 FIRMWARE
                                        BR      6$              ;FIRMWARE FAILED TO INITIALIZE #=1
                                        JSR     PC,INTLNE       ;INITIALIZE LINE (# IN CURLIN)
                                        BR      6$              ;CURRENT LINE FAILED TO INITIALIZE #=1
                                        JSR     PC,STCLK        ;SET MAINT LOOP + START CLOCK
                                        BR      6$              ;CLOCK COMMAND FAILED
                                        MOV     #TBUF,BUFADR
                                        CLR     BUFEA           ;NO EA-BITS
                                        MOV     #777,BUFCNT     ;LARGE BUFFER
                                        BIC     MODMSK,BUFCNT
                                        INC     ERNUM
                                        JSR     PC,XIN          ;LOAD A TRANSMIT BUFFER IN
                                        BR      6$              ;BUFFER IN FAILED TO COMPLETE #=2
                                        ;NOW ISSUE THE ABORT COMMAND
                                        INC     ERNUM
                                        JSR     PC,REQNC        ;CAN A CONTROL IN BE EXECUTED?
                                        BR      6$              ;REPORT ERROR, HUNG OR OUTPUT REQUESTED #=3
                                        MOVB    CURLIN,@SEL3    ;LOAD LINE #
                                        MOVB    #2,@SEL7        ;ABORT LINE
                                        CLR     @SEL4           ;UNUSED
                                        CLRB    @SEL6           ;UNUSED
                                        ;WAIT FOR COMMAND TO COMPLETE
                                        INC     ERNUM
```

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2208  006114  004737  031772          JSR     PC,INPDUN       ;TEST THAT INPUT COMPLETED
2209  006120  000435                  BR      6$              ;ERROR  ABORT COMMAND FAILED TO COMPLETE #=4
2210                                  ;NOW WAIT FOR ANY BUFFERS TO BE RETURNED
2211  006122  005237  002452          INC     ERNUM
2212  006126  012737  000200  002462  MOV     #200,SHBE       ;ON TRANSMIT, EXPECT TX BUFFER OUT
2213  006134  012737  000002  006224  MOV     #2,7$           ;SET UP WAIT LOOP
2214  006142                  2$:
2215  006142  004737  031742          JSR     PC,REQOUT       ;TEST REQUEST OUT OF KMC SETS
2216  006146  000401                  BR      3$
2217  006150  000404                  BR      4$
2218  006152  005337  006224  3$:     DEC     7$
2219  006156  001371                  BNE     2$
2220  006160  000415                  BR      6$              ;ON TRANSMIT, NO OUTPUT IS ERROR #=5
2221  006162                  4$:
2222                                  ;TEST FOR CORRECT TRANSMIT TERMINATION (EMA)
2223  006162  005237  002452          INC     ERNUM
2224  006166  112737  000001  002462  MOVB    #1,SHBE
2225  006174  123777  002462  174072  CMPB    SHBE,@SEL6
2226  006202  001004                  BNE     6$              ;#6, WRONG TRANSMIT STATUS ON ABORT
2227                                  ;TEST IF ALL LINES ARE DONE
2228  006204                  5$:
2229  006204  004737  031650          JSR     PC,GETLIN       ;GET THE NEXT LINE NUMBER
2230  006210  000406                  BR      TST14           ;;ALL LINES TESTED
2231  006212  000661                  BR      1$
2232
2233  006214                  6$:     ;REPORT ERROR
2234  006214  004737  031470          JSR     PC,GETCSR       ;GET CONTENTS OF THE CSRS
2235  006220  104013                  ERROR+  13
2236  006222  000655                  BR      1$
2237  006224  000000          7$:     0               ;DELAY COUNT
2238
2239                                  ;NABORT
2240                                  ;THIS TEST WILL CHECK THAT THE "OUT ABORT" COMMAND DOES NOT
2241                                  ;TERMINATE ANY OF THE RECEIVE BUFFERS BY INITIALIZING EACH
2242                                  ;LINE, SENDING A RECEIVE BUFFER TO THE LINE, THEN ISSUEING
2243                                  ;A LINE ABORT "OUT" (BIT1 SEL7=1) TO THE  LINE, AND TESTING
2244                                  ;THAT NO STATUS (BUFFER OUT) IS RETURNED.
2245                          ;;*****************************************************************
2246
2247                                  ;TEST   14
2248                          ;;*****************************************************************
2249  006226  000004          TST14:  SCOPE
2250  006230  012737  000014  002460  MOV     #14,TSTNUM      ;LOAD THE WD OF THIS TEST
2251  006236  004737  030244          JSR     PC,SETLIN       ;SETUP THE FIRST LINE
2252  006242  012737  006250  001110  MOV     #1$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
2253  006250  005037  002462  1$:     CLR     SHBE
2254  006254  012737  000001  002452  MOV     #1,ERNUM
2255  006262  004737  030664          JSR     PC,INTKMC       ;INITIALIZE KMC-11 FIRMWARE
2256  006266  000474                  BR      6$              ;FIRMWARE FAILED TO INITIALIZE #=1
2257  006270  004737  031204          JSR     PC,INTLNE       ;INITIALIZE LINE (# IN CURLIN)
2258  006274  000471                  BR      6$              ;CURRENT LINE FAILED TO INITIALIZE #=1
2259  006276  004737  031274          JSR     PC,STCLK        ;SET MAINT LOOP + START CLOCK
2260  006302  000466                  BR      6$              ;CLOCK COMMAND FAILED
2261  006304  012737  052660  002522  MOV     #RBUF,BUFADR
2262  006312  005037  002524          CLR     BUFEA           ;NO EA-BITS
2263  006316  012737  000777  002526  MOV     #777,BUFCNT     ;LARGE BUFFER
```

```
2264  006324  043737  002330  002526          BIC     MODMSK,BUFCNT
2265  006332  005237  002452                  INC     ERNUM
2266  006336  004737  031344                  JSR     PC,RIN          ;LOAD A RECEIVE BUFFER IN
2267  006342  000446                          BR      6$              ;BUFFER IN FAILED TO COMPLETE #=2
2268                                          ;NOW ISSUE THE ABORT COMMAND
2269  006344  005237  002452                  INC     ERNUM
2270  006350  004737  031010                  JSR     PC,REQNX        ;CAN A CONTROL OUT BE EXECUTED?
2271  006354  000441                          BR      6$              ;REPORT ERROR, HUNG OR OUTPUT REQUESTED #=3
2272  006356  113777  002454  173702          MOVB    CURLIN,@SEL3    ;LOAD LINE #
2273  006364  112777  000002  173704          MOVB    #2,@SEL7        ;ABORT LINE
2274  006372  005077  173672                  CLR     @SEL4           ;UNUSED
2275  006376  105077  173672                  CLRB    @SEL6           ;UNUSED
2276                                          ;WAIT FOR COMMAND TO COMPLETE
2277  006402  005237  002452                  INC     ERNUM
2278  006406  004737  031772                  JSR     PC,INPDUN       ;TEST THAT INPUT COMPLETED
2279  006412  000422                          BR      6$              ;ERROR  ABORT COMMAND FAILED TO COMPLETE #=4
2280                                          ;NOW WAIT FOR ANY BUFFERS TO BE RETURNED
2281  006414  005237  002452                  INC     ERNUM
2282  006420  012737  000002  006470          MOV     #2,7$           ;SET UP WAIT LOOP
2283  006426                          2$:
2284  006426  004737  031742                  JSR     PC,REQOUT       ;TEST REQUEST OUT OF KMC SETS
2285  006432  000401                          BR      3$
2286  006434  000404                          BR      4$
2287  006436  005337  006470          3$:     DEC     7$
2288  006442  001371                          BNE     2$
2289  006444  000401                          BR      5$              ;ON RECEIVE, NO OUTPUT IS EXPECTED
2290  006446  000404                  4$:     BR      6$              ;OUTPUT REQUESTED IS ERROR #=5
2291                                          ;TEST IF ALL LINES ARE DONE
2292  006450                          5$:
2293  006450  004737  031650                  JSR     PC,GETLIN       ;GET THE NEXT LINE NUMBER
2294  006454  000406                          BR      TST15           ;;ALL LINES TESTED
2295  006456  000674                          BR      1$
2296
2297  006460                          6$:     ;REPORT ERROR
2298  006460  004737  031470                  JSR     PC,GETCSR       ;GET CONTENTS OF THE CSRS
2299  006464  104014                          ERROR+  14
2300  006466  000670                          BR      1$
2301  006470  000000                  7$:     0               ;DELAY COUNT
2302
2303                                          ;;*****************************************************************
2304                                          ;ABORT
2305                                          ;THIS TEST WILL CHECK AN "ABORT OUT" COMMAND WILL RETURN (KILL)
2306                                          ;THE BUFFER CURRENTLY QUEUED TO THE LINE UNDER TEST, BY INITIALIZING
2307                                          ;ALL LINES, SENDING A TRANSMIT BUFFER TO EACH LINE, THEN ISSUEING
2308                                          ;A LINE ABORT OUT COMMAND TO EACH LINE INDIVIDUALLY, TESTING THAT
2309                                          ;ONLY THE BUFFER QUEUED TO THAT LINE IS RETURNED WITH A
2310                                          ;STATUS (SEL6) OF (-6) "TERMINATED ON REQUEST".
2311                                          ;;*****************************************************************
2312                                          ;TEST   15
2313                                          ;;*****************************************************************
2314  006472  000004                  TST15:  SCOPE
2315  006474  012737  000015  002460          MOV     #15,TSTNUM      ;LOAD THE WD OF THIS TEST
2316  006502  004737  030244                  JSR     PC,SETLIN       ;SETUP THE FIRST LINE
2317  006506  012737  006514  001110          MOV     #1$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
2318  006514  012737  000001  002452  1$:     MOV     #1,ERNUM
2319  006522  005037  002462                  CLR     SHBE
```

```
2320  006526  004737  030664                  JSR     PC,INTKMC       ;INITIALIZE KMC-11 FIRMWARE
2321  006532  000434                          BR      20$             ;FIRMWARE FAILED TO INIT #=1
2322  006534  004737  031120                  JSR     PC,INTALL       ;INITIALIZE ALL LINES
2323  006540  000431                          BR      20$             ;INITIALIZE LINES FAILED #=1
2324  006542  004737  031226                  JSR     PC,CLKALL               ;START ALL CLOCK LINES THAT ARE ENABLED
2325  006546  000426                          BR      20$             ;CLOCK COMMAND FAILED
2326  006550  005237  002452                  INC     ERNUM
2327  006554  004737  030244                  JSR     PC,SETLIN       ;INIT LINE
2328  006560                          2$:     ;:
2329  006560  012737  052260  002522          MOV     #TBUF,BUFADR    ;LOAD TRANSMIT BUFFER
2330  006566  012737  010777  002526          MOV     #10777,BUFCNT   ;LARGE BUFFER
2331
2332  006574  043737  002330  002526          BIC     MODMSK,BUFCNT
2333  006602  005037  002524                  CLR     BUFEA
2334  006606  004737  031354                  JSR     PC,XIN          ;LOAD A TRANSMIT BUFFER IN
2335  006612  000404                          BR      20$             ;BUFFER IN FAILED TO LOAD #=2
2336  006614  004737  031650                  JSR     PC,GETLIN       ;GET THE NEXT LINE NUMBER
2337  006620  000403                          BR      27$             ;ALL LINES TESTED
2338  006622  000756                          BR      2$              ;TEST NEXT LINE
2339  006624  000137  007026          20$:    JMP     8$              ;BRANCH HELP TO ERROR
2340                                          ;ABORT EACH BUFFER
2341  006630  004737  030244          27$:    JSR     PC,SETLIN
2342  006634  012737  000003  002452  3$:     MOV     #3,ERNUM
2343  006642  004737  031010                  JSR     PC,REQNX        ;CAN A CONTROL OUT BE EXECUTED?
2344  006646  000766                          BR      20$             ;HUNG OR OUTPUT PENDING #=3
2345  006650  005237  002452                  INC     ERNUM
2346  006654  113777  002454  173404          MOVB    CURLIN,@SEL3    ;LOAD LINE #
2347  006662  112777  000002  173406          MOVB    #2,@SEL7        ;ABORT LINE
2348  006670  005077  173374                  CLR     @SEL4           ;UNUSED
2349  006674  105077  173374                  CLRB    @SEL6           ;UNUSED
2350                                          ;WAIT FOR ABORT COMMAND TO COMPLETE
2351  006700  004737  031772                  JSR     PC,INPDUN       ;TEST THAT INPUT COMPLETED
2352  006704  000747                          BR      20$             ;COMMAND FAILED TO COMPLETE #=4
2353                                          ;TEST THAT BUFFER IS RETURNED
2354  006706  005237  002452          5$:     INC     ERNUM
2355  006712  005237  002452                  INC     ERNUM           ; (ACCOUNT FOR EXTRA ERROR ON RECEIVE)
2356  006716  112737  000200  002462          MOVB    #200,SHBE       ;COMMAND BITS=0 + OUT I/O=0
2357  006724  004737  031742                  JSR     PC,REQOUT       ;TEST REQUEST OUT OF KMC SETS
2358  006730  000436                          BR      8$              ;NO ABORTED BUFFER RETURNED #=6
2359  006732  005237  002452          7$:     INC     ERNUM
2360  006736  122777  000200  173320          CMPB    #200,@SEL2      ;BUFFER OUT + BIT2=0
2361  006744  001030                          BNE     8$              ;B=SEL2 NOT CORRECT, ERROR #=7
2362  006746  005237  002452                  INC     ERNUM
2363  006752  113737  002454  002462          MOVB    CURLIN,SHBE
2364  006760  123777  002454  173300          CMPB    CURLIN,@SEL3    ;CORRECT LINE #?
2365  006766  001017                          BNE     8$              ;B=N ERROR #=10
2366  006770  005237  002452                  INC     ERNUM
2367  006774  112737  177772  002462          MOVB    #-6,SHBE
2368  007002  122777  177772  173264          CMPB    #-6,@SEL6       ;CORRECT STATUS RETURNED?
2369  007010  001006                          BNE     8$              ;B=N ERROR #=11
2370  007012  105077  173246                  CLRB    @SEL2           ;COMMAND DONE
2371                                          ;TEST FOR LINES TO ABORT
2372  007016  004737  031650                  JSR     PC,GETLIN       ;GET THE NEXT LINE NUMBER
2373  007022  000407                          BR      TST16           ;;ALL LINES TESTED
2374  007024  000703                          BR      3$
2375  007026                          8$:     ;REPORT ERROR
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                        007026  004737  031470          JSR     PC,GETCSR       ;GET CONTENTS OF THE CSRS
                        007032  104015                  ERROR+  15
                        007034  105077  173224          CLRB    @SEL2
                        007040  000625                  BR      1$

                                                ;;**********************************************************************
                                                ;ABORT
                                                ;THIS TEST WILL CHECK AN "ABORT IN" COMMAND WILL RETURN (KILL)
                                                ;THE BUFFER CURRENTLY QUEUED TO THE LINE UNDER TEST BY INITIALIZING
                                                ;ALL LINES, SENDING A RECEIVE BUFFER TO EACH LINE, THEN ISSUEING
                                                ;A LINE "ABORT IN" COMMAND TO EACH LINE INDIVIDUALLY, TESTING THAT
                                                ;ONLY THE BUFFER QUEUED TO THAT LINE IS RETURNED WITH A
                                                ;STATUS (SEL6) OF (-6) "TERMINATED ON REQUEST".
                                                ;;**********************************************************************
                                                ;TEST   16
                                                ;;**********************************************************************
                        007042  000004          TST16:  SCOPE
                        007044  012737  000016  002460  MOV     #16,TSTNUM      ;LOAD THE WD OF THIS TEST
                        007052  004737  030244          JSR     PC,SETLIN       ;SETUP THE FIRST LINE
                        007056  012737  007064  001110  MOV     #1$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
                        007064  012737  000001  002452  1$:     MOV     #1,ERNUM
                        007072  005037  002462          CLR     SHBE
                        007076  004737  030664          JSR     PC,INTKMC       ;INITIALIZE KMC-11 FIRMWARE
                        007102  000434                  BR      20$             ;FIRMWARE FAILED TO INIT #=1
                        007104  004737  031120          JSR     PC,INTALL       ;INITIALIZE ALL LINES
                        007110  000431                  BR      20$             ;INITIALIZE LINES FAILED #=1
                        007112  004737  031226          JSR     PC,CLKALL               ;START ALL CLOCK LINES THAT ARE ENABLED
                        007116  000426                  BR      20$                     ;CLOCK COMMAND FAILED
                        007120  005237  002452          INC     ERNUM
                        007124  004737  030244          JSR     PC,SETLIN       ;INIT LINE
                        007130                  2$:     ;;
                        007130  012737  052660  002522  MOV     #RBUF,BUFADR    ;LOAD RECEIVE BUFFER
                        007136  012737  010100  002526  MOV     #10100,BUFCNT

                        007144  043737  002330  002526  BIC     MODMSK,BUFCNT
                        007152  005037  002524          CLR     BUFEA
                        007156  004737  031344          JSR     PC,RIN          ;LOAD A RECEIVE BUFFER IN
                        007162  000404                  BR      20$             ;BUFFER IN FAILED TO LOAD #=2
                        007164  004737  031650          JSR     PC,GETLIN       ;GET THE NEXT LINE NUMBER
                        007170  000403                  BR      27$             ;ALL LINES TESTED
                        007172  000756                  BR      2$              ;TEST NEXT LINE
                        007174  000137  007444          JMP     8$              ;BRANCH HELP TO ERROR
                                                ;ABORT EACH BUFFER
                        007200  004737  030244  27$:    JSR     PC,SETLIN
                        007204  012737  000003  002452  3$:     MOV     #3,ERNUM
                        007212  004737  031000          JSR     PC,REQNC        ;CAN A CONTROL IN BE EXECUTED?
                        007216  000766                  BR      20$             ;HUNG OR OUTPUT PENDING #=3
                        007220  005237  002452          INC     ERNUM
                        007224  113777  002454  173034  MOVB    CURLIN,@SEL3    ;LOAD LINE #
                        007232  112777  000002  173036  MOVB    #2,@SEL7        ;ABORT LINE
                        007240  005077  173024          CLR     @SEL4           ;UNUSED
                        007244  105077  173024          CLRB    @SEL6           ;UNUSED
                                                ;WAIT FOR ABORT COMMAND TO COMPLETE
                        007250  004737  031772          JSR     PC,INPDUN       ;TEST THAT INPUT COMPLETED
                        007254  000747                  BR      20$             ;COMMAND FAILED TO COMPLETE #=4
```

```
2432
2433  007256  005237  002452          5$:     INC     ERNUM
2434  007262  105737  002311                  TSTB    MODE
2435  007266  100406                          BMI     6$
2436                                          ;ONLY IN CCP MODE, CHARACTER MUST BE WRAPPED AROUND AND
2437                                          ;RECEIVED IN ORDER FOR ABORT TO BE PROCESSED
2438  007270  012737  033002  002522          MOV     #TERBUF,BUFADR
2439  007276  004737  031354                  JSR     PC,XIN          ;LOAD A TRANSMIT BUFFER IN
2440  007302  000460                          BR      8$              ;PRIMING TRANSMIT BUFFER IN FAILED TO COMPLETE #=5
2441  007304                          6$:
2442  007304  005237  002452                  INC     ERNUM           ; (ACCOUNT FOR EXTRA ERROR ON RECEIVE)
2443  007310  112737  000204  002462          MOVB    #204,SHBE       ;COMMAND BITS=0 + OUT I/O=1
2444  007316  004737  031742                  JSR     PC,REQOUT       ;TEST REQUEST OUT OF KMC SETS
2445  007322  000450                          BR      8$              ;NO ABORTED BUFFER RETURNED #=6
2446  007324  005237  002452          7$:     INC     ERNUM
2447  007330  122777  000204  172726          CMPB    #204,@SEL2      ;BUFFER OUT + BIT2=1
2448  007336  001042                          BNE     8$              ;B=SEL2 NOT CORRECT, ERROR #=7
2449  007340  005237  002452                  INC     ERNUM
2450  007344  113737  002454  002462          MOVB    CURLIN,SHBE
2451  007352  123777  002454  172706          CMPB    CURLIN,@SEL3    ;CORRECT LINE #?
2452  007360  001031                          BNE     8$              ;B=N ERROR #=10
2453  007362  005237  002452                  INC     ERNUM
2454  007366  112737  177772  002462          MOVB    #-6,SHBE
2455  007374  122777  177772  172672          CMPB    #-6,@SEL6       ;CORRECT STATUS RETURNED?
2456  007402  001020                          BNE     8$              ;B=N ERROR #=11
2457  007404  105077  172654                  CLRB    @SEL2           ;COMMAND DONE
2458  007410  005237  002452                  INC     ERNUM
2459  007414  105737  002311                  TSTB    MODE
2460  007420  100405                          BMI     9$
2461  007422  004737  031742                  JSR     PC,REQOUT       ;TEST REQUEST OUT OF KMC SETS
2462  007426  000406                          BR      8$              ;PRIMING TRANSMIT BUFFER FAILED TO RETURN #=12
2463  007430  105077  172630                  CLRB    @SEL2           ;DISMISS RETURNING XMIT BUFFER IN CCP MODE
2464  007434                          9$:
2465                                          ;TEST FOR LINES TO ABORT
2466  007434  004737  031650                  JSR     PC,GETLIN       ;GET THE NEXT LINE NUMBER
2467  007440  000407                          BR      TST17           ;;ALL LINES TESTED
2468  007442  000660                          BR      3$
2469  007444                          8$:     ;REPORT ERROR
2470  007444  004737  031470                  JSR     PC,GETCSR       ;GET CONTENTS OF THE CSRS
2471  007450  104016                          ERROR+  16
2472  007452  105077  172606                  CLRB    @SEL2
2473  007456  000602                          BR      1$
2474
2475
2476                                          ;;**********************************************************************
2477                                          ;ALTSTA
2478                                          ;THIS TEST CHECKS THAT AN ALTERNATE TRANSMIT BUFFER CAN BE QUEUED
2479                                          ;TO EACH LINE AND IS RETURNED WHEN A LINE ABORT COMMAND
2480                                          ;IS ISSUED.  AFTER EACH LINE IS TESTED FOR RETURNING ITS
2481                                          ;BUFFERS, AN ALTERNATE BUFFER IS QUEUED TO THE LINE
2482
2483                                          ;;**********************************************************************
2484
2485                                          ;TEST   17
2486                                          ;;**********************************************************************
2487  007460  000004                  TST17:  SCOPE
```

```
2488  007462  012737  000017  002460          MOV     #17,TSTNUM      ;LOAD THE WD OF THIS TEST
2489  007470  004737  030244                  JSR     PC,SETLIN       ;SETUP THE FIRST LINE
2490  007474  012737  007502  001110          MOV     #1$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
2491  007502  004737  030244          1$:     JSR     PC,SETLIN
2492  007506  012737  000001  002452          MOV     #1,ERNUM
2493  007514  005037  002462                  CLR     SHBE
2494  007520  004737  030664                  JSR     PC,INTKMC       ;INITIALIZE KMC-11 FIRMWARE
2495  007524  000447                          BR      20$             ;UNIT FAILED TO INITIALIZE #=1
2496  007526  004737  031120                  JSR     PC,INTALL       ;INITIALIZE ALL LINES
2497  007532  000444                          BR      20$             ;LINE INITIALIZE FAILED #=1
2498  007534  004737  031226                  JSR     PC,CLKALL               ;START ALL CLOCK LINES THAT ARE ENABLED
2499  007540  000441                          BR      20$             ;CLOCK COMMAND FAILED
2500  007542  004737  030244                  JSR     PC,SETLIN               ;INITIALIZE LINE #
2501  007546  005237  002452                  INC     ERNUM
2502  007552  012737  017777  002526          MOV     #17777,BUFCNT   ;LARGE BUFFERS
2503  007560  043737  002330  002526          BIC     MODMSK,BUFCNT
2504  007566  005037  002524                  CLR     BUFEA
2505  007572  012737  052260  002522          MOV     #TBUF,BUFADR
2506  007600                          2$:     ;1 BUFFER TO EACH LINE
2507  007600  004737  031354                  JSR     PC,XIN          ;LOAD A TRANSMIT BUFFER IN
2508  007604  000417                          BR      20$             ;BUFFER FAILED TO LOAD #=2
2509  007606  004737  031650                  JSR     PC,GETLIN       ;GET THE NEXT LINE NUMBER
2510  007612  000401                          BR      25$             ;DONE ALL LINES
2511  007614  000771                          BR      2$              ;DO NEXT LINE
2512  007616  004737  030244          25$:    JSR     PC,SETLIN
2513  007622  005237  002452                  INC     ERNUM
2514  007626                          3$:     ;LOAD ALT TO LINE
2515
2516  007626  004737  031354                  JSR     PC,XIN          ;LOAD A TRANSMIT BUFFER IN
2517  007632  000404                          BR      20$             ;BUFFER IN FAILED TO COMPLETE #=3
2518  007634  004737  031650                  JSR     PC,GETLIN       ;GET THE NEXT LINE NUMBER
2519  007640  000403                          BR      31$
2520  007642  000771                          BR      3$
2521  007644  000137  010106          20$:    JMP     9$              ;FORM ERROR JUMP HELP
2522  007650  004737  030244          31$:    JSR     PC,SETLIN
2523                                          ;ISSUE 'LINE ABORT'' TO THE CURRENT LINE
2524  007654  012737  000004  002452  4$:     MOV     #4,ERNUM
2525  007662  005037  010120                  CLR     10$             ;SOFT SWITCH TO INDICATE WHICH BUFFER IS UNDER TEST
2526  007666                          5$:
2527  007666  004737  031010                  JSR     PC,REQNX        ;CAN A CONTROL OUT BE EXECUTED?
2528  007672  000764                          BR      20$             ;OUTPUT REQ. OR FIRMWARE HUNG #=4,14
2529  007674  005237  002452                  INC     ERNUM
2530  007700  113777  002454  172360          MOVB    CURLIN,@SEL3
2531  007706  112777  000002  172362          MOVB    #2,@SEL7        ;ABORT BUFFER
2532  007714  005077  172350                  CLR     @SEL4           ;UNUSED
2533  007720  105077  172350                  CLRB    @SEL6           ;UNUSED
2534  007724  004737  031772                  JSR     PC,INPDUN       ;TEST THAT INPUT COMPLETED
2535  007730  000745                          BR      20$             ;LINE ABORT COMMAND FAILED TO COMPLETE#=5,15
2536  007732  005237  002452                  INC     ERNUM           ; (ALLOW FOR EXTRA ERROR IN RECEIVE TEST)
2537  007736  005237  002452                  INC     ERNUM
2538  007742  012737  000200  002462          MOV     #200,SHBE
2539  007750  004737  031742                  JSR     PC,REQOUT       ;TEST REQUEST OUT OF KMC SETS
2540  007754  000454                          BR      9$              ;NO OUTPUT AFTER ABORTING BUFFERS #=7,17
2541  007756  005237  002452          65$:    INC     ERNUM
2542                                          ;TEST THAT OUTPUT IS A BUFFER OUT + REFLECTS CORRECT I/O BIT
2543  007762  123777  002462  172274          CMPB    SHBE,@SEL2      ;CORRECT STATUS?
```

```
2544  007770  001046                        BNE     9$              ;B=WRONG STATUS IN SEL2  ERROR #=10,20
2545  007772  005237  002452                INC     ERNUM
2546                                        ;TEST THAT OUTPUT BUFFER HAS CORRECT LINE #
2547  007776  113737  002454  002462        MOVB    CURLIN,SHBE
2548  010004  123777  002454  172254        CMPB    CURLIN,@SEL3    ;CORRECT LINE #?
2549  010012  001035                        BNE     9$              ;B=N WRONG LINE # RETURNED ERROR #=11,21
2550  010014  005237  002452                INC     ERNUM
2551                                        ;TEST THAT STATUS (SEL6) IS A "TERMINATED ON REQUEST" STATUS
2552  010020  112737  177772  002462        MOVB    #-6,SHBE
2553  010026  122777  177772  172240        CMPB    #-6,@SEL6       ;CORRECT STATUS
2554  010034  001024                        BNE     9$              ;B=WRONG STATUS - ERROR #=12,22
2555  010036  005237  002452                INC     ERNUM
2556  010042  105077  172216                CLRB    @SEL2           ;COMMAND DONE
2557  010046  005237  002452                INC     ERNUM           ;(ALLOW FOR EXTRA ERROR IN RX TEST)
2558  010052  005137  010120                COM     10$             ;1ST BUFFER OR 2ND?
2559  010056  001303                        BNE     5$              ;B=1ST, DO 2ND
2560  010060  005237  002452                INC     ERNUM
2561  010064  005037  002462                CLR     SHBE
2562                                        ;NOW LOAD ANOTHER ALTERNATE BUFFER
2563  010070  004737  031354                JSR     PC,XIN          ;LOAD A TRANSMIT BUFFER IN
2564  010074  000404                        BR      9$              ;ALT BUFFER FAILED TO LOAD #=24
2565  010076                        8$:     ;CHECK FOR MORE LINES TO TEST
2566  010076  004737  031650                JSR     PC,GETLIN       ;GET THE NEXT LINE NUMBER
2567  010102                        81$:
2568  010102  000410                        BR      TST20           ;;ALL LINES TESTED
2569  010104  000663                        BR      4$              ;DO NEXT LINE
2570
2571  010106                        9$:     ;REPORT ERRORS
2572  010106  004737  031470                JSR     PC,GETCSR       ;GET CONTENTS OF THE CSRS
2573  010112  104017                        ERROR+  17
2574  010114  000137  007502                JMP     1$
2575  010120  000000                10$:    0                       ;SWITCH
2576  010122  000000                15$:    0                       ;DELAY COUNT
2577
2578                                        ;;**************************************************************************
2579                                        ;ALTSTA
2580                                        ;THIS TEST CHECKS THAT AN ALTERNATE RECEIVE BUFFER CAN BE QUEUED
2581                                        ;TO EACH LINE AND IS RETURNED WHEN A LINE ABORT COMMAND
2582                                        ;IS ISSUED.  AFTER EACH LINE IS TESTED FOR RETURNING ITS
2583                                        ;BUFFERS, AN ALTERNATE BUFFER IS QUEUED TO THE LINE
2584
2585                                        ;;**************************************************************************
2586
2587                                        ;TEST   20
2588                                        ;;**************************************************************************
2589  010124  000004                TST20:  SCOPE
2590  010126  012737  000020  002460        MOV     #20,TSTNUM      ;LOAD THE WD OF THIS TEST
2591  010134  004737  030244                JSR     PC,SETLIN       ;SETUP THE FIRST LINE
2592  010140  012737  010146  001110        MOV     #1$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
2593  010146  004737  030244        1$:     JSR     PC,SETLIN
2594  010152  012737  000001  002452        MOV     #1,ERNUM
2595  010160  005037  002462                CLR     SHBE
2596  010164  004737  030664                JSR     PC,INTKMC       ;INITIALIZE KMC-11 FIRMWARE
2597  010170  000447                        BR      20$             ;UNIT FAILED TO INITIALIZE #=1
2598  010172  004737  031120                JSR     PC,INTALL       ;INITIALIZE ALL LINES
2599  010176  000444                        BR      20$             ;LINE INITIALIZE FAILED #=1
```

```
2600  010200  004737  031226                    JSR     PC,CLKALL               ;START ALL CLOCK LINES THAT ARE ENABLED
2601  010204  000441                            BR      20$             ;CLOCK COMMAND FAILED
2602  010206  004737  030244                    JSR     PC,SETLIN               ;INITIALIZE LINE #
2603  010212  005237  002452                    INC     ERNUM
2604  010216  012737  017777  002526            MOV     #17777,BUFCNT   ;LARGE BUFFERS
2605  010224  043737  002330  002526            BIC     MODMSK,BUFCNT
2606  010232  005037  002524                    CLR     BUFEA
2607  010236  012737  052660  002522            MOV     #RBUF,BUFADR
2608  010244                            2$:     ;1 BUFFER TO EACH LINE
2609  010244  004737  031344                    JSR     PC,RIN          ;LOAD A RECEIVE BUFFER IN
2610  010250  000417                            BR      20$             ;BUFFER FAILED TO LOAD #=2
2611  010252  004737  031650                    JSR     PC,GETLIN       ;GET THE NEXT LINE NUMBER
2612  010256  000401                            BR      25$             ;DONE ALL LINES
2613  010260  000771                            BR      2$              ;DO NEXT LINE
2614  010262  004737  030244            25$:    JSR     PC,SETLIN
2615  010266  005237  002452                    INC     ERNUM
2616  010272                            3$:     ;LOAD ALT TO LINE
2617
2618  010272  004737  031344                    JSR     PC,RIN          ;LOAD A RECEIVE BUFFER IN
2619  010276  000404                            BR      20$             ;BUFFER IN FAILED TO COMPLETE #=3
2620  010300  004737  031650                    JSR     PC,GETLIN       ;GET THE NEXT LINE NUMBER
2621  010304  000403                            BR      31$
2622  010306  000771                            BR      3$
2623  010310  000137  010634            20$:    JMP     9$              ;FORM ERROR JUMP HELP
2624  010314  004737  030244            31$:    JSR     PC,SETLIN
2625                                            ;ISSUE "LINE ABORT" TO THE CURRENT LINE
2626  010320  012737  000004  002452    4$:     MOV     #4,ERNUM
2627  010326  005037  010646                    CLR     10$             ;SOFT SWITCH TO INDICATE WHICH BUFFER IS UNDER TEST
2628  010332                            5$:
2629  010332  004737  031000                    JSR     PC,REQNC        ;CAN A CONTROL IN BE EXECUTED?
2630  010336  000764                            BR      20$             ;OUTPUT REQ. OR FIRMWARE HUNG #=4,14
2631  010340  005237  002452                    INC     ERNUM
2632  010344  113777  002454  171714            MOVB    CURLIN,@SEL3
2633  010352  112777  000002  171716            MOVB    #2,@SEL7        ;ABORT BUFFER
2634  010360  005077  171704                    CLR     @SEL4           ;UNUSED
2635  010364  105077  171704                    CLRB    @SEL6           ;UNUSED
2636  010370  004737  031772                    JSR     PC,INPDUN       ;TEST THAT INPUT COMPLETED
2637  010374  000745                            BR      20$             ;LINE ABORT COMMAND FAILED TO COMPLETE#=5,15
2638  010376  005237  002452                    INC     ERNUM           ; (ALLOW FOR EXTRA ERROR IN RECEIVE TEST)
2639  010402  105737  002311                    TSTB    MODE
2640  010406  100406                            BMI     6$
2641                                            ;IN CCP MODE ONLY, A CHARACTER MUST BE WRAPPED AROUND AND
2642                                            ;RECEIVED IN ORDER FOR ABORT TO BE PROCESSED.
2643  010410  012737  033002  002522            MOV     #TERBUF,BUFADR
2644  010416  004737  031354                    JSR     PC,XIN          ;LOAD A TRANSMIT BUFFER IN
2645  010422  000504                            BR      9$              ;PRIMING TRANSMIT BUFFER FAILED TO COMPLETE #=6,16
2646  010424                            6$:
2647  010424  005237  002452                    INC     ERNUM
2648  010430  012737  000204  002462            MOV     #204,SHBE
2649  010436  004737  031742                    JSR     PC,REQOUT       ;TEST REQUEST OUT OF KMC SETS
2650  010442  000474                            BR      9$              ;NO OUTPUT AFTER ABORTING BUFFERS #=7,17
2651  010444  005237  002452            65$:    INC     ERNUM
2652                                            ;TEST THAT OUTPUT IS A BUFFER OUT + REFLECTS CORRECT I/O BIT
2653  010450  123777  002462  171606            CMPB    SHBE,@SEL2      ;CORRECT STATUS?
2654  010456  001066                            BNE     9$              ;B=WRONG STATUS IN SEL2  ERROR #=10,20
2655  010460  005237  002452                    INC     ERNUM
```

```
2656
2657  010464  113737  002454  002462          MOVB    CURLIN,SHBE
2658  010472  123777  002454  171566          CMPB    CURLIN,@SEL3    ;CORRECT LINE #?
2659  010500  001055                          BNE     9$              ;B=N WRONG LINE # RETURNED ERROR #=11,21
2660  010502  005237  002452                  INC     ERNUM
2661                                          ;TEST THAT STATUS (SEL6) IS A ''TERMINATED ON REQUEST'' STATUS
2662  010506  112737  177772  002462          MOVB    #-6,SHBE
2663  010514  122777  177772  171552          CMPB    #-6,@SEL6       ;CORRECT STATUS
2664  010522  001044                          BNE     9$              ;B=WRONG STATUS - ERROR #=12,22
2665  010524  005237  002452                  INC     ERNUM
2666  010530  105077  171530                  CLRB    @SEL2           ;COMMAND DONE
2667  010534  105737  002311                  TSTB    MODE
2668  010540  100415                          BMI     7$
2669  010542  012737  000127  010650          MOV     #127,15$        ;SET UP WAIT LOOP
2670  010550                          11$:
2671  010550  004737  031742                  JSR     PC,REQOUT       ;TEST REQUEST OUT OF KMC SETS
2672  010554  000401                          BR      12$
2673  010556  000404                          BR      13$
2674  010560  005337  010650          12$:    DEC     15$
2675  010564  001371                          BNE     11$
2676  010566  000422                          BR      9$              ;PRIMING XMIT BUFFER NOT RETURNED #-13,23
2677  010570  105077  171470          13$:    CLRB    @SEL2           ;ACCOUNT FOR RETURNING XMIT BUFFER
2678  010574                          7$:
2679  010574  005237  002452                  INC     ERNUM           ;(ALLOW FOR EXTRA ERROR IN RX TEST)
2680  010600  005137  010646                  COM     10$             ;1ST BUFFER OR 2ND?
2681  010604  001252                          BNE     5$              ;B=1ST, DO 2ND
2682  010606  005237  002452                  INC     ERNUM
2683  010612  005037  002462                  CLR     SHBE
2684                                          ;NOW LOAD ANOTHER ALTERNATE BUFFER
2685  010616  004737  031344                  JSR     PC,RIN          ;LOAD A RECEIVE BUFFER IN
2686  010622  000404                          BR      9$              ;ALT BUFFER FAILED TO LOAD #=24
2687  010624                          8$:     ;CHECK FOR MORE LINES TO TEST
2688  010624  004737  031650                  JSR     PC,GETLIN       ;GET THE NEXT LINE NUMBER
2689  010630                          81$:
2690  010630  000410                          BR      TST21           ;;ALL LINES TESTED
2691  010632  000632                          BR      4$              ;DO NEXT LINE
2692
2693  010634                          9$:     ;REPORT ERRORS
2694  010634  004737  031470                  JSR     PC,GETCSR       ;GET CONTENTS OF THE CSRS
2695  010640  104020                          ERROR+  20
2696  010642  000137  010146                  JMP     1$
2697  010646  000000                  10$:    0                       ;SWITCH
2698  010650  000000                  15$:    0                       ;DELAY COUNT
2699
2700                                  ;;**********************************************************************
2701                                          ;ALTBUFS
2702                                          ;THIS TEST CHECKS THAT ALTERNATE BUFFERS CAN BE QUEUED TO EACH
2703                                          ;LINE AND ARE PROPERLY HANDLED BY THE FIRMWARE.  A PROGRESSION IS
2704                                          ;DONE, TESTING THE QUEUEING OF ALTERNATE BUFFERS TO EACH LINE.
2705                                          ;THE CURRENT LINE IS QUEUED 2 RECEIVE AND 2 TRANSMIT BUFFERS
2706                                          ;AND A TEST THAT THE BUFFERS FOR THE CURRENT LINE ARE RETURNED CORRECTLY.
2707
2708                                  ;;**********************************************************************
2709
2710                                          ;TEST   21
2711                                  ;;**********************************************************************
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2712  010652  000004                    TST21:  SCOPE
2713  010654  012737  000021  002460            MOV     #21,TSTNUM      ;LOAD THE WD OF THIS TEST
2714  010662  004737  030244                    JSR     PC,SETLIN       ;SETUP THE FIRST LINE
2715  010666  012737  010674  001110            MOV     #1$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
2716  010674  012737  000001  002452  1$:       MOV     #1,ERNUM
2717  010702  005037  002462                    CLR     SHBE
2718  010706  004737  030664                    JSR     PC,INTKMC       ;INITIALIZE KMC-11 FIRMWARE
2719  010712  000452                            BR      65$             ;KMC FAILED TO INITIALIZE #=1
2720  010714  004737  031120                    JSR     PC,INTALL       ;INITIALIZE ALL LINES
2721  010720  000447                            BR      65$             ;LINE INITIALIZE FAILED #=1
2722  010722  004737  031274                    JSR     PC,STCLK        ;SET MAINT LOOP + START CLOCK
2723  010726  000444                            BR      65$             ;MAINTENANCE COMMAND NOT ISSUED #=1
2724  010730  004737  031714                    JSR     PC,SYNTIM       ;ALLOW TIME FOR SYNC
2725  010734  005237  002452                    INC     ERNUM
2726  010740  005037  002524                    CLR     BUFEA
2727  010744  012737  010020  002526            MOV     #10020,BUFCNT   ;RECEIVE BUFFER LONGER THAN XMIT BUFFER
2728  010752  043737  002330  002526            BIC     MODMSK,BUFCNT
2729  010760  005037  011402          4$:       CLR     14$             ;TIMES SWITCH
2730  010764  012737  052660  002522            MOV     #RBUF,BUFADR
2731  010772                             5$:
2732  010772  004737  031344                    JSR     PC,RIN          ;LOAD A RECEIVE BUFFER IN
2733  010776  000567                            BR      11$             ;B=RECEIVE BUFFER FAILED TO LOAD #=2
2734  011000  005137  011402                    COM     14$             ;1ST OR 2ND BUFFER IN
2735  011004  001372                            BNE     5$
2736  011006  005237  002452                    INC     ERNUM
2737  011012  012737  052260  002522            MOV     #TBUF,BUFADR    ;FOR COMPATABILITY WITH CCP MODE, USE BUFFER
2738  011020  012737  010005  002526            MOV     #10005,BUFCNT   ;STARTING WITH SOH & ENDING WITH ETX
2739  011026  043737  002330  002526            BIC     MODMSK,BUFCNT
2740  011034                             6$:
2741  011034  004737  031354                    JSR     PC,XIN          ;LOAD A TRANSMIT BUFFER IN
2742  011040  000546                    65$:    BR      11$             ;B=TRANSMIT BUFFER FAILED TO LOAD #=3
2743  011042  005137  011402                    COM     14$             ;1ST OR 2ND BUFFER IN
2744  011046  001372                            BNE     6$
2745                                            ;NOW TEST THAT THE BUFFERS QUEUED TO THE CURRENT LINE RETURN CORRECTLY
2746                                            ;THERE MUST BE 2 RECEIVE AND 2 TRANSMIT
2747  011050  005037  011402                    CLR     14$             ;COUNT TOTAL BUFFERS
2748  011054  005037  011400                    CLR     13$             ;COUNT RECEIVE BUFFERS
2749  011060  012737  000004  002452  9$:       MOV     #4,ERNUM
2750  011066  005037  002462                    CLR     SHBE
2751  011072  004737  031742                    JSR     PC,REQOUT       ;TEST REQUEST OUT OF KMC SETS
2752  011076  000527                            BR      11$             ;NO OUTPUT REQ. ERR #=4
2753  011100  005237  002452                    INC     ERNUM
2754  011104  013737  002454  002462            MOV     CURLIN,SHBE     ;SHOW CURRENT LINE #
2755  011112  123777  002462  171146            CMPB    SHBE,@SEL3      ;CORRECT LINE #?
2756  011120  001116                            BNE     11$             ;B=NO ERROR #=5
2757  011122  005237  002452                    INC     ERNUM
2758  011126  012737  000001  002462            MOV     #1,SHBE         ;RETURN STATUS SHOULD BE = 1 (END COUNT REACHED)
2759                                            ;FOR XMIT AND 2 (EOM/ETX) FOR RECV
2760  011134  132777  000004  171122            BITB    #4,@SEL2        ;CHECK FOR RECV
2761  011142  001402                            BEQ     91$             ;SKIP IF XMIT
2762  011144  005237  002462                    INC     SHBE            ;RECV=2
2763  011150  123777  002462  171116  91$:      CMPB    SHBE,@SEL6      ;CORRECT STATUS?
2764  011156  001077                            BNE     11$             ;B=N #=6
2765  011160  005237  002452                    INC     ERNUM
2766                                            ;FIND WHICH ENDING ADDRESS SHOULD BE TESTED
2767  011164  132777  000004  171072            BITB    #4,@SEL2
```

```
2768  011172  001420                        BEQ     15$             ;B=TRANSMIT BUFFER
2769  011174  012737  052665  002462        MOV     #RBUF+5,SHBE    ;RECEIVE BUFFER
2770  011202  105737  002311                TSTB    MODE
2771  011206  100015                        BPL     18$
2772  011210  105737  002316                TSTB    CLKDAT          ;CHECK INTERNAL OR EXTERNAL
2773  011214  100415                        BMI     16$
2774  011216  105737  002314                TSTB    CRC32F          ;EXTERNAL, CHECK CRC-32 ENABLED?
2775  011222  100012                        BPL     16$
2776  011224  062737  000004  002462        ADD     #4,SHBE         ;YES, ADD 4 BYTES FOR APPENDED CRC
2777  011232  000406                        BR      16$
2778  011234  012737  052265  002462  15$:  MOV     #TBUF+5,SHBE    ;TRANSMIT BUFFER
2779  011242  105737  002311        18$:  TSTB    MODE            ;CHECK MODE
2780  011246  100003                        BPL     19$             ;SKIP IF CCP
2781  011250  062737  000005  002462  16$:  ADD     #5,SHBE         ;IF BOP, CONVERT WORD COUNT INTO BYTES
2782  011256  023777  002462  171004  19$:  CMP     SHBE,@SEL4      ;CORRECT ADDRESS?
2783  011264  001034                        BNE     11$             ;B=NO ERR #=7
2784  011266  132777  000004  170770        BITB    #4,@SEL2        ;WHAT BUFFER?
2785  011274  001002                        BNE     10$             ;B=XMIT
2786  011276  005237  011400                INC     13$             ;1 TO THE REC.
2787  011302  005237  011402        10$:  INC     14$             ;1 TO THE TOTAL
2788  011306  005077  170752                CLR     @SEL2           ;SHOW COMMAND DONE
2789  011312  005237  002452                INC     ERNUM
2790  011316  013737  011400  002462        MOV     13$,SHBE        ;SHOW # OF REC. BUFFERS
2791  011324  022737  000004  011402        CMP     #4,14$          ;4 YET?
2792  011332  001252                        BNE     9$              ;B=N TRY AGAIN
2793  011334  022737  000002  011400        CMP     #2,13$          ;ARE THERE 2 REC. + 2 XMIT?
2794  011342  001005                        BNE     11$             ;REPORT ERR #=10
2795  011344  005237  002452                INC     ERNUM
2796  011350  004737  031742                JSR     PC,REQOUT       ;TEST REQUEST OUT OF KMC SETS
2797  011354  000405                        BR      17$             ;OK NO MORE OUTPUT REQUESTED #11=ADDITIONAL OUT REQ.
2798  011356                        11$:    ;REPORT ERROR
2799  011356  004737  031470                JSR     PC,GETCSR       ;GET CONTENTS OF THE CSRS
2800  011362  104021                        ERROR+  21
2801  011364  000137  010674        12$:  JMP     1$              ;LOOP @ 1$
2802  011370                        17$:
2803  011370  004737  031650                JSR     PC,GETLIN       ;GET THE NEXT LINE NUMBER
2804  011374                        81$:
2805  011374  000403                        BR      TST22           ;;ALL LINES TESTED
2806  011376  000772                        BR      12$
2807  011400  000000                13$:    0                       ;# OF RECEIVE BUFFERS RETURNED
2808  011402  000000                14$:    0                       ;# OF TOTAL RECEIVED + COUNT FOR BUFFERS LOADED
2809
2810
2811                                ;;*****************************************************************
2812                                        ;NXM
2813                                        ;THIS TEST CHECKS THAT A NON-EXISTANT MEMORY STATUS (-5) WILL BE
2814                                        ;RETURNED WITH A RECEIVE BUFFER OUT.  THE NON-EXISTAND MEMORY
2815                                        ;LOCATION IS I/O PAGE LOCATION 10 TO WHICH THE RECEIVE BUFFER IS
2816                                        ;ADDRESSED.
2817
2818                                ;;*****************************************************************
2819
2820                                        ;TEST   22
2821                                ;;*****************************************************************
2822  011404  000004                TST22:  SCOPE
2823  011406  012737  000022  002460        MOV     #22,TSTNUM      ;LOAD THE WD OF THIS TEST
```

```
2824  011414  004737  030244                  JSR     PC,SETLIN       ;SETUP THE FIRST LINE
2825  011420  012737  011426  001110          MOV     #1$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
2826  011426  012737  000001  002452  1$:     MOV     #1,ERNUM
2827  011434  005037  002462                  CLR     SHBE
2828  011440  004737  030664                  JSR     PC,INTKMC       ;INITIALIZE KMC-11 FIRMWARE
2829  011444  000504                          BR      2$              ;FIRMWARE FAILED TO INITIALIZE #=1
2830  011446  004737  031204                  JSR     PC,INTLNE       ;INITIALIZE LINE (# IN CURLIN)
2831  011452  000501                          BR      2$              ;LINE FAILED TO INITIALIZE #=1
2832  011454  004737  031274                  JSR     PC,STCLK        ;SET MAINT LOOP + START CLOCK
2833  011460  000476                          BR      2$              ;MAINTENANCE COMMAND NOT ISSUED #=1
2834  011462  004737  031714                  JSR     PC,SYNTIM       ;ALLOW TIME FOR SYNC
2835  011466  005237  002452                  INC     ERNUM
2836                                          ;LOAD THE RECEIVE BUFFER AT I/O PAGE ADDRESS 10
2837  011472  012737  010002  002526          MOV     #10002,BUFCNT
2838  011500  043737  002330  002526          BIC     MODMSK,BUFCNT
2839  011506  012737  140000  002524          MOV     #140000,BUFEA   ;EA-BITS
2840  011514  012737  177770  002522          MOV     #-10,BUFADR     ;I/O PAGE ADDR. 10
2841  011522  004737  031344                  JSR     PC,RIN          ;LOAD A RECEIVE BUFFER IN
2842  011526  000453                          BR      2$              ;REC.BUFFER FAILED TO LOAD #=2
2843  011530  005237  002452                  INC     ERNUM
2844                                          ;LOAD THE TRANSMIT BUFFER
2845  011534  012737  010004  002526          MOV     #10004,BUFCNT
2846  011542  043737  002330  002526          BIC     MODMSK,BUFCNT
2847  011550  005037  002524                  CLR     BUFEA
2848  011554  012737  052260  002522          MOV     #TBUF,BUFADR
2849  011562  004737  031354                  JSR     PC,XIN          ;LOAD A TRANSMIT BUFFER IN
2850  011566  000433                          BR      2$              ;TRANSMIT BUFFER FAILED TO LOAD #=3
2851  011570  005237  002452                  INC     ERNUM
2852  011574  012737  000204  002462          MOV     #204,SHBE
2853                                          ;TEST FOR AN OUTPUT RESPONSE
2854  011602  004737  031742                  JSR     PC,REQOUT       ;TEST REQUEST OUT OF KMC SETS
2855  011606  000423                          BR      2$              ;NO OUTPUT RESPONSE #=4
2856  011610  005237  002452                  INC     ERNUM
2857  011614  123777  002462  170442          CMPB    SHBE,@SEL2
2858  011622  001015                          BNE     2$              ;B=RETURN NOT A RECEIVE BUFFER #=5
2859  011624  005237  002452                  INC     ERNUM
2860  011630  112737  177773  002462          MOVB    #-5,SHBE
2861  011636  123777  002462  170430          CMPB    SHBE,@SEL6      ;IS RETURNED STATUS A NON-EXISTANT MEMORY?
2862  011644  001004                          BNE     2$              ;B = ERROR #6
2863  011646  004737  031650                  JSR     PC,GETLIN       ;GET THE NEXT LINE NUMBER
2864  011652  000405                          BR      TST23           ;;EXIT
2865  011654  000664                          BR      1$              ;TEST NEXT LINE
2866
2867  011656                          2$:
2868  011656  004737  031470                  JSR     PC,GETCSR       ;GET CONTENTS OF THE CSRS
2869  011662  104022                          ERROR+  22
2870  011664  000660                          BR      1$
2871
2872
2873                                  ;;**************************************************************************
2874                                          ;TERMXB
2875                                          ;CCP MODE ONLY
2876                                          ;THIS TEST WILL CHECK THAT THE 2 CHARACTERS ETX AND ETB
2877                                          ;ARE DETECTED AND PROPERLY RETURN THE BUFFER OUT COMMAND STATUS.
2878                                          ;BOTH CHARACTERS ARE TESTED INDIVIDUALLY WITH EACH PREFIXED
2879                                          ;BY AN SOH THEN A STX
```

```
                                ;;*****************************************************************
                                ;TEST   23
                                ;;*****************************************************************
011666  000004                  TST23:  SCOPE
011670  012737  000023  002460          MOV     #23,TSTNUM      ;LOAD THE WD OF THIS TEST
011676  004737  030244                  JSR     PC,SETLIN       ;SETUP THE FIRST LINE
011702  012737  011740  001110          MOV     #1$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
011710  105737  002311                  TSTB    MODE            ;CCP MODE ONLY
011714  100002                          BPL     17$
011716  000137  012230                  JMP     2$
011722  005037  001160          17$:    CLR     $TMP0           ;SWITCH FOR CHARACTER SOH & STX
011726  005037  001162                  CLR     $TMP1           ;SWITCH FOR CHARACTER ETX & ETB
011732  012737  033002  012256          MOV     #TERBUF,4$      ;
011740  012737  000005  002526  1$:     MOV     #5,BUFCNT
011746  005037  002524                  CLR     BUFEA
011752  012737  000001  002452          MOV     #1,ERNUM
011760  005037  002462                  CLR     SHBE
011764  004737  030664                  JSR     PC,INTKMC       ;INITIALIZE KMC-11 FIRMWARE
011770  000522                          BR      3$              ;FIRMWARE FAILED TO INITIALIZE #=1
011772  004737  031204                  JSR     PC,INTLNE       ;INITIALIZE LINE (# IN CURLIN)
011776  000517                          BR      3$              ;LINE FAILED TO INITIALIZE #=1
012000  004737  031274                  JSR     PC,STCLK        ;SET MAINT LOOP + START CLOCK
012004  000514                          BR      3$              ;MAINTENANCE COMMAND NOT ISSUED #=1
012006  004737  031714                  JSR     PC,SYNTIM       ;ALLOW TIME FOR SYNC
012012  005237  002452                  INC     ERNUM
012016  012737  052660  002522          MOV     #RBUF,BUFADR    ;LOAD A RECEIVE BUFFER
012024  004737  031344                  JSR     PC,RIN          ;LOAD A RECEIVE BUFFER IN
012030  000502                          BR      3$              ;RECEIVE BUFFER FAILED TO LOAD #=2
012032  005237  002452                  INC     ERNUM
012036  013737  012256  002522          MOV     4$,BUFADR       ;CURRENT BUFFER ADDRESS
012044  005337  002526                  DEC     BUFCNT
012050  004737  031354                  JSR     PC,XIN          ;LOAD A TRANSMIT BUFFER IN
012054  000470                          BR      3$              ;TRANSMIT BUFFER FAILED TO LOAD #=3
012056  005237  002452                  INC     ERNUM
012062  004737  031714                  JSR     PC,SYNTIM       ;WAIT A WHILE
012066  004737  031742                  JSR     PC,REQOUT       ;TEST REQUEST OUT OF KMC SETS
012072  000461                          BR      3$              ;NO RESPONSE FROM THE ENDING CHARACTER #=4
012074  005237  002452                  INC     ERNUM
012100  012737  000204  002462          MOV     #204,SHBE       ;IS COMMAND A BUFFER OUT?
012106  004737  031522                  JSR     PC,RBONLY       ;SKIP XMIT
012112  123777  002462  170144          CMPB    SHBE,@SEL2
012120  001046                          BNE     3$              ;B=NO COMMAND IS NOT A RECEIVE BUFFER OUT #=5
012122  005237  002452                  INC     ERNUM
012126  012737  052664  002462          MOV     #RBUF+4,SHBE    ;CORRECT ENDING MEMORY ADDRES?
012134  023777  002462  170126          CMP     SHBE,@SEL4      ;
012142  001035                          BNE     3$              ;B=NO ENDING MEMORY ADDRESS INCORRECT #=6
                                ;FIND THE CORRECT RETURN STATUS VALUE
012144  005237  002452                  INC     ERNUM
012150  012737  000002  002462          MOV     #2,SHBE         ;LOAD ETX RETURN STATUS VALUE
012156  013700  012256                  MOV     4$,R0
012162  132760  000020  000003          BITB    #20,3(R0)       ;WAS CHAR. ETX OR ETB
012170  001402                          BEQ     15$             ;B=ETX
012172  005237  002462                  INC     SHBE            ;MAKE RET. STATUS AN ETB (3) DETECTED
012176  123777  002462  170070  15$:    CMPB    SHBE,@SEL6      ;CORRECT TERMINATION STATUS
```

```
2936  012204  001014                          BNE     3$              ;B=NO #=7
2937  012206  062737  000004  012256          ADD     #4,4$           ;MOVE TO NEXT VALUE
2938  012214  022737  033022  012256          CMP     #TERBUF+20,4$   ;DONE?
2939  012222  001246                          BNE     1$              ;B=NO
2940  012224  004737  031650                  JSR     PC,GETLIN       ;GET NEXT LINE NUMBER
2941  012230                          2$:
2942  012230  000413                          BR      TST24           ;;DONE
2943  012232  000137  011722                  JMP     17$             ;DO NEXT LINE
2944
2945
2946                                          ;REPORT ERRORS
2947  012236  017737  000014  002464  3$:     MOV     @4$,WAS ;SHOW COMBINATION FAILING
2948  012244  004737  031470                  JSR     PC,GETCSR       ;GET CONTENTS OF THE CSRS
2949  012250  104023                          ERROR+  23
2950  012252  000137  011740                  JMP     1$
2951  012256  000000                  4$:     0                       ;ADDRESS OF CURRENT TRANSMIT BUFFER
2952
2953
2954                                  ;;**************************************************************************
2955                                          ;LRCTST
2956                                          ;CCP MODE ONLY
2957                                          ;THIS TEST CHECKS THAT AN LRC ERROR CONDITION CAN BE DETECTED
2958                                          ;AND RETURNS THE RECEIVE BUFFER WITH AN LRC CONDITION.
2959                                          ;TO GENERATE THE LRC ERROR A SPECIALLY FORMATTED BUFFER IS OUTPUT
2960                                          ;WITH AN ADDITIONAL CHARACTER FOLLOWING THE 'ETX' WHICH THE RECEIVER
2961                                          ;INTERPRETS AS THE LRC CHARACTER
2962
2963                                  ;;**************************************************************************
2964
2965                                          ;TEST   24
2966                                  ;;**************************************************************************
2967  012260  000004                  TST24:  SCOPE
2968  012262  012737  000024  002460          MOV     #24,TSTNUM      ;LOAD THE WD OF THIS TEST
2969  012270  004737  030244                  JSR     PC,SETLIN       ;SETUP THE FIRST LINE
2970  012274  012737  012314  001110          MOV     #1$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
2971  012302  105737  002311                  TSTB    MODE            ;CCP MODE ONLY
2972  012306  100002                          BPL     1$
2973  012310  000137  012542                  JMP     2$              ;
2974  012314  005037  002462          1$:     CLR     SHBE
2975  012320  012737  000001  002452          MOV     #1,ERNUM
2976  012326  005037  002524                  CLR     BUFEA
2977  012332  012737  000010  002526          MOV     #10,BUFCNT
2978  012340  004737  030664                  JSR     PC,INTKMC       ;INITIALIZE KMC-11 FIRMWARE
2979  012344  000501                          BR      3$              ;FIRMWARE FAILED TO INITIALIZE #=1
2980  012346  004737  031204                  JSR     PC,INTLNE       ;INITIALIZE LINE (# IN CURLIN)
2981  012352  000476                          BR      3$              ;LINE FAILED TO INITIALIZE #=1
2982  012354  004737  031274                  JSR     PC,STCLK        ;START CLOCK
2983  012360  000473                          BR      3$              ;MAINTENANCE COMMAND NOT ISSUED #=1
2984  012362  005237  002452                  INC     ERNUM
2985  012366  012737  052660  002522          MOV     #RBUF,BUFADR
2986  012374  004737  031344                  JSR     PC,RIN          ;LOAD A RECEIVE BUFFER IN
2987  012400  000463                          BR      3$              ;RECEIVE BUFFER FAILED TO LOAD #=2
2988  012402  005237  002452                  INC     ERNUM
2989  012406  012737  033026  002522          MOV     #LRCBUF,BUFADR
2990  012414  004737  031354                  JSR     PC,XIN          ;LOAD A TRANSMIT BUFFER IN
2991  012420  000453                          BR      3$              ;TRANSMIT BUFFER FAILED TO LOAD #=3
```

```
2992  012422  005237  002452                  INC     ERNUM
2993  012426  004737  031714                  JSR     PC,SYNTIM       ;WAIT A WHILE
2994  012432  004737  031742                  JSR     PC,REQOUT       ;TEST REQUEST OUT OF KMC SETS
2995  012436  000444                          BR      3$              ;NO RESPONSE FROM THE TRANSFER #=4
2996  012440  005237  002452                  INC     ERNUM
2997  012444  012737  000204  002462          MOV     #204,SHBE       ;BUFFER OUT COMMAND?
2998  012452  004737  031522                  JSR     PC,RBONLY       ;SKIP XMIT
2999  012456  123777  002462  167600          CMPB    SHBE,@SEL2
3000  012464  001031                          BNE     3$              ;B=NO ERROR #=5
3001  012466  005237  002452                  INC     ERNUM
3002  012472  012737  052666  002462          MOV     #RBUF+6,SHBE    ;RETURN ADDRESS
3003  012500  023777  002462  167562          CMP     SHBE,@SEL4      ;CORRECT?
3004  012506  001020                          BNE     3$              ;B=N ERR #=6
3005  012510  005237  002452                  INC     ERNUM
3006  012514  005037  002462                  CLR     SHBE
3007  012520  112737  177774  002462          MOVB    #-4,SHBE
3008  012526  123777  002462  167540          CMPB    SHBE,@SEL6      ;STATUS = LRC ERROR
3009  012534  001005                          BNE     3$              ;B=NO #=7
3010  012536  004737  031650                  JSR     PC,GETLIN       ;DO NEXT LINE
3011  012542                          2$:
3012  012542  000407                          BR      TST25           ;;DONE
3013  012544  000137  012314                  JMP     1$
3014
3015                                          ;REPORT ERRORS
3016  012550                          3$:
3017  012550  004737  031470                  JSR     PC,GETCSR       ;GET CONTENTS OF THE CSRS
3018  012554  104024                          ERROR+  24
3019  012556  000137  012314                  JMP     1$
3020
3021
3022
3023                                    ;;*****************************************************************
3024
3025                                          ;PARTST
3026                                          ;CCP MODE ONLY
3027                                          ;THIS TEST CHECKS THAT A PARITY ERROR CONDITION CAN BE DETECTED
3028                                          ;AND RETURNS THE RECEIVE BUFFER WITH A PARITY CONDITION.
3029                                          ;TO GENERATE THE PARITY ERROR A SPECIALLY FORMATTED BUFFER BUFFER IS OUTPUT
3030                                          ;WITH AN EVEN PARITY DATA CHARACTER FOLLOWING THE CONTROL CHARACTERS
3031
3032                                    ;;*****************************************************************
3033
3034                                          ;TEST   25
3035                                    ;;*****************************************************************
3036  012562  000004                  TST25:  SCOPE
3037  012564  012737  000025  002460          MOV     #25,TSTNUM      ;LOAD THE WD OF THIS TEST
3038  012572  004737  030244                  JSR     PC,SETLIN       ;SETUP THE FIRST LINE
3039  012576  012737  012616  001110          MOV     #1$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
3040  012604  105737  002311                  TSTB    MODE            ;CCP MODE ONLY
3041  012610  100002                          BPL     1$
3042  012612  000137  013044                  JMP     2$              ;
3043  012616  005037  002462          1$:     CLR     SHBE
3044  012622  012737  000001  002452          MOV     #1,ERNUM
3045  012630  005037  002524                  CLR     BUFEA
3046  012634  012737  000010  002526          MOV     #10,BUFCNT
3047  012642  004737  030664                  JSR     PC,INITKMC      ;INITIALIZE KMC-11 FIRMWARE
```

```
3048  012646  000501                          BR      3$              ;FIRMWARE FAILED TO INITIALIZE #=1
3049  012650  004737  031204                  JSR     PC,INTLNE       ;INITIALIZE LINE (# IN CURLIN)
3050  012654  000476                          BR      3$              ;LINE FIALED TO INITIALIZE #=1
3051  012656  004737  031274                  JSR     PC,STCLK        ;START CLOCK
3052  012662  000473                          BR      3$              ;MAINTENANCE COMMAND NOT ISSUED #=1
3053  012664  005237  002452                  INC     ERNUM
3054  012670  012737  052660  002522          MOV     #RBUF,BUFADR
3055  012676  004737  031344                  JSR     PC,RIN          ;LOAD A RECEIVE BUFFER IN
3056  012702  000463                          BR      3$              ;RECEIVE BUFFER FAILED TO LOAD #=2
3057  012704  005237  002452                  INC     ERNUM
3058  012710  012737  033036  002522          MOV     #PERBUF,BUFADR
3059  012716  004737  031354                  JSR     PC,XIN          ;LOAD A TRANSMIT BUFFER IN
3060  012722  000453                          BR      3$              ;TRANSMIT BUFFER FIALED TO LOAD #=3
3061  012724  005237  002452                  INC     ERNUM
3062  012730  012737  000204  002462          MOV     #204,SHBE       ;EXPECT BUFFER OUT COMMAND
3063  012736  004737  031714                  JSR     PC,SYNTIM       ;WAIT A WHILE
3064  012742  004737  031742                  JSR     PC,REQOUT       ;TEST REQUEST OUT OF KMC SETS
3065  012746  000441                          BR      3$              ;NO RESPONSE FROM THE TRANSFER #=4
3066  012750  005237  002452                  INC     ERNUM
3067  012754  004737  031522                  JSR     PC,RBONLY       ;SKIP XMIT
3068  012760  123777  002462  167276          CMPB    SHBE,@SEL2      ;IS IT A BUFFER OUT COMMAND?
3069  012766  001031                          BNE     3$              ;B=NO ERROR #=5
3070  012770  005237  002452                  INC     ERNUM
3071  012774  012737  052663  002462          MOV     #RBUF+3,SHBE    ;RETURN ADDRESS
3072  013002  023777  002462  167260          CMP     SHBE,@SEL4      ;CORRECT?
3073  013010  001020                          BNE     3$              ;B=N ERR #=6
3074  013012  005237  002452                  INC     ERNUM
3075  013016  005037  002462                  CLR     SHBE
3076  013022  112737  177775  002462          MOVB    #-3,SHBE
3077  013030  123777  002462  167236          CMPB    SHBE,@SEL6      ;STATUS = PARITY ERROR
3078  013036  001005                          BNE     3$              ;B=NO #=7
3079  013040  004737  031650                  JSR     PC,GETLIN       ;DO NEXT LINE
3080  013044                          2$:
3081  013044  000407                          BR      TST26           ;;DONE
3082  013046  000137  012616                  JMP     1$
3083
3084                                          ;REPORT ERRORS
3085  013052                          3$:
3086  013052  004737  031470                  JSR     PC,GETCSR       ;GET CONTENTS OF THE CSRS
3087  013056  104025                          ERROR+  25
3088  013060  000137  012616                  JMP     1$
3089
3090
3091
3092                                    ;;*****************************************************************
3093                                          ;CHRCNT
3094                                          ;THIS TEST CHECKS THAT THE CHARACTER COUNT WILL CORRECTLY COUNT
3095                                          ;TO THE HIGHEST VALUE OF CORE AVAILABLE (ABOVE THE DIAGNOSTIC)
3096                                          ;BY USING THE SAME BUFFER FOR RECEIVE AS FOR TRANSMIT
3097                                          ;AND TESTING THAT THE ENDING MEMORY ADDRESS RETURNED
3098                                          ;OF BOTH THE BUFFERS (XMIT AND RECEIVE) ARE THE SAME
3099
3100                                    ;;*****************************************************************
3101
3102                                          ;TEST   26
3103                                    ;;*****************************************************************
```

```
3104  013064  000004                    TST26:  SCOPE
3105  013066  012737  000026  002460            MOV     #26,TSTNUM      ;LOAD THE WD OF THIS TEST
3106  013074  004737  030244                    JSR     PC,SETLIN       ;SETUP THE FIRST LINE
3107  013100  012737  013120  001110            MOV     #1$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
3108                                            ;CHECK THAT TEST CAN BE RUN (SUFFICIENT CORE)
3109  013106  005737  002534                    TST     CCTST           ;IS THERE CORE AVAILABLE?
3110  013112  001572                            BEQ     5$              ;B=NO
3111  013114  004737  030244                    JSR     PC,SETLIN
3112  013120  012737  000001  002452  1$:       MOV     #1,ERNUM
3113  013126  005037  002462                    CLR     SHBE
3114  013132  013701  002534                    MOV     CCTST,R1        ;FIND THE ADDRES THAT SHOULD BE RETURNED
3115  013136  105737  002311                    TSTB    MODE
3116  013142  100403                            BMI     10$
3117  013144  010137  013526                    MOV     R1,8$           ;IN CCP, LENGTH IS ACTUAL CHAR COUNT
3118  013150  000417                            BR      15$
3119  013152  020127  002000          10$:      CMP     R1,#2000        ;IN BOP MODE,
3120  013156  101402                            BLOS    11$             ;  MAX COUNT=2000 BYTES
3121  013160  012701  002000                    MOV     #2000,R1
3122  013164  010137  013526          11$:      MOV     R1,8$           ;  SAVE BUFFER SIZE
3123  013170  006237  013526                    ASR     8$              ;  CHANGE TO WORD COUNT
3124  013174  042737  177000  013526            BIC     #177000,8$      ;  MASK TO 9 BITS
3125  013202  062737  010000  013526            ADD     #10000,8$       ;  FIX BYTE COUNT
3126  013210  013702  002532          15$:      MOV     BADDR,R2        ;GET START OF TRANSMIT BUFFER
3127  013214  004737  032542                    JSR     PC,MEMFIL       ;AND FILL WITH ALLOWED INCREMENTING PATTERN
3128  013220  063701  002532                    ADD     BADDR,R1        ;SET UP ENDING BUFFER ADDRESS
3129  013224  004737  030664                    JSR     PC,INTKMC       ;INITIALIZE KMC-11 FIRMWARE
3130  013230  000530                            BR      6$              ;FIRMWARE FAILED TO INITIALIZE #=1
3131  013232  004737  031204                    JSR     PC,INTLNE       ;INITIALIZE LINE (# IN CURLIN)
3132  013236  000525                            BR      6$              ;LINE FAILED TO INITIALIZE #=1
3133  013240  004737  031274                    JSR     PC,STCLK        ;SET MAINT LOOP + START CLOCK
3134  013244  000522                            BR      6$              ;MAINTENANCE COMMAND NOT ISSUED #=1
3135  013246  005237  002452                    INC     ERNUM
3136  013252  005037  002524                    CLR     BUFEA           ;NO EA BITS
3137  013256  013737  002532  002522            MOV     BADDR,BUFADR    ;BASE ADDRESS OF BUFFERS
3138  013264  013737  013526  002526            MOV     8$,BUFCNT       ;LOAD THE LENGTH
3139  013272  004737  031344                    JSR     PC,RIN          ;LOAD A RECEIVE BUFFER IN
3140  013276  000505                            BR      6$              ;RECEIVE BUFFER FAILED TO LOAD #=2
3141  013300  005237  002452                    INC     ERNUM
3142  013304  004737  031354                    JSR     PC,XIN          ;LOAD A TRANSMIT BUFFER IN
3143  013310  000500                            BR      6$              ;TRANSMIT BUFFER FAILED TO LOAD #=3
3144                                            ;WATCHDOG THE COMPLETION OF THE TRANSFER
3145  013312  005237  002452                    INC     ERNUM
3146  013316  005037  013524                    CLR     7$
3147  013322  005037  013530                    CLR     20$             ;CLEAR RECEIVE BUFFER COUNT
3148  013326  005037  013532                    CLR     21$             ;CLEAR TOTAL BUFFER COUNT
3149  013332  005037  002462                    CLR     SHBE
3150  013336                          2$:
3151  013336  004737  031742                    JSR     PC,REQOUT       ;TEST REQUEST OUT OF KMC SETS
3152  013342  000401                            BR      3$
3153  013344  000404                            BR      4$              ;A REQUEST OUT IS SET
3154  013346  005337  013524          3$:       DEC     7$              ;COUNT DOWN THE LOOP
3155  013352  001371                            BNE     2$
3156  013354  000456                            BR      6$              ;B=NO BUFFER RETURNED FROM TRANSFER #=4,,7
3157  013356                          4$:       ;TEST THAT THE PROPER COMMAND IS RETURNED
3158  013356  005237  002452                    INC     ERNUM
3159  013362  122777  000200  166674            CMPB    #200,@SEL2      ;TRANSMIT BUFFER?
```

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3160  013370  001001                        BNE     12$             ;B=N
3161  013372  000406                        BR      14$
3162  013374  122777  000204  166662  12$:  CMPB    #204,@SEL2      ;RECEIVE BUFFER?
3163  013402  001043                        BNE     6$              ;B=N COMMAND RETURNED WAS NOT BUFFER OUT #=5,10
3164  013404  005237  013530                INC     20$             ;COUNT RECEIVE BUFFER
3165  013410  005237  013532          14$:  INC     21$             :COUNT ALL BUFFERS
3166  013414  005237  002452                INC     ERNUM
3167  013420  010137  002462                MOV     R1,SHBE
3168  013424  020177  166640                CMP     R1,@SEL4        ;CORRECT RETURNED ADDRESS?
3169  013430  001030                        BNE     6$              ;B=NO ERR #=6,11 (SHBE=ADDRESS)
3170  013432  105077  166626                CLRB    @SEL2           ;COMMAND DONE
3171  013436  005237  002452                INC     ERNUM
3172  013442  005037  002462                CLR     SHBE
3173  013446  023727  013532  000002        CMP     21$,#2          ;HAVE TWO BUFFERS RETURNED?
3174  013454  002730                        BLT     2$              ;B=N TO WAIT FOR NEXT
3175  013456  013737  013530  002462        MOV     20$,SHBE
3176  013464  022737  000001  013530        CMP     #1,20$          ;ONE OF TWO IS RECEIVE?
3177  013472  001004                        BNE     16$             ;B=N 1XMIT & 1REC NOT RETURNED #=12
3178  013474  004737  031650                JSR     PC,GETLIN       ;GET THE NEXT LINE NUMBER
3179  013500                          5$:
3180  013500  000415                        BR      TST27           ;;DONE
3181  013502  000606                        BR      1$              ;DO NEXT LINE
3182
3183  013504  012737  000012  002452  16$:  MOV     #12,ERNUM       ;ERROR # 12
3184  013512                          6$:
3185  013512  004737  031470                JSR     PC,GETCSR       ;GET CONTENTS OF THE CSRS
3186  013516  104026                        ERROR+  26
3187  013520  000137  013120                JMP     1$
3188  013524  000000                  7$:   0                       ;WATCH LOOP COUNTER
3189  013526  000000                  8$:   0
3190  013530  000000                  20$:  0                       ;COUNT OF RECEIVE BUFFERS
3191  013532  000000                  21$:  0                       ;TOTAL BUFFER COUNT
3192
3193
3194                                  ;;*****************************************************************
3195                                          ;BSEADR
3196                                          ;THIS TEST WILL CHECK THE LOWER 13 (4K) BIT TRANSMIT AND RECEIVE
3197                                          ;BUFFER ADDRESSING (BUFFER ADDRESS-IN AND OUT) BY TRANSMITTING
3198                                          ;AND RECEIVING TWO WORD BUFFERS. THE ADDRESSES ARE SEQUENCED BY
3199                                          ;WALKING A ONE ACROSS THE RETURNED BUFFER ADDRESS VALUE.
3200                                          ;THE RETURNED BUFFER ADDRESSES ARE TESTED FOR BEING CORRECT.
3201                                  ;;*****************************************************************
3202
3203                                          ;TEST   27
3204                                  ;;*****************************************************************
3205  013534  000004                  TST27:  SCOPE
3206  013536  012737  000027  002460          MOV     #27,TSTNUM      ;LOAD THE WD OF THIS TEST
3207  013544  004737  030244                  JSR     PC,SETLIN       ;SETUP THE FIRST LINE
3208  013550  012737  013762  001110          MOV     #2$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
3209  013556  022737  020000  002534          CMP     #20000,CCTST    ;NEED 8K OVER DIAGNOSTIC TO RUN TEST
3210  013564  003402                          BLE     14$             ;SKIP IF ENOUGH CORE
3211  013566  000137  014370                  JMP     13$             ;OTHERWISE CONTINUE TO NEXT TEST
3212  013572  013701  002532          14$:    MOV     BADDR,R1        ;FIND LAST ADDRESS OF BUFFER
3213  013576  063701  002534                  ADD     CCTST,R1
3214  013602  010137  014410                  MOV     R1,5$           ;HIGHEST ADDRESS
3215  013606  012704  000004                  MOV     #4,R4           ;INITIALIZE ADDRESS
```

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3216                                            ;INITIALIZE THE BASE ADDRESSES
3217  013612  013702  002532          15$:     MOV     BADDR,R2
3218  013616  060402                           ADD     R4,R2
3219  013620  020237  014410                   CMP     R2,5$           ;DONE?
3220  013624  101402                           BLOS    10$             ;SKIP OVER IF NO
3221  013626  000137  014364                   JMP     3$              ;OTHERWISE CONT. TO NEXT LINE
3222  013632  010237  002472          10$:     MOV     R2,XRET
3223  013636  010237  002474                   MOV     R2,RRET
3224  013642  005742                           TST     -(R2)           ;-2
3225  013644  005742                           TST     -(R2)           ;-2
3226  013646  105737  002311                   TSTB    MODE
3227  013652  100002                           BPL     6$              ;IN CCP THIS IS CHAR. COUNT
3228  013654  005742                           TST     -(R2)           ;-2 IN BOP THIS IS WORD COUNT
3229  013656  005742                           TST     -(R2)           ;-2
3230  013660  010237  002466          6$:      MOV     R2,XOUT
3231  013664  010237  002470                   MOV     R2,ROUT
3232  013670  005037  002530                   CLR     RBUFSZ          ;BUFFER SIZE FLAG
3233  013674  105737  002316                   TSTB    CLKDAT          ;INTERNAL?
3234  013700  100414                           BMI     65$             ;B=YES
3235  013702  105737  002314                   TSTB    CRC32F          ;IF CRC32 IS ENABLED ADD 4 MORE CHARS.
3236  013706  100011                           BPL     65$             ;B=NOT ENABLED
3237  013710  012737  177777  002530          MOV     #-1,RBUFSZ      ;SET FLAG FOR REC.BUFF HANDLING
3238  013716  062737  000006  002474          ADD     #6,RRET         ;UP REC BUFFER BY 4 CHARS.
3239  013724  062737  000002  002470          ADD     #2,ROUT         ;ADD 4 CHARS. FOR CRC32
3240  013732  012701  000004          65$:     MOV     #4,R1           ;FILL BUFFER WITH ALLOWED
3241  013736  004737  032542                   JSR     PC,MEMFIL       ;INCREMENTING PATTERN
3242  013742  005037  002524                   CLR     BUFEA
3243  013746  012737  010004  002526          MOV     #10004,BUFCNT   ;SIZE OF BUFFERS
3244  013754  043737  002330  002526          BIC     MODMSK,BUFCNT
3245  013762  012737  000001  002452  2$:      MOV     #1,ERNUM
3246  013770  005037  002462                   CLR     SHBE
3247  013774  005037  002464                   CLR     WAS
3248  014000  004737  030664                   JSR     PC,INTKMC       ;INITIALIZE KMC-11 FIRMWARE
3249  014004  000574                           BR      4$              ;FIRMWARE FAILED TO INITIALIZE #=1
3250  014006  004737  031204                   JSR     PC,INTLNE       ;INITIALIZE LINE (# IN CURLIN)
3251  014012  000571                           BR      4$              ;LINE FAILED TO INITIALIZE #=1
3252  014014  004737  031274                   JSR     PC,STCLK        ;SET MAINT LOOP + START CLOCK
3253  014020  000566                           BR      4$              ;MAINTENANCE COMMAND NOT ISSUED #=1
3254  014022  004737  031714                   JSR     PC,SYNTIM       ;ALLOW TIME FOR SYNC DET.
3255                                            ;QUEUE THE BUFFERS
3256  014026  005237  002452                   INC     ERNUM
3257  014032  005737  002530                   TST     RBUFSZ          ;BOP/W CRC32
3258  014036  100003                           BPL     46$             ;B=NO
3259  014040  062737  000002  002526          ADD     #2,BUFCNT
3260  014046  013737  002470  002522  46$:     MOV     ROUT,BUFADR
3261  014054  004737  031344                   JSR     PC,RIN          ;LOAD A RECEIVE BUFFER IN
3262  014060  000546                           BR      4$              ;RECEIVE BUFFER FAILED TO LOAD #2
3263  014062  005237  002452                   INC     ERNUM
3264  014066  005737  002530                   TST     RBUFSZ          ;BOP/W CRC32?
3265  014072  100003                           BPL     56$             ;B=NO
3266  014074  162737  000002  002526          SUB     #2,BUFCNT
3267  014102  013737  002466  002522  56$:     MOV     XOUT,BUFADR
3268  014110  004737  031354                   JSR     PC,XIN          ;LOAD A TRANSMIT BUFFER IN
3269  014114  000530                           BR      4$              ;TRANSMIT BUFFER FAILED TO LOAD #=3
3270  014116  005237  002452                   INC     ERNUM
3271  014122  005037  014412                   CLR     20$             ;CLEAR RX BUFFER COUNT
```

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3272  014126  005037  014414          CLR     21$             ;CLEAR TOTAL BUFFER COUNT
3273  014132                  16$:
3274  014132  004737  031742          JSR     PC,REQOUT       ;TEST REQUEST OUT OF KMC SETS
3275  014136  000517                  BR      4$              ;NO BUFFER RETURNED #=4,7
3276  014140  005237  002452          INC     ERNUM
3277  014144  012737  000200  002462  MOV     #200,SHBE       ;EXPECT TRANSMIT BUFFER OUT
3278  014152  123777  002462  166104  CMPB    SHBE,@SEL2
3279  014160  001015                  BNE     30$             ;IF NOT, CHECK IF RX BUFFER OUT
3280  014162  005237  002452          INC     ERNUM
3281  014166  013737  002472  002462  MOV     XRET,SHBE
3282  014174  017737  166070  002464  MOV     @SEL4,WAS
3283  014202  023737  002462  002464  CMP     SHBE,WAS        ;IS ADDRESS RETURNED CORRECT?
3284  014210  001072                  BNE     4$              ;B=NO ERR #=6,11
3285  014212  000425                  BR      31$             ;CONTINUE TO COMMON CODE
3286
3287  014214  012737  000204  002462  30$:    MOV     #204,SHBE       ;EXPECT RECEIVE BUFFER OUT
3288  014222  123777  002462  166034          CMPB    SHBE,@SEL2
3289  014230  001062                  BNE     4$              ;IF NEITHER RX NOR TX BUFFER, ERROR #=5,10
3290  014232  005237  014412          INC     20$             ;COUNT RETURNED RX BUFFERS
3291  014236  005237  002452          INC     ERNUM
3292  014242  013737  002474  002462  MOV     RRET,SHBE
3293  014250  017737  166014  002464  MOV     @SEL4,WAS
3294  014256  023737  002462  002464  CMP     SHBE,WAS        ;CORRECT RETURNED ADDRESS?
3295  014264  001044                  BNE     4$              ;B=NO ERR #=6,11
3296  014266  005237  002452  31$:    INC     ERNUM
3297  014272  005237  014414          INC     21$             ;COUNT ALL BUFFERS
3298  014276  005077  165762          CLR     @SEL2           ;DISMISS COMMAND
3299  014302  023727  014414  000002  CMP     21$,#2          ;HAVE TWO COMMANDS BEEN RETURNED?
3300  014310  002710                  BLT     16$             ;B=NO TO WAIT FOR NEXT
3301  014312  012737  014412  002462  MOV     #20$,SHBE       ;SET RX BUFFER COUNT FOR OUTPUT
3302  014320  023727  014412  000001  CMP     20$,#1          ;ARE RETURNED BUFFERS 1 TX AND 1 RX?
3303  014326  001023                  BNE     4$              ;B=NO, #=12
3304  014330  005237  002452          INC     ERNUM
3305  014334  005037  002462          CLR     SHBE
3306  014340  004737  031742          JSR     PC,REQOUT       ;TEST REQUEST OUT OF KMC SETS
3307  014344  000401                  BR      7$              ;NO RESPONSE IS CORRECT
3308  014346  000413                  BR      4$              ;EXTRA COMMAND IS ERROR, #=13
3309  014350  006304          7$:     ASL     R4              ;TEST FOR NEXT WALKING VALUE
3310  014352  022704  020000          CMP     #20000,R4       ;DONE?
3311  014356  002402                  BLT     3$              ;IF YES,CONTINUE TO NEXT LINE
3312  014360  000137  013612          JMP     15$             ;OTHERWISE REPEAT TEST WITH NEXT ADDRESS
3313  014364                  3$:
3314  014364  004737  031650          JSR     PC,GETLIN       ;GET THE NEXT LINE NUMBER
3315  014370                  13$:
3316  014370  000412                  BR      TST30           ;;BR IF DONE OR TEST CAN NOT BE RUN
3317  014372  000137  013572          JMP     14$             ;DO NEXT LINE
3318
3319                          ;REPORT ERROR
3320  014376  004737  031470  4$:     JSR     PC,GETCSR
3321  014402  104027                  ERROR+  27
3322  014404  000137  013762          JMP     2$
3323  014410  000000          5$:     0               ;HOLD THE HIGHEST ADDRESS THAT CAN BE TESTED
3324  014412  000000          20$:    0               ;RX BUFFER COUNT
3325  014414  000000          21$:    0               ;TOTAL BUFFER COUNT
3326
3327                          ;;*****************************************************************
```

```
                                        ;DATADR
                                        ;THIS TEST WILL CHECK BUSS ADDRESSING OF THE HIGHER ORDER
                                        ;BITS (BITS 14-17) OF THE QUEUED RECEIVE BUFFER AND MULTIPLE DATA
                                        ;TRANSFERS BY TRANSFERING A 10 WORD BUFFER TO EACH 4K BOUNDARY
                                        ;(IN THE TEST RANGE) OUTPUT IS FROM "TBUF"
                                        ;* THE TEST WILL EXECUTE ONLY IF SUFFICIENT CORE EXIST.
                                ;;**************************************************************

                                        ;TEST   30
                                ;;**************************************************************
014416  000004                  TST30:  SCOPE
014420  012737  000030  002460          MOV     #30,TSTNUM      ;LOAD THE WD OF THIS TEST
014426  004737  030244                  JSR     PC,SETLIN       ;SETUP THE FIRST LINE
014432  012737  014464  001110          MOV     #1$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
                                        ;CAN TEST BE RUN?
014440  005737  002534                  TST     CCTST
014444  001422                          BEQ     2$              ;B=NO
014446  005037  002524                  CLR     BUFEA
014452  005037  002476                  CLR     CUREA
014456  013737  002532  002500          MOV     BADDR,CURBUF
014464  012737  000001  002452  1$:     MOV     #1,ERNUM
014472  005037  002464                  CLR     WAS
014476  005037  002462                  CLR     SHBE
                                        ;MAP TO THE CURRENT BUFFER UNDER TEST (ENABLE KT11 IF PRESENT)
014502  004737  032030                  JSR     PC,MAPBFR       ;MAP BUFFER FOR RECEIVE
014506  000401                          BR      2$              ;B=NO
014510  000404                          BR      17$             ;YES
014512  000137  015160          2$:     JMP     77$             ;SKIP TO NEXT TEST HELPER
014516  000137  015152          16$:    JMP     6$              ;ERROR BRANCH HELPER
014522                          17$:
014522  004737  030664                  JSR     PC,INTKMC       ;INITIALIZE KMC-11 FIRMWARE
014526  000773                          BR      16$             ;FIRMWARE FAILED TO INITIALIZE #=1
014530  004737  031204                  JSR     PC,INTLNE       ;INITIALIZE LINE (# IN CURLIN)
014534  000770                          BR      16$             ;LINE FAILED TO INITIALIZE #=1
014536  004737  031274                  JSR     PC,STCLK        ;SET MAINT LOOP + START CLOCK
014542  000765                          BR      16$             ;MAINTENANCE COMMAND NOT ISSUED #=1
014544  005237  002452                  INC     ERNUM
014550  004737  032456                  JSR     PC,INTREC       ;INITIALIZE THE REC. BUFFER
014554  012737  010012  002526          MOV     #10012,BUFCNT   ;SET BUFFER LENGTH
014562  043737  002330  002526          BIC     MODMSK,BUFCNT
014570  004737  031344                  JSR     PC,RIN          ;LOAD A RECEIVE BUFFER IN
014574  000750                          BR      16$             ;BUFFER FAILED LOAD (REC.) #=2
014576  005237  002452                  INC     ERNUM
014602  012737  052260  002522          MOV     #TBUF,BUFADR
014610  005037  002524                  CLR     BUFEA
014614  012737  010010  002526          MOV     #10010,BUFCNT           ;SET BUFFER LENGTH
014622  043737  002330  002526          BIC     MODMSK,BUFCNT
014630  004737  031354                  JSR     PC,XIN          ;LOAD A TRANSMIT BUFFER IN
014634  000730                          BR      16$             ;BUFFER FAILED TO LOAD (TRANSMIT) #=3
014636  005237  002452                  INC     ERNUM
                                        ;WATCHDOG THE TRANSFERS COMPLETION
014642  005037  015162                  CLR     20$             ;RECEIVE BUFFER COUNT
014646  005037  015164                  CLR     21$             ;TOTAL BUFFER COUNT
014652  012737  000004  002452  18$:     MOV     #4,ERNUM
014660  012700  000002                  MOV     #2,R0           ;SET UP WAIT LOOP
014664                          3$:
```

```
3384  014664  004737  031742          JSR     PC,REQOUT       ;TEST REQUEST OUT OF KMC SETS
3385  014670  000401                  BR      4$
3386  014672  000403                  BR      5$              ;OK OUTPUT REQUESTED
3387  014674  005300            4$:   DEC     R0
3388  014676  001372                  BNE     3$
3389  014700  000524                  BR      6$              ;ERR #=4 TRANSFER FAILED TO COMPLETE
3390  014702  005237  002452    5$:   INC     ERNUM
3391                                  ;TEST FOR RETURNED BUFFER
3392  014706  005037  002462          CLR     SHBE            ;RETURNED EA BITS SHOULD BE=0
3393  014712  122777  000200  165344  CMPB    #200,@SEL2      ;CHECK FOR TRANSMIT BUFFER
3394  014720  001015                  BNE     10$
3395  014722  012737  000006  002452  MOV     #6,ERNUM        ;SET UP TRANSMIT BUFFER ERROR #'S
3396  014730  012737  052270  002514  MOV     #TBUF+10,RETBUF ;RETURNED BUFFER ADDRESS SHOULD BE
3397  014736  105737  002311          TSTB    MODE            ;CHECK MODE
3398  014742  100003                  BPL     8$              ;SKIP IF CCP
3399  014744  062737  000010  002514  ADD     #10,RETBUF      ;IN BOP,CONVERT WORD COUNT TO BYTES
3400  014752                    8$:
3401  014752  000417                  BR      12$
3402  014754  122777  000204  165302  10$:   CMPB    #204,@SEL2      ;CHECK FOR RECEIVE BUFFER
3403  014762  001073                  BNE     6$              ;B=N COMMAND NOT TX OR RX BUFFER OUT #=5
3404  014764  005237  015162          INC     20$             ;COUNT RECEIVE BUFFER
3405  014770  012737  000010  002452  MOV     #10,ERNUM       ;SET UP RECEIVE BUFFER ERROR #'S
3406  014776  013737  002510  002462  MOV     RETEA,SHBE      ;CURRENTLY MAPPED BUFFER EA-BITS
3407  015004  013737  002512  002514  MOV     RETADR,RETBUF
3408  015012  005237  015164    12$·  INC     21$             ;COUNT ALL BUFFERS
3409  015016  017737  165252  002464  MOV     @SEL6,WAS       ;GET EA BITS
3410  015024  042737  037777  002464  BIC     #37777,WAS      ;SAVE ONLY THE EA-BITS
3411  015032  023737  002462  002464  CMP     SHBE,WAS        ;ARE EA BITS CORRECT?
3412  015040  001044                  BNE     6$              ;B=NO ERR #=6,10
3413  015042  005237  002452          INC     ERNUM           ;TEST LOWER 16 BIT ADDRESS
3414  015046  017737  165216  002464  MOV     @SEL4,WAS       ;16 BIT ADDRESS
3415  015054  013737  002514  002462  MOV     RETBUF,SHBE
3416  015062  023737  002462  002464  CMP     SHBE,WAS        ;16 BIT RECEIVE BUFFER ADDRESS CORRECT?
3417  015070  001030                  BNE     6$              ;NO ERR #=7,11
3418  015072  005237  002452          INC     ERNUM
3419  015076  105077  165162          CLRB    @SEL2           ;DISMISS COMMAND
3420  015102  023727  015164  000002  CMP     21$,#2          ;TWO COMMANDS BACK YET
3421  015110  002660                  BLT     18$             ;B=NO WAIT FOR ANOTHER
3422  015112  013737  015162  002462  MOV     20$,SHBE        ;STORE # OF RECEIVE BUFFERS
3423  015120  023727  015162  000001  CMP     20$,#1          ;1 RECEIVE BUFFER?
3424  015126  001011                  BNE     6$              ;B=NO TWO BUFFERS NOT 1 TX & 1 RX #=12
3425                                  ;GO + DO NEXT BUFFER
3426  015130  000241                  CLC
3427  015132  062737  020000  002500  ADD     #20000,CURBUF   ;4K TO NEXT BUFFER
3428  015140  103002                  BCC     55$             ;OVERFLOW?
3429  015142  005237  002476          INC     CUREA           ;YES +1 TO EA BITS
3430  015146  000137  014464    55$:  JMP     1$              ;RUN IT
3431
3432                                  ;REPORT ERROR
3433  015152                    6$:
3434  015152  104030                  ERROR+  30
3435  015154  000137  014464          JMP     1$
3436
3437  015160                    77$:
3438  015160  000402                  BR      TST31           ;;GO TO NEXT TEST
3439  015162  000000            20$:  0               ;RECEIVE BUFFER COUNT
```

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3440  015164  000000                  21$:    0                       ;TOTAL BUFFER COUNT
3441
3442                                  ;;*****************************************************************
3443                                          ;DATADR
3444                                          ;THIS TEST WILL CHECK BUSS ADDRESSING OF THE HIGHER ORDER BITS
3445                                          ;(BITS 14-17) OF THE QUEUED TRANSMIT BUFFER AND MULTIPLE DATA
3446                                          ;TRANSFERS BY TRANSFERRING A 10 WORD BUFFER FROM EACH 4K BOUNDARY
3447                                          ;(IN THE TEST RANGE) INPUT IS TO RBUF.
3448                                          ;* THE TEST WILL EXECUTE ONLY IF SUFFICIENT CORE EXIST.
3449                                  ;;*****************************************************************
3450
3451                                          ;TEST   31
3452                                  ;;*****************************************************************
3453  015166  000004                  TST31:  SCOPE
3454  015170  012737  000031  002460          MOV     #31,TSTNUM      ;LOAD THE WD OF THIS TEST
3455  015176  004737  030244                  JSR     PC,SETLIN       ;SETUP THE FIRST LINE
3456  015202  012737  015234  001110          MOV     #1$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
3457                                          ;CAN TEST BE RUN?
3458  015210  005737  002534                  TST     CCTST
3459  015214  001422                          BEQ     2$              ;B=NO
3460  015216  005037  002524                  CLR     BUFEA
3461  015222  005037  002476                  CLR     CUREA
3462  015226  013737  002532  002500          MOV     BADDR,CURBUF
3463  015234  012737  000001  002452  1$:     MOV     #1,ERNUM
3464  015242  005037  002464                  CLR     WAS
3465  015246  005037  002462                  CLR     SHBE
3466                                          ;MAP TO THE CURRENT BUFFER UNDER TEST (ENABLE KT11 IF PRESENT)
3467  015252  004737  032036                  JSR     PC,MAPBUF       ;MAP BUFFER FOR TRANSMIT
3468  015256  000401                          BR      2$              ;B=NO
3469  015260  000404                          BR      17$             ;YES
3470  015262  000137  015776          2$:     JMP     77$             ;SKIP TO NEXT TEST HELPER
3471  015266  000137  015770          16$:    JMP     6$              ;ERROR BRANCH HELPER
3472  015272                          17$:
3473  015272  004737  030664                  JSR     PC,INTKMC       ;INITIALIZE KMC-11 FIRMWARE
3474  015276  000773                          BR      16$             ;FIRMWARE FAILED TO INITIALIZE #=1
3475  015300  004737  031204                  JSR     PC,INTLNE       ;INITIALIZE LINE (# IN CURLIN)
3476  015304  000770                          BR      16$             ;LINE FAILED TO INITIALIZE #=1
3477  015306  004737  031274                  JSR     PC,STCLK        ;SET MAINT LOOP + START CLOCK
3478  015312  000765                          BR      16$             ;MAINTENANCE COMMAND NOT ISSUED #=1
3479  015314  005237  002452                  INC     ERNUM
3480  015320  004737  032510                  JSR     PC,INTTRM       ;INITIALIZE THE TRANSMIT BUFFER
3481  015324  012737  010012  002526          MOV     #10012,BUFCNT   ;SET BUFFER LENGTH
3482  015332  043737  002330  002526          BIC     MODMSK,BUFCNT
3483  015340  013700  002522                  MOV     BUFADR,R0       ;LOAD THE RECEIVE BUFFER FIRST
3484  015344  013701  002524                  MOV     BUFEA,R1
3485  015350  012737  052660  002522          MOV     #RBUF,BUFADR
3486  015356  005037  002524                  CLR     BUFEA
3487  015362  004737  031344                  JSR     PC,RIN          ;LOAD A RECEIVE BUFFER IN
3488  015366  000737                          BR      16$             ;RECEIVE BUFFER FAILED TO LOAD ERR #=2
3489  015370  005237  002452                  INC     ERNUM
3490  015374  010137  002524                  MOV     R1,BUFEA        ;RESTORE EA-BITS
3491  015400  010037  002522                  MOV     R0,BUFADR
3492  015404  012737  010010  002526          MOV     #10010,BUFCNT   ;SET BUFFER LENGTH
3493  015412  043737  002330  002526          BIC     MODMSK,BUFCNT
3494  015420  004737  031354                  JSR     PC,XIN          ;LOAD A TRANSMIT BUFFER IN
3495  015424  000561                          BR      6$              ;TRANSMIT BUFFER FAILED TO LOAD #=3
```

```
3496  015426  005237  002452                  INC     ERNUM
3497                                          ;WATCHDOG THE TRANSFERS COMPLETION
3498  015432  005037  016000                  CLR     20$             ;RECEIVE BUFFER COUNT
3499  015436  005037  016002                  CLR     21$             ;TOTAL BUFFER COUNT
3500  015442  012737  000004  002452  18$:    MOV     #4,ERNUM
3501  015450  012700  000002                  MOV     #2,R0           ;SET UP WAIT LOOP
3502  015454                        3$:
3503  015454  004737  031742                  JSR     PC,REQOUT       ;TEST REQUEST OUT OF KMC SETS
3504  015460  000401                          BR      4$
3505  015462  000403                          BR      5$              ;OK OUTPUT REQUESTED
3506  015464  005300                4$:       DEC     R0
3507  015466  001372                          BNE     3$
3508  015470  000537                          BR      6$              ;ERR #=4 TRANSFER FAILED TO COMPLETE
3509  015472  005237  002452        5$:       INC     ERNUM
3510                                          ;TEST FOR RETURNED BUFFER
3511  015476  005037  002462                  CLR     SHBE            ;RETURNED EA BITS SHOULD BE=0
3512  015502  122777  000200  164554          CMPB    #200,@SEL2      ;CHECK FOR TRANSMIT BUFFER
3513  015510  001012                          BNE     10$
3514  015512  012737  000006  002452          MOV     #6,ERNUM        ;SET UP TRANSMIT BUFFER ERROR #'S
3515  015520  013737  002510  002462          MOV     RETEA,SHBE      ;CURRENTLY MAPPED BUFFER
3516  015526  013737  002512  002514          MOV     RETADR,RETBUF
3517  015534  000435                          BR      12$
3518  015536  122777  000204  164520  10$:    CMPB    #204,@SEL2      ;CHECK FOR RECEIVE BUFFER
3519  015544  001111                          BNE     6$              ;B=N COMMAND NOT TX OR RX BUFFER OUT #=5
3520  015546  005237  016000                  INC     20$             ;COUNT RECEIVE BUFFER
3521  015552  012737  000010  002452          MOV     #10,ERNUM       ;SET UP RECEIVE BUFFER ERROR #'S
3522  015560  005037  002462                  CLR     SHBE
3523  015564  012737  052670  002514          MOV     #RBUF+10,RETBUF ;RETURNED RECEIVE BUFFER SHOULD BE
3524  015572  105737  002311                  TSTB    MODE            ;CHECK MODE
3525  015576  100014                          BPL     9$              ;SKIP IF CCP
3526  015600  062737  000010  002514          ADD     #10,RETBUF      ;IN BOP, CONVERT WORD COUNT TO BYTES
3527  015606  105737  002316                  TSTB    CLKDAT          ;CHECK INTERNAL OR EXTERNAL
3528  015612  100406                          BMI     9$
3529  015614  105737  002314                  TSTB    CRC32F          ;ONLY IF EXT.,CHECK IF CRC32 USED
3530  015620  100003                          BPL     9$
3531  015622  062737  000004  002514          ADD     #4,RETBUF       ;IF CRC32, ADD BYTES FOR APPENDED CRC
3532  015630                        9$:
3533  015630  005237  016002        12$:      INC     21$             ;COUNT ALL BUFFERS
3534  015634  017737  164434  002464          MOV     @SEL6,WAS       ;GET EA BITS
3535  015642  042737  037777  002464          BIC     #37777,WAS      ;SAVE ONLY THE EA-BITS
3536  015650  023737  002462  002464          CMP     SHBE,WAS        ;ARE EA BITS CORRECT?
3537  015656  001044                          BNE     6$              ;B=NO ERR #=6,10
3538  015660  005237  002452                  INC     ERNUM           ;TEST LOWER 16 BIT ADDRESS
3539  015664  017737  164400  002464          MOV     @SEL4,WAS       ;16 BIT ADDRESS
3540  015672  013737  002514  002462          MOV     RETBUF,SHBE
3541  015700  023737  002462  002464          CMP     SHBE,WAS        ;16 BIT RECEIVE BUFFER ADDRESS CORRECT?
3542  015706  001030                          BNE     6$              ;NO ERR #=7,11
3543  015710  005237  002452                  INC     ERNUM
3544  015714  105077  164344                  CLRB    @SEL2           ;DISMISS COMMAND
3545  015720  023727  016002  000002          CMP     21$,#2          ;TWO COMMANDS BACK YET
3546  015726  002645                          BLT     18$             ;B=NO WAIT FOR ANOTHER
3547  015730  013737  016000  002462          MOV     20$,SHBE        ;STORE # OF RECEIVE BUFFERS
3548  015736  023727  016000  000001          CMP     20$,#1          ;1 RECEIVE BUFFER?
3549  015744  001011                          BNE     6$              ;B=NO TWO BUFFERS NOT 1 TX & 1 RX #=12
3550                                          ;GO + DO NEXT BUFFER
3551  015746  000241                          CLC
```

```
3552  015750  062737  020000  002500          ADD     #20000,CURBUF   ;4K TO NEXT BUFFER
3553  015756  103002                          BCC     55$             ;OVERFLOW?
3554  015760  005237  002476                  INC     CUREA           ;YES +1 TO EA BITS
3555  015764  000137  015234          55$:    JMP     1$              ;RUN IT
3556
3557                                          ;REPORT ERROR
3558  015770                          6$:
3559  015770  104031                          ERROR+  31
3560  015772  000137  015234                  JMP     1$
3561
3562  015776                          77$:
3563  016000  000402                          BR      TST32           ;;GO TO NEXT TEST
3564  016002  000000                  20$:    0               ;RECEIVE BUFFER COUNT
3565  016004  000000                  21$:    0               ;TOTAL BUFFER COUNT
3566
3567                                          ;;*****************************************************************
3568                                          ;DATTST
3569                                          ;THIS TEST WILL CHECK MULTIPLE DATA TRANSFERS AND BUS ADDRESSING
3570                                          ;BY TRANSFERRING BUFFERS TO EACH INCREMENTAL 4K ABOVE THE DIAGNOSTIC
3571                                          ;IN CCP MODE, THE FIRST 4K BLOCK (16-20K) IS WRITTEN WITH AN
3572                                          ;INCREMENTAL PATTERN (40-175) AND TRANSFERRED TO EACH 4K ABOVE
3573                                          ;THE DIAGNOSTIC (20K UP)
3574                                          ;IN BOP MODE, THE FIRST 1024 BYTES OF THE FIRST 4K BLOCK (16K) ARE
3575                                          ;WRITTEN WITH AN INCREMENTAL PATTERN (0-377) AND TRANSFERRED
3576                                          ;TO THE START OF EACH 4K ABOVE THE DIAGNOSTIC (20K UP)
3577                                          ;TEST WILL RUN ONLY IF 20K OR MORE OF CONTIGUOUS CORE (0 UP) EXISTS ON SYSTEM
3578
3579
3580                                          ;TEST   32
3581                                          ;;*****************************************************************
3582  016004  000004                  TST32:  SCOPE
3583  016006  012737  000032  002460          MOV     #32,TSTNUM      ;LOAD THE WD OF THIS TEST
3584  016014  004737  030244                  JSR     PC,SETLIN       ;SETUP THE FIRST LINE
3585  016020  012737  016036  001110          MOV     #1$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
3586                                          ;CAN TEST BE RUN?
3587  016026  022737  000020  002534          CMP     #20,CCTST       ;AT LEAST 4K OVER DIAG.
3588  016034  003041                          BGT     11$             ;B=N, SKIP TO NEXT TEST
3589                                          ;INITIALIZE THE RECEIVED BUFFER POINTER ADDRESS
3590  016036  013737  002532  002500  1$:     MOV     BADDR,CURBUF    ;START @ BASE ADDR.
3591  016044  062737  020000  002500          ADD     #20000,CURBUF   ;UP BY 4K
3592  016052  005037  002476                  CLR     CUREA           ;NO EA BITS
3593  016056  013702  002532                  MOV     BADDR,R2        ;FILL TRANSMIT BUFFER WITH INCREMENTAL PATTERN
3594  016062  012701  017777                  MOV     #17777,R1
3595  016066  004737  032542                  JSR     PC,MEMFIL
3596  016072  012737  000001  002452          MOV     #1,ERNUM
3597  016100  005037  002464          2$:     CLR     WAS
3598  016104  005037  002462                  CLR     SHBE
3599  016110  004737  030664                  JSR     PC,INTKMC       ;INITIALIZE KMC-11 FIRMWARE
3600  016114  000407                          BR      10$             ;F.W. NOT INITIALIZED #=1
3601  016116  004737  031204                  JSR     PC,INTLNE       ;INITIALIZE LINE (# IN CURLIN)
3602  016122  000404                          BR      10$             ;LINE FAILED TO INITIALIZE #=1
3603  016124  004737  031274                  JSR     PC,STCLK        ;SET MAINT LOOP + START CLOCK
3604  016130  000401                          BR      10$             ;MAINTENANCE COMMAND FAILED #=1
3605  016132  000406                          BR      20$
3606  016134  000137  017144          10$:    JMP     8$              ;BRANCH ERROR HELPER
3607  016140  000137  017126          11$:    JMP     12$             ;SKIP TO NEXT TEST HELPER
```

```
3608  016144  000137  017122          27$:    JMP     26$             ;GO TO NEXT LINE HELPER
3609  016150  005237  002452          20$:    INC     ERNUM
3610  016154  005037  002462                  CLR     SHBE
3611  016160  005037  002464                  CLR     WAS
3612                                          ;MAP THE RECEIVE BUFFER AND ENABLE KT11 (IF PRESENT)
3613                                          ;TO THE ADDRESS POINTED TO BY "CURBUF" AND "CUREA"
3614                                          ;IF THE RECEIVE BUFFER REQUEST EXCEEDS CORE LIMITS RETURN IS TO PC
3615  016164  004737  032036                  JSR     PC,MAPBUF       ;MAP THE RECEIVE BUFFER
3616  016170  000765                          BR      27$             ;CONTINUE TO NEXT LINE
3617  016172  013737  002524  017142          MOV     BUFEA,32$       ;SAVE HIGH ORDER BITS FOR LATER USE
3618  016200  012737  017777  002526          MOV     #17777,BUFCNT   ;LENGTH OF RECEIVE BUFFER
3619  016206  004737  031344                  JSR     PC,RIN          ;LOAD A RECEIVE BUFFER IN
3620  016212  000750                          BR      10$             ;B=BUFFER FAILED TO LOAD #=2
3621                                          ;LOAD THE TRANSMIT BUFFER
3622  016214  005237  002452                  INC     ERNUM
3623  016220  005037  002524                  CLR     BUFEA
3624  016224  013737  002532  002522          MOV     BADDR,BUFADR    ;TRANSMIT BUFFER ADDRESS
3625  016232  004737  031354                  JSR     PC,XIN          ;LOAD A TRANSMIT BUFFER IN
3626  016236  000736                          BR      10$             ;B=XBUFF FAILED TO LOAD #=3
3627  016240  005237  002452                  INC     ERNUM
3628                                          ;WATCH DOG THE I/O COMPLETION
3629  016244  005037  017136                  CLR     30$             ;CLEAR RECEIVE BUFFER COUNT
3630  016250  005037  017140                  CLR     31$             ;CLEAR TOTAL BUFFER COUNT
3631  016254  012737  017777  017134  22$:    MOV     #17777,7$       ;SPIN LOOP
3632  016262                          3$:
3633  016262  004737  031742                  JSR     PC,REQOUT       ;TEST REQUEST OUT OF KMC SETS
3634  016266  000401                          BR      4$
3635  016270  000404                          BR      5$              ;B=OUTPUT RESPONSE
3636  016272  005337  017134          4$:     DEC     7$
3637  016276  001371                          BNE     3$              ;TRY AGAIN
3638  016300  000477                          BR      13$             ;NO OUTPUT RESPONSE FROM FIRMWARE ERR #=4,11,17
3639  016302  005237  002452          5$:     INC     ERNUM           ;TEST THAT RESPONSE IS A RETURNED XMIT BUFFER
3640  016306  005037  002462                  CLR     SHBE
3641  016312  117737  163746  002464          MOVB    @SEL2,WAS
3642  016320  122737  000200  002464          CMPB    #200,WAS        ;IS COMMAND A TRANSMIT BUFFER?
3643  016326  001066                          BNE     23$             ;B=NO
3644  016330  012737  000006  002452          MOV     #6,ERNUM        ;INIT. ERROR COUNT FOR TX BUFFER
3645  016336  117737  163732  002464          MOVB    @SEL6,WAS
3646  016344  112737  000001  002462          MOVB    #1,SHBE
3647  016352  023737  002462  002464          CMP     SHBE,WAS        ;IS BUFFER STATUS = 1 (END COUNT REACHED)?
3648  016360  001047                          BNE     13$             ;B=N ERR #=6
3649  016362  005237  002452                  INC     ERNUM
3650  016366  017737  163676  002464          MOV     @SEL4,WAS       ;IS THE 16 BIT XMIT ADDRESS CORRECT?
3651  016374  012737  017777  002462          MOV     #17777,SHBE     ;SET UP 16-BIT TRANSMIT ADDRESS FOR CCP
3652  016402  105737  002311                  TSTB    MODE
3653  016406  100003                          BPL     33$             ;SKIP IF CCP
3654  016410  012737  001776  002462          MOV     #1776,SHBE      ;SET UP 16-BIT TRANSMIT ADDRESS FOR BOP
3655  016416  063737  002532  002462  33$:    ADD     BADDR,SHBE
3656  016424  023737  002462  002464          CMP     SHBE,WAS
3657  016432  001022                          BNE     13$             ;B=N ERR #=7
3658  016434  005237  002452                  INC     ERNUM
3659  016440  017737  163630  002464          MOV     @SEL6,WAS       ;ARE THE EA BITS CORRECT?
3660  016446  013737  002464  002462          MOV     WAS,SHBE
3661  016454  042737  140000  002462          BIC     #140000,SHBE    ;(THEY SHOULD BE CLEAR)
3662  016462  023737  002462  002464          CMP     SHBE,WAS
3663  016470  001003                          BNE     13$             ;B=N ERR #=10
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3664  016472  005237  002452              INC     ERNUM
3665  016476  000560                      BR      35$
3666  016500  000137  017144        13$:  JMP     8$              ;ERROR BRANCH HELPER
3667  016504  122737  000204  002464  23$:  CMPB    #204,WAS        ;IS COMMAND RECEIVE BUFFER OUT?
3668  016512  001372                      BNE     13$             ;B=OUTPUT NOT A RECEIVE BUFFER #=5,12,20
3669  016514  012737  000013  002452      MOV     #13,ERNUM       ;INIT. ERROR COUNT FOR RECEIVE BUFFER
3670  016522  012737  000002  002462      MOV     #2,SHBE         ;IS RETURNED STATUS AN END OF MESSAGE
3671  016530  005037  002464              CLR     WAS
3672  016534  105737  002314              TSTB    CRC32F          ;RUNNING CRC-32?
3673  016540  100003                      BPL     14$             ;B=NO
3674  016542  012737  000001  002462      MOV     #1,SHBE         ;SET REC. BUFFER STATUS TO ENDING MEM.AR.
3675  016550  117737  163520  002464  14$:  MOVB    @SEL6,WAS
3676  016556  123737  002462  002464      CMPB    SHBE,WAS
3677  016564  001167                      BNE     8$              ;B=NO #=13
3678  016566  005237  002452              INC     ERNUM
3679  016572  012737  017777  002462      MOV     #17777,SHBE     ;SET CCP ENDING BUFFER ADDRESS
3680  016600  105737  002311              TSTB    MODE
3681  016604  100003                      BPL     24$
3682  016606  012737  001776  002462      MOV     #1776,SHBE      ;SET BOP ENDING BUFFER ADDRESS
3683  016614  063737  002500  002462  24$:  ADD     CURBUF,SHBE
3684  016622  017737  163442  002464      MOV     @SEL4,WAS
3685  016630  023737  002462  002464      CMP     SHBE,WAS
3686  016636  001142                      BNE     8$              ;B=N #=14
3687  016640  005237  002452              INC     ERNUM
3688  016644  013737  017142  002462      MOV     32$,SHBE        ;ARE THE RETURNED REC.BUF EA BITS CORRECT?
3689  016652  017737  163416  002464      MOV     @SEL6,WAS
3690  016660  042737  037777  002464      BIC     #37777,WAS
3691  016666  023737  002462  002464      CMP     SHBE,WAS
3692  016674  001123                      BNE     8$              ;B=N #=15
3693  016676  005237  002452              INC     ERNUM
3694                                      ;TEST THE DATA RETURNED IN THE RECEIVE BUFFER
3695  016702  013701  002532              MOV     BADDR,R1        ;SET TO START OF TX BUFFER
3696  016706  013702  002502              MOV     MAPADR,R2       ;SET TO START OF RX BUFFER
3697  016712  005037  002464              CLR     WAS
3698  016716  005037  002462              CLR     SHBE
3699  016722  105737  002311              TSTB    MODE
3700  016726  100015                      BPL     25$
3701                                                              ;FOR BOP MODE ONLY
3702  016730  012700  001775              MOV     #1775,R0        ;  SET BOP CHARACTER COUNT
3703  016734  112137  002462        40$:  MOVB    (R1)+,SHBE      ;  GET PROPER CHARACTER
3704  016740  112237  002464              MOVB    (R2)+,WAS       ;  GET RECEIVED CHAR
3705  016744  123737  002462  002464      CMPB    SHBE,WAS        ;  AGREE?
3706  016752  001074                      BNE     8$              ;  BRANCH ON NO TO ERROR #=16
3707  016754  005300                      DEC     R0              ;  ARE WE DONE?
3708  016756  001366                      BNE     40$             ;  ON NO GO DO NEXT CHAR
3709  016760  000425                      BR      43$             ;  WHEN COMPARE DONE CONTINUE WITH COMMON CODE
3710                                                              ;FOR CCP MODE ONLY
3711  016762  012700  017777        25$:  MOV     #17777,R0       ;  SET CCP CHARACTER COUNT
3712  016766  112137  002462              MOVB    (R1)+,SHBE      ;  GET STARTING SOH
3713  016772  042737  000200  002462      BIC     #200,SHBE       ;  STRIP OFF PARITY BIT
3714  017000  000402                      BR      41$
3715  017002  112137  002462        42$:  MOVB    (R1)+,SHBE      ;  GET PROPER CHARACTER
3716  017006  112237  002464        41$:  MOVB    (R2)+,WAS       ;  GET RECEIVED CHARACTER
3717  017012  042737  000200  002464      BIC     #200,WAS        ;  STRIP OFF ADDED PARITY BIT
3718  017020  123737  002462  002464      CMPB    SHBE,WAS        ;  AGREE?
3719  017026  001046                      BNE     8$              ;  ON NO, BRANCH TO ERROR #=16
```

```
3720  017030  005300                    DEC     R0              ;  ARE WE DONE?
3721  017032  001363                    BNE     42$             ;  ON NO, GO DO NEXT CHAR
3722                                                            ;  FALL THROUGH TO COMMON CODE
3723  017034  005237  017136    43$:    INC     30$             ;COUNT RECEIVE BUFFERS
3724
3725                                    ;CHECK IF BOTH BUFFERS BACK YET
3726  017040  005237  017140    35$:    INC     31$             ;COUNT ALL BUFFERS
3727  017044  105077  163214            CLRB    @SEL2           ;DISMISS COMMAND
3728  017050  023727  017140  000002    CMP     31$,#2          ;TWO COMMANDS BACK YET?
3729  017056  001402                    BEQ     36$             ;B=YES
3730  017060  000137  016254            JMP     22$             ;WAIT FOR ANOTHER BUFFER
3731  017064  012737  000021  002452  36$:    MOV     #21,ERNUM
3732  017072  023727  017136  000001    CMP     30$,#1          ;IS ONE OF THE TWO BUFFERS A RX BUFFER?
3733  017100  001021                    BNE     8$              ;B=NO TO ERROR, #=21
3734                                    ;MOVE TO NEXT BUFFER
3735  017102  062737  020000  002500    ADD     #20000,CURBUF
3736  017110  103002                    BCC     6$
3737  017112  005237  002476            INC     CUREA
3738  017116  000137  016100    6$:     JMP     2$              ;TRY NEXT BUFFER
3739  017122                    26$:
3740  017122  004737  031650            JSR     PC,GETLIN       ;GET THE NEXT LINE NUMBER
3741  017126                    12$:
3742  017126  000413                    BR      TST33           ;;B=TEST DONE OR BYPASSED
3743  017130  000137  016036            JMP     1$              ;RETURN FOR NEXT LINE
3744
3745  017134  000000    7$:     0               ;COUNT LOCATION
3746  017136  000000    30$:    0               ;COUNT OF RECEIVE BUFFERS
3747  017140  000000    31$:    0               ;TOTAL BUFFER COUNT
3748  017142  000000    32$:    0               ;HIGH-ORDER BITS SAVE LOCATION
3749
3750  017144            8$:
3751  017144  004737  031470            JSR     PC,GETCSR       ;GET CONTENTS OF THE CSRS
3752  017150  104032                    ERROR+  32
3753  017152  000137  016036            JMP     1$
3754
3755                                    ;;*****************************************************************
3756                                            ;INTIN
3757                                            ;THIS TEST WILL CHECK THE INPUT REQUEST INTERRUPT LOGIC
3758                                            ;AND FIRMWARE ARBITRATION BY INITIALIZING THE INPUT REQUEST
3759                                            ;VECTOR (XX0) WITH A CORRECT RETURN ADDRESS AND THE OUTPUT REQUEST
3760                                            ;VECTOR WITH ADDRESS TO ERROR FLAG ROUTINE.
3761                                            ;THE INPUT REQUEST IS FIRST DONE WITH THE PROCESSOR STATUS
3762                                            ;DROPPED TO 0 AND THE INTERRUPT ENABLE BIT NOT SET TO CHECK
3763                                            ;THAT NO INTERRUPT OCCURS WHEN THE 'RDYIN' (BITS 7-SEL-0) SETS.
3764                                            ;THEN THE INPUT REQUEST IS MADE WITH THE INTERRUPT ENABLE
3765                                            ;BIT SET AND THE PROCESSOR STATUS AT 0 TO CHECK THAT THE INTERRUPT
3766                                            ;OCCURS TO THE CORRECT VECTOR ADDRESS
3767                                            ;THEN THE PROCESSOR STATUS IS SET TO LEVEL 7 THE REQUEST MADE
3768                                            ;WITH THE INTERRUPT ENABLE BIT SET AND TEST THAT THE INTERRUPT DOES
3769                                            ;NOT OCCUR UNTIL THE CORRECT PROCESSOR STATUS IS REACHED
3770
3771                                    ;;*****************************************************************
3772
3773                                            ;TEST   33
3774                                    ;;*****************************************************************
3775  017156  000004            TST33:  SCOPE
```

```
3776  017160  012737  000033  002460          MOV     #33,TSTNUM      ;LOAD THE WD OF THIS TEST
3777  017166  004737  030244                  JSR     PC,SETLIN       ;SETUP THE FIRST LINE
3778  017172  012737  017200  001110          MOV     #1$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
3779  017200  012737  000001  002452  1$:     MOV     #1,ERNUM        ;INITIALIZE ERR #
3780  017206  005037  002464                  CLR     WAS
3781  017212  004737  030664                  JSR     PC,INTKMC       ;INITIALIZE KMC-11 FIRMWARE
3782  017216  000564                          BR      10$     ;FIRMWARE FAILED TO INITIALIZE #=1
3783                                          ;PRIME INTERRUPT VECTORS, DROP PROCESSOR STATUS TO 0, AND ISSUE
3784                                          ;A REQUEST IN W/O I.E. IN SET
3785  017220  013700  002300                  MOV     VECIN,R0
3786  017224  012720  017602                  MOV     #11$,(R0)+      ;PRIME INPUT VECTOR
3787  017230  012720  000340                  MOV     #PR7,(R0)+      ;PRIME INPUT STATUS LEVEL
3788  017234  012720  017612                  MOV     #12$,(R0)+      ;PRIME OUTPUT VECTOR
3789  017240  012710  000340                  MOV     #PR7,(R0)       ;PRIME OUTPUT STATUS LEVEL
3790  017244  005237  002452                  INC     ERNUM
3791  017250  004737  031274                  JSR     PC,STCLK        ;SET MAINT LOOP + START CLOCK
3792  017254  000545                          BR      10$             ;MAINTENANCE COMMAND NOT ISSUED #=1
3793  017256  142737  000340  177776          BICB    #PR7,PS         ;SET P.S. TO 0
3794  017264  112777  000043  162766          MOVB    #43,@SEL0       ;LOAD INIT. IN REQ. W/O INT. EN
3795  017272  005037  001160                  CLR     $TMP0
3796  017276  105777  162756          2$:     TSTB    @SEL0           ;IS REQUEST GRANTED?
3797  017302  100405                          BMI     3$              ;B=YES
3798  017304  005237  001160                  INC     $TMP0           ;ALLOW TIME FOR RESPONSE
3799  017310  001372                          BNE     2$
3800  017312  000526                          BR      10$             ;REPORT REQUEST IN 'RDYIN'' FAILED TO SET #=2
3801  017314  000240                          NOP
3802  017316  062737  000002  002452  3$:     ADD     #2,ERNUM        ;NO INTERRUPT OCCURED
3803  017324  012737  000340  177776          MOV     #PR7,PS         ;SET PROCESSOR BACK TO LEVEL 7
3804  017332  004737  030664                  JSR     PC,INTKMC       ;INITIALIZE KMC-11 FIRMWARE
3805  017336  000514                          BR      10$             ;2ND. INITIALIZE OF F.W. FAILED #=4
3806  017340  004737  031274                  JSR     PC,STCLK        ;SET MAINT LOOP + START CLOCK
3807  017344  000511                          BR      10$
3808  017346  005237  002452                  INC     ERNUM           ;
3809  017352  012777  017410  162720          MOV     #6$,@VECIN      ;LOAD RET. ADDRESS FOR LEGAL INTERRUPT
3810  017360  042737  000340  177776          BIC     #PR7,PS         ;DROP PROCESSOR STATUS TO 0
3811  017366  112777  000143  162664          MOVB    #143,@SEL0      ;INT. ENABLE, REQ.IN INIT.
3812  017374  004737  031714                  JSR     PC,SYNTIM       ;WAIT A WHILE
3813  017400  012737  000340  177776          MOV     #PR7,PS         ;RESET PROCESSO. STATUS LEVEL
3814  017406  000470                          BR      10$             ;REPORT 'RDYIN'' FAILED TO SET (2ND) #=5/ INT. WRONG VEC.
3815  017410  062737  000002  002452  6$:     ADD     #2,ERNUM
3816  017416  022626                          POP2SP                  ;CLEAN THE STACK
3817  017420  005726                          POPSP
3818                                          ;NOW TEST THAT INTERRUP OCCURS AT THE PROPER PROCESSOR STATUS LEVEL
3819  017422  012737  000340  177776          MOV     #PR7,PS
3820  017430  004737  030664                  JSR     PC,INTKMC       ;INITIALIZE KMC-11 FIRMWARE
3821  017434  000455                          BR      10$             ;F.W. FAILED TO INIT. #=7
3822  017436  004737  031274                  JSR     PC,STCLK        ;SET MAINT LOOP + START CLOCK
3823  017442  000452                          BR      10$
3824  017444  005237  002452                  INC     ERNUM
3825  017450  012777  017540  162622          MOV     #9$,@VECIN      ;LOAD TRAP ADDRESS OF INTERRUPT
3826  017456  005037  001160                  CLR     $TMP0
3827  017462  112777  000143  162570          MOVB    #143,@SEL0      ;INT. ENABLE REQ. IN.
3828  017470  105777  162564          7$:     TSTB    @SEL0           ;IS REQUEST GRANTED?
3829  017474  100404                          BMI     8$              ;B=YES
3830  017476  005237  001160                  INC     $TMP0
3831  017502  001372                          BNE     7$              ;NO TRY AGAIN
```

```
3832  017504  000431                          BR      10$             ;REPORT REQUEST IN 'RDYIN' FAILED TO SET #=10
3833  017506  005237  002452          8$:     INC     ERNUM
3834  017512  162737  000040  177776          SUB     #40,PS          ;KEEP DROPPING STATUS UNTIL INT. OCCURS.
3835  017520  132737  000340  177776          BITB    #PR7,PS         ;AT LEVEL 0
3836  017526  001367                          BNE     8$              ;B=NO
3837  017530  152737  000340  177776          BISB    #PR7,PS
3838  017536  000414                          BR      10$             ;REPORT INT. FAILED
3839  017540  116637  000002  002464  9$:     MOVB    2(SP),WAS       ;GET LEVEL INTERRUPT OCCURED AT
3840  017546  042737  000037  002464          BIC     #37,WAS
3841  017554  023737  002464  002304          CMP     WAS,PRIIN       ;WAS INT. LEVEL SAME AS SPECIFIED?
3842  017562  001002                          BNE     10$             ;B=NO REPORT ERROR #=11
3843  017564  022626                          POP2SP
3844  017566  000420                          BR      TST34           ;;DONE
3845                                          ;ERROR ROUTINE
3846  017570                          10$:
3847  017570  004737  031470                  JSR     PC,GETCSR       ;GET CONTENTS OF THE CSRS
3848  017574  104033                          ERROR+  33
3849  017576  000137  017200                  JMP     .$
3850
3851                                          ;INTERRUPT TRAP SERVICE ROUTINE FOR ILLEGAL INTS.
3852  017602  013737  002300  002464  11$:     MOV     VECIN, WAS      ;GET ADDRESS THAT INT. VECTORED TO
3853  017610  000403                          BR      13$
3854  017612  013737  002302  002464  12$:     MOV     VECOUT,WAS      ;GET ADDRESS THAT INT. VECTORED TO
3855  017620  022626                  13$:    POP2SP
3856  017622  005237  002452                  INC     ERNUM
3857  017626  000760                          BR      10$
3858
3859
3860                                          ;FAIL #'S
3861                                          ;1=FAILURE IN TEST INITIALIZE ROUTINES (WAS=N/A)
3862                                          ;2='RDY-IN'' FAILED TO SET (WAS=N/A)
3863                                          ;3=ILLEGAL INTERRUPT OCCURED (W/PS @ 7) (WAS=VECTOR TRAPPED TO)
3864                                          ;4=FIRMWARE INITIALIZE FAILED AFTER RDYIN SET (WAS=0=N/A)
3865                                          ;OR CLK FAILED TO START
3866                                          ;5=2ND. RDYIN FAILED TO SET (WAS=0=N/A)
3867                                          ;6=INTERRUPTED TO WRONG VECTOR ADDRESS (WAS=VECTOR ADDRESS TRAPPED TO)
3868                                          ;7=FIRMWARE FAILED TO INIT. AFTER INPUT INTERRUPT (WAS=0=N/A)
3869                                          ;10=3RD. RDY-IN FAILED TO SET (WAS=0=N/A)
3870                                          ;11=INTERRUPT OCCURED AT LEVEL OTHER THAN SPECIFIED (WAS=PS WORD @)
3871
3872                                  ;;******************************************************************
3873
3874                                          ;INTOUT
3875                                          ;THIS TEST WILL CHECK THAT AN OUTPUT REQUEST INTERRUPT CAN CORRECTLY BE
3876                                          ;EXECUTED TO INTERRUPT VECTOR XX4 AND TEST THE LOGIC AND
3877                                          ;FIRMWARE ARBITRATION.
3878                                          ;A TRANSMIT AND RECEIVE BUFFER IS QUEUED TO LINE 0
3879                                          ;WITH THE PROCESSOR STATUS AT 0 AND THE ''IEO'' BIT NOT SET
3880                                          ;A TEST IS DONE TO CHECK THAT NO INTERRUPT OCCURS.
3881                                          ;THE FIRMWARE IS REINITIALIZED THE BUFFERS REQUEUED
3882                                          ;WITH THE ''IEO'' BIT SET AND THE PROCESSOR STATUS AT 0
3883                                          ;A CHECK IS DONE TO TEST THAT THE INTERRUPT OCCURS TO THE
3884                                          ;OUTPUT VECTOR ADDRESS XX4.
3885                                  ;;******************************************************************
3886
3887
```

```
                                        ;TEST   34
                                    ;;*****************************************************************
017630  000004                      TST34:  SCOPE
017632  012737  000034  002460              MOV     #34,TSTNUM      ;LOAD THE WD OF THIS TEST
017640  004737  030244                      JSR     PC,SETLIN       ;SETUP THE FIRST LINE
017644  012737  017652  001110              MOV     #1$,$LPERR      ;LOAD LOOP ADDRESS (LOOP ON ERROR)
017652  005037  002464              1$:     CLR     WAS
017656  012737  000001  002452              MOV     #1,ERNUM        ;INITIALIZE ERR #
017664  004737  030664                      JSR     PC,INITKMC      ;INITIALIZE KMC-11 FIRMWARE
017670  000565                      BR      6$      ;FIRMWARE FAILED TO INIT. #=1
                                    ;PRIME INTERRUPT VECTORS, DROP PROCESSOR STATUS TO 0, AND
                                    ;QUEUE A RECEIVE AND TRANSMIT BUFFER TO LINE 0, CHECK
                                    ;THAT BOTH BUFFERS RETURN WITH OUT GENERATING AN INTERRUPT.
017672  013700  002300              MOV     VECIN,R0        ;GET VECTOR ADDRESS
017676  012720  020256              MOV     #7$,(R0)+       ;PRIME INPUT VECTOR
017702  012720  000340              MOV     #PR7,(R0)+      ;
017706  012720  020266              MOV     #8$,(R0)+       ;PRIME OUTPUT VECTOR
017712  012710  000340              MOV     #PR7,(R0)
017716  005237  002452              INC     ERNUM
017722  142737  000340  177776      BICB    #PR7,PS         ;DROP PROCESSOR STATUS TO 0
017730  012737  052660  002522      MOV     #RBUF,BUFADR    ;SET BUFFER ADDRESS
017736  004737  031204              JSR     PC,INTLNE       ;INITIALIZE LINE (# IN CURLIN)
017742  000540                      BR      6$              ;LINE FAILED TO INITIALIZE #=1
017744  004737  031274              JSR     PC,STCLK        ;SET MAINT LOOP + START CLOCK
017750  000535                      BR      6$              ;MAINTENANCE COMMAND NOT ISSUED #=1
017752  005237  002452              INC     ERNUM
017756  012737  000006  002526      MOV     #6,BUFCNT       ;A LARGER REC. BUFF. FOR CRC-32
017764  004737  031344              JSR     PC,RIN          ;LOAD A RECEIVE BUFFER IN
017770  000525                      BR      6$              ;RECEIVE BUFFER FAILED TO LOAD #=2
017772  005237  002452              INC     ERNUM
017776  012737  000002  002526      MOV     #2,BUFCNT       ;XMIT BUFFER
020004  004737  031354              JSR     PC,XIN          ;LOAD A TRANSMIT BUFFER IN
020010  000515                      BR      6$              ;TRANSMIT BUFFER FAILED TO LOAD #=3
020012  005237  002452              INC     ERNUM
                                    ;WAIT FOR THE 2 BUFFERS TO RETURN
020016  005037  001162              CLR     $TMP1   ;BUFFER COUNT FLAG
020022                      2$:
020022  004737  031742              JSR     PC,REQOUT       ;TEST REQUEST OUT OF KMC SETS
020026  000506                      BR      6$      ;BUFFER FAILED TO RETURN #=4 + 5=ILLEGAL INT W/O IEO
020030  105077  162230              CLRB    @SEL2   ;COMPLETE OUTPUT
020034  005137  001162              COM     $TMP1   ;2ND BUFFER
020040  001370                      BNE     2$
                                    ;NOW SET THE INTERRUPT ENABLE OUT BIT PRIME OUTPUT
                                    ;VECTOR FOR LEGAL INTERRUPT QUEUE A XMIT AND RECEIVE
                                    ;BUFFER AND TEST FOR A VALID INTERRUPT.
020042  062737  000002  002452      ADD     #2,ERNUM
020050  005037  001162              CLR     $TMP1           ;BUFFER COUNTER
020054  012777  020224  162220      MOV     #5$,@VECOUT     ;PRIME OUTPUT VECTOR FOR LEGAL INT.
020062  012737  000006  002526      MOV     #6,BUFCNT       ;REC.BUFF. UP BY 4 BYTES FOR CRC-32
020070  004737  031344              JSR     PC,RIN          ;LOAD A RECEIVE BUFFER IN
020074  000463                      BR      6$              ;2ND REC. BUFFER FAILED TO LOAD. #=6
020076  005237  002452              INC     ERNUM
020102  012737  000002  002526      MOV     #2,BUFCNT       ;XMIT BUFFER
020110  004737  031354              JSR     PC,XIN          ;LOAD A TRANSMIT BUFFER IN
020114  000453                      BR      6$              ;2ND XMIT BUFFER FAILED TO LOAD. #=7
```

```
3944  020116  005237  002452                  INC     ERNUM
3945  020122  152777  000100  162134          BISB    #100,@SEL2      ;ENABLE THE INTERRUPT
3946  020130  005037  001160          3$:     CLR     $TMP0           ;INTERRUPTS SHOULD OCCUR NOW
3947  020134  142737  000340  177776          BICB    #PR7,PS         ;RESET PROCESSOR STATUS TO 0
3948  020142  105777  162116          4$:     TSTB    @SEL2           ;
3949  020146  100412                          BMI     45$             ;OUTPUT RDY SET
3950  020150  005237  001160                  INC     $TMP0
3951  020154  001372                          BNE     4$
3952  020156  152737  000340  177776          BISB    #PR7,PS         ;SET PROCESSOR --> 7
3953  020164  062737  000002  002452          ADD     #2,ERNUM        ;REPORT BUFFER FAILED TO RETURN #=12
3954  020172  000424                          BR      6$              ;#10=INT. TO WRONG VECTOR ***
3955  020174  012737  000012  001164  45$:    MOV     #10.,$TMP2      ;WAIT FOR POSSIBLE INT. DELAY(FIRM.W)
3956  020202  005337  001164          46$:    DEC     $TMP2
3957  020206  001375                          BNE     46$
3958  020210  005237  002452                  INC     ERNUM
3959  020214  052737  000340  177776          BIS     #PR7,PS
3960  020222  000410                          BR      6$      ;FAIL #=11
3961                                                          ;INT. FAILED
3962  020224  022626                  5$:     POP2SP          ;CLEAN STACK
3963  020226  042777  000200  162030          BIC     #200,@SEL2      ;COMPLETE OUTPUT
3964  020234  005137  001162                  COM     $TMP1
3965  020240  001421                          BEQ     TST35           ;;DONE
3966  020242  000732                          BR      3$              ;WAIT FOR NEXT BUFFER
3967                                          ;ERROR ROUTINE
3968  020244                          6$:
3969  020244  004737  031470                  JSR     PC,GETCSR       ;GET CONTENTS OF THE CSRS
3970  020250  104034                          ERROR+  34
3971  020252  000137  017652                  JMP     1$
3972
3973                                          ;INTERRUPT TRAP SERVICE ROUTINE FOR ILLEGAL INTS.
3974  020256  013737  002300  002464  7$:     MOV     VECIN,WAS       ;ADDRESS INT VECTORED TO
3975  020264  000403                          BR      9$
3976  020266  013737  002302  002464  8$:     MOV     VECOUT,WAS
3977  020274  022626                  9$:     POP2SP
3978  020276  005237  002452                  INC     ERNUM
3979  020302  000760                          BR      6$
3980
3981
3982                                          ;FAIL #S
3983                                          ;1=FAILURE IN TEST INITIALIZATION ROUTINES (WAS=N/A)
3984                                          ;2=RECEIVE BUFFER FAILED TO LOAD
3985                                          ;3=TRANSMIT BUFFER FAILED TO LOAD
3986                                          ;4=BUFFER FAILED TO RETURN
3987                                          ;5=ILLEGAL INTERRUPT WITHOUT IEO SET (WAS=VECTOR TRAPPED TO)
3988                                          ;6=2ND RECEIVE BUFFER FAILED TO LOAD
3989                                          ;7=2ND XMIT BUFFER FAILED TO LOAD
3990                                          ;10=INTERRUPT OCCURED TO WRONG VECTOR (WAS=VECTOR TRAPPED TO)
3991                                          ;11=INTERRUPT FIALED WHEN 'RDYOUT' SET (WAS=N/A)
3992                                          ;12=BUFFER FAILED TO RETURN (NO 'RDYOUT') (WAS=N/A)
3993
3994                                  ;;**************************************************************************
3995  020304  0000C4                  TST35:  SCOPE
3996  020306  005037  001102                  CLR     $TSTNM
3997  020312  005037  002460                  CLR     TSTNUM
3998  020316  005737  000042                  TST     @#42            ;IF A MONITOR NO UNIT PASSES REPORTED
3999  020322  001021                          BNE     1$
```

```
 4000  020324  032777  100000  160606          BIT     #BIT15,@SWR     ;INHIBIT END REPORTS?
 4001  020332  001015                          BNE     1$              ;BR=YES
 4002  020334  104401  020400                  TYPE    ,UNTDON
 4003  020340  013746  002456                  MOV     CUNIT,-(SP)
 4004  020344  104405                          TYPDS
 4005  020346  105737  002311                  TSTB    MODE            ;BOP OR CCP
 4006  020352  100003                          BPL     15$             ;B=CCP
 4007  020354  104401  020416                  TYPE    ,MBOP
 4008  020360  000402                          BR      1$
 4009  020362  104401  020410          15$:    TYPE    ,MCCP
 4010  020366                          1$:     ;GET NEXT KMC OR REPORT AN END PASS
 4011  020366  004737  026506                  JSR     PC,GETKMC       ;GET NEXT ENABLED KMC11
 4012  020372  000414                          BR      TST36           ;;REPORT AN END PASS
 4013  020374  000137  002376                  JMP     LTEST
 4014  020400  005015  047125  052111  UNTDON: .ASCIZ   <15><12>/UNIT /
 4015  020406  000040
 4016  020410  020040  041503  000120  MCCP:   .ASCIZ   /  CCP/
 4017  020416  020040  047502  000120  MBOP:   .ASCIZ   /  BOP/
 4018
 4019                                          .EVEN
 4020                                  ;;******************************************************************
 4021  020424  000004                  TST36:  SCOPE
 4022
 4023                                  .SBTTL  END OF PASS ROUTINE
 4024
 4025                                  ;;******************************************************************
 4026                                  ;*INCREMENT THE PASS NUMBER ($PASS)
 4027                                  ;*INDICATE END-OF-PROGRAM AFTER 1 PASSES THRU THE PROGRAM
 4028                                  ;*TYPE 'END PASS #XXXXX' (WHERE XXXXX IS A DECIMAL NUMBER)
 4029                                  ;*IF THERES A MONITOR GO TO IT
 4030                                  ;*IF THERE ISN'T JUMP TO RESTRT
 4031
 4032  020426                          $EOP:
 4033  020426  000004                          SCOPE
 4034  020430  005037  001102                  CLR     $TSTNM          ;;ZERO THE TEST NUMBER
 4035  020434  005037  001166                  CLR     $TIMES          ;;ZERO THE NUMBER OF ITERATIONS
 4036  020440  005237  001100                  INC     $PASS           ;;INCREMENT THE PASS NUMBER
 4037  020444  042737  100000  001100        BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
 4038  020452  005327                          DEC     (PC)+           ;;LOOP?
 4039  020454  000001          $EOPCT: .WORD   1
 4040  020456  003022                          BGT     $DOAGN          ;;YES
 4041  020460  012737                          MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
 4042  020462  000001          $ENDCT: .WORD   1
 4043  020464  020454                          $EOPCT
 4044  020466  104401  020533                  TYPE    ,$ENDMG         ;;TYPE 'END PASS #''
 4045  020472  013746  001100                  MOV     $PASS,-(SP)     ;;SAVE $PASS FOR TYPEOUT
 4046  020476  104405                          TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
 4047  020500  104401  020530                  TYPE    ,$ENULL         ;;TYPE A NULL CHARACTER
 4048  020504  013700  000042          $GET42: MOV     @#42,R0         ;;GET MONITOR ADDRESS
 4049  020510  001405                          BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
 4050  020512  000005                          RESET                   ;;CLEAR THE WORLD
 4051  020514  004710                  $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
 4052  020516  000240                          NOP                     ;;SAVE ROOM
 4053  020520  000240                          NOP                     ;;FOR
 4054  020522  000240                          NOP                     ;;ACT11
 4055  020524                          $DOAGN:
```

```
4056  020524  000137                          JMP     @(PC)+          ;;RETURN
4057  020526  002362                  $RTNAD: .WORD   RESTRT
4058  020530     377      377      000 $ENULL: .BYTE   -1,-1,0         ;;NULL CHARACTER STRING
4059  020533     015  042412  042116 $ENDMG: .ASCIZ  <15><12>/END PASS #/
4060  020540  050040  051501  020123
4061  020546  000043
4062
4063                                  .SBTTL  SCOPE HANDLER ROUTINE
4064
4065                                  ;;**********************************************************************
4066                                  ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
4067                                  ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
4068                                  ;*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
4069                                  ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
4070                                  ;*SW14=1         LOOP ON TEST
4071                                  ;*SW11=1         INHIBIT ITERATIONS
4072                                  ;*SW09=1         LOOP ON ERROR
4073                                  ;*SW08=1         LOOP ON TEST IN SWR<7:0>
4074                                  ;*CALL
4075                                  ;*      SCOPE           ;;SCOPE=IOT
4076  020550                          $SCOPE:
4077  020550  104407                          CKSWR                   ;;TEST  FOR CHANGE IN SOFT-SWR
4078                                  ;;GO TO ERROR ROUTINE IF RETURN PC LESS THAN 1002
4079                                  ;;OTHERWISE CONTINUE
4080  020552  021627  001002                  CMP     (SP),#1002      ;;UNEXPECTED TRAP OR INTERRRUPT
4081  020556  101002                          BHI     1$              ;;ARE TRAPPED HERE VIA IOT
4082  020560  000137  021034                  JMP     $ERROR          ;;GO PROCESS UNEXPECTED TRAP
4083  020564  032777  040000  160346 1$:      BIT     #BIT14,@SWR     ;;LOOP ON PRESENT TEST?
4084  020572  001111                          BNE     $OVER           ;;YES IF SW14=1
4085                                  ;#####START OF CODE FOR THE XOR TESTER#####
4086  020574  000416                  $XTSTR: BR      6$              ;;IF RUNNING ON THE "XOR" TESTER CHANGE
4087                                                                  ;;THIS INSTRUCTION TO A "NOP" (NOP=240)
4088  020576  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE THE CONTENTS OF THE ERROR VECTOR
4089  020602  012737  020622  000004          MOV     #5$,@#ERRVEC    ;;SET FOR TIMEOUT
4090  020610  005737  177060                  TST     @#177060        ;;TIME OUT ON XOR?
4091  020614  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
4092  020620  000463                          BR      $SVLAD          ;;GO TO THE NEXT TEST
4093  020622  022626                  5$:     CMP     (SP)+,(SP)+     ;;CLEAR THE STACK AFTER A TIME OUT
4094  020624  012637  000004                  MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
4095  020630  000423                          BR      7$              ;;LOOP ON THE PRESENT TEST
4096  020632                          6$:;#####END OF CODE FOR THE XOR TESTER#####
4097  020632  032777  000400  160300          BIT     #BIT08,@SWR     ;;LOOP ON SPEC. TEST?
4098  020640  001404                          BEQ     2$              ;;BR IF NO
4099  020642  127737  160272  001102          CMPB    @SWR,$TSTNM     ;;ON THE RIGHT TEST?    SWR<7:0>
4100  020650  001462                          BEQ     $OVER           ;;BR IF YES
4101  020652  105737  001103          2$:     TSTB    $ERFLG          ;;HAS AN ERROR OCCURRED?
4102  020656  001421                          BEQ     3$              ;;BR IF NO
4103  020660  123737  001115  001103          CMPB    $ERMAX,$ERFLG   ;;MAX. ERRORS FOR THIS TEST OCCURRED?
4104  020666  101015                          BHI     3$              ;;BR IF NO
4105  020670  032777  001000  160242          BIT     #BIT09,@SWR     ;;LOOP ON ERROR?
4106  020676  001404                          BEQ     4$              ;;BR IF NO
4107  020700  013737  001110  001106  7$:     MOV     $LPERR,$LPADR   ;;SET LOOP ADDRESS TO LAST SCOPE
4108  020706  000443                          BR      $OVER
4109  020710  105037  001103          4$:     CLRB    $ERFLG          ;;ZERO THE ERROR FLAG
4110  020714  005037  001166                  CLR     $TIMES          ;;CLEAR THE NUMBER OF ITERATIONS TO MAKE
4111  020720  000415                          BR      1$              ;;ESCAPE TO THE NEXT TEST
```

```
 4112  020722  032777  004000  160210  3$:     BIT     #BIT11,@SWR      ;;INHIBIT ITERATIONS?
 4113  020730  001011                          BNE     1$               ;;BR IF YES
 4114  020732  005737  001100                  TST     $PASS            ;;IF FIRST PASS OF PROGRAM
 4115  020736  001406                          BEQ     1$               ;;       INHIBIT ITERATIONS
 4116  020740  005237  001104                  INC     $ICNT            ;;INCREMENT ITERATION COUNT
 4117  020744  023737  001166  001104          CMP     $TIMES,$ICNT     ;;CHECK THE NUMBER OF ITERATIONS MADE
 4118  020752  002021                          BGE     $OVER            ;;BR IF 1ORE ITERATION REQUIRED
 4119  020754  012737  000001  001104  1$:     MOV     #1,$ICNT         ;;REINITIALIZE THE ITERATION COUNTER
 4120  020762  013737  021032  001166          MOV     $MXCNT,$TIMES    ;;SET NUMBER OF ITERATIONS TO DO
 4121  020770  105237  001102          $SVLAD: INCB    $TSTNM           ;;COUNT TEST NUMBERS
 4122  020774  011637  001106                  MOV     (SP),$LPADR      ;;SAVE SCOPE LOOP ADDRESS
 4123  021000  011637  001110                  MOV     (SP),$LPERR      ;;SAVE ERROR LOOP ADDRESS
 4124  021004  005037  001170                  CLR     $ESCAPE          ;;CLEAR THE ESCAPE FROM ERROR ADDRESS
 4125  021010  112737  000001  001115          MOVB    #1,$ERMAX        ;;ONLY ALLOW ONE(1) ERROR ON NEXT TEST
 4126  021016  013777  001102  160116  $OVER:  MOV     $TSTNM,@DISPLAY  ;;DISPLAY TEST NUMBER
 4127  021024  013716  001106                  MOV     $LPADR,(SP)      ;;FUDGE RETURN ADDRESS
 4128  021030  000002                          RTI                      ;;FIXES PS
 4129  021032  000001          $MXCNT: 1                                ;;MAX. NUMBER OF ITERATIONS
 4130                          .SBTTL  ERROR HANDLER ROUTINE
 4131
 4132                          ;;**************************************************************************
 4133                          ;*THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
 4134                          ;*SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
 4135                          ;*AND GO TO $ERRTYP ON ERROR
 4136                          ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
 4137                          ;*SW15=1          HALT ON ERROR
 4138                          ;*SW13=1          INHIBIT ERROR TYPEOUTS
 4139                          ;*SW10=1          BELL ON ERROR
 4140                          ;*SW09=1          LOOP ON ERROR
 4141                          ;*CALL
 4142                          ;*        ERROR   N       ;;ERROR=EMT AND N=ERROR ITEM NUMBER
 4143
 4144  021034                  $ERROR:
 4145  021034  104407                          CKSWR                    ;;TEST FOR CHANGE IN SOFT-SWR
 4146  021036  105237  001103          7$:     INCB    $ERFLG           ;;SET THE ERROR FLAG
 4147  021042  001775                          BEQ     7$               ;;DON'T LET THE FLAG GO TO ZERO
 4148  021044  013777  001102  160070          MOV     $TSTNM,@DISPLAY  ;;DISPLAY TEST NUMBER AND ERROR FLAG
 4149  021052  032777  002000  160060          BIT     #BIT10,@SWR      ;;BELL ON ERROR?
 4150  021060  001402                          BEQ     1$               ;;NO - SKIP
 4151  021062  104401  001172                  TYPE    ,$BELL           ;;RING BELL
 4152  021066  005237  001112          1$:     INC     $ERTTL           ;;COUNT THE NUMBER OF ERRORS
 4153  021072  011637  001116                  MOV     (SP),$ERRPC      ;;GET ADDRESS OF ERROR INSTRUCTION
 4154  021076  162737  000002  001116          SUB     #2,$ERRPC
 4155  021104  117737  160006  001114          MOVB    @$ERRPC,$ITEMB   ;;STRIP AND SAVE THE ERROR ITEM CODE
 4156  021112  032777  020000  160020          BIT     #BIT13,@SWR      ;;SKIP TYPEOUT IF SET
 4157  021120  001055                          BNE     20$              ;;SKIP TYPEOUTS
 4158  021122  021627  001002                  CMP     (SP),#1002       ;;IF RETURN PC LESS THAN 1002
 4159  021126  101046                          BHI     12$              ;;ERROR IS ILLEGAL TRAP
 4160                  ;;PROCESS UNEXPECTED TRAP OR INTERRUPT
 4161  021130  016637  000004  001116          MOV     4(SP),$ERRPC     ;;GET PC AT TIME OF FALSE TRAP
 4162  021136  162737  000002  001116          SUB     #2,$ERRPC        ;;ADJUST PC
 4163  021144  104401  021210                  TYPE    ,10$             ;;TYPE HEADER
 4164  021150  013746  001116                  MOV     $ERRPC,-(SP)     ;;SAVE $ERRPC FOR TYPEOUT
 4165  021154  104402                          TYPOC                    ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
 4166  021156  104401  021216                  TYPE    ,11$
 4167  021162  162716  000004                  SUB     #4,(SP)          ;;GET FALSE TRAP VECTOR ADDR
```

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 4168  021166  011637  001116                    MOV     (SP),$ERRPC
 4169  021172  013746  001116                    MOV     $ERRPC,-(SP)    ;;SAVE $ERRPC FOR TYPEOUT
 4170  021176  104402                            TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
 4171  021200  104401  001177                    TYPE    ,$CRLF
 4172  021204  022626                            CMP     (SP)+,(SP)+     ;;POP FALSE TRAP VECTOR PC&ADDR
 4173  021206  000422                            BR      20$
 4174  021210  050200  036503  000040  10$:     .ASCIZ  <200>'PC= '
 4175  021216  020040  047125  054105  11$:     .ASCIZ  '  UNEXPECTED TRAP TO '
 4176  021224  042520  052103  042105
 4177  021232  052040  040522  020120
 4178  021240  047524  000040
 4179                                            .EVEN
 4180  021244                            12$:
 4181  021244  004737  021330                    JSR     PC,$ERRTYP      ;;GO TO USER ERROR ROUTINE
 4182  021250  104401  001177                    TYPE    ,$CRLF
 4183  021254                            20$:
 4184  021254  005777  157660            2$:     TST     @SWR            ;;HALT ON ERROR
 4185  021260  100002                            BPL     3$              ;;SKIP IF CONTINUE
 4186  021262  000000                            HALT                    ;;HALT ON ERROR!
 4187  021264  104407                            CKSWR                   ;;TEST FOR CHANGE IN SOFT-SWR
 4188  021266  032777  001000  157644  3$:      BIT     #BIT09,@SWR     ;;LOOP ON ERROR SWITCH SET?
 4189  021274  001402                            BEQ     4$              ;;BR IF NO
 4190  021276  013716  001110                    MOV     $LPERR,(SP)     ;;FUDGE RETURN FOR LOOPING
 4191  021302  005737  001170            4$:     TST     $ESCAPE         ;;CHECK FOR AN ESCAPE ADDRESS
 4192  021306  001402                            BEQ     5$              ;;BR IF NONE
 4193  021310  013716  001170                    MOV     $ESCAPE,(SP)    ;;FUDGE R "URN ADDRESS FOR ESCAPE
 4194  021314                            5$:
 4195  021314  022737  020514  000042            CMP     #$ENDAD,@#42    ;;ACT-11 AUTO-ACCEPT?
 4196  021322  001001                            BNE     6$              ;;BRANCH IF NO
 4197  021324  000000                            HALT                    ;;YES
 4198  021326                            6$:
 4199  021326  000002                            RTI                     ;;RETURN
 4200                                    .SBTTL  ERROR MESSAGE TYPEOUT ROUTINE
 4201
 4202                                    ;;**********************************************************************
 4203                                    ;*THIS ROUTINE USES THE "ITEM CONTROL BYTE" ($ITEMB) TO DETERMINE WHICH
 4204                                    ;*ERROR IS TO BE REPORTED. IT THEN OBTAINS, FROM THE "ERROR TABLE" ($ERRTB),
 4205                                    ;*AND REPORTS THE APPROPRIATE INFORMATION CONCERNING THE ERROR.
 4206
 4207  021330                            $ERRTYP:
 4208  021330  104401  001177                    TYPE    ,$CRLF          ;;"CARRIAGE RETURN" & "LINE FEED"
 4209  021334  010046                            MOV     R0,-(SP)        ;;SAVE R0
 4210  021336  005000                            CLR     R0              ;;PICKUP THE ITEM INDEX
 4211  021340  153700  001114                    BISB    @#$ITEMB,R0
 4212  021344  001004                            BNE     1$              ;;IF ITEM NUMBER IS ZERO, JUST
 4213                                                                    ;;TYPE THE PC OF THE ERROR
 4214  021346  013746  001116                    MOV     $ERRPC,-(SP)    ;;SAVE $ERRPC FOR TYPEOUT
 4215                                                                    ;;ERROR ADDRESS
 4216  021352  104402                            TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
 4217  021354  000445                            BR      10$             ;;GET OUT
 4218  021356  005300                    1$:     DEC     R0              ;;ADJUST THE INDEX SO THAT IT WILL
 4219  021360  006300                            ASL     R0              ;;      WORK FOR THE ERROR TABLE
 4220  021362  006300                            ASL     R0
 4221  021364  006300                            ASL     R0
 4222  021366  062700  001202                    ADD     #$ERRTB,R0      ;;FORM TABLE POINTER
 4223  021372  012037  021402                    MOV     (R0)+,2$        ;;PICKUP "ERROR MESSAGE" POINTER
```

```
4224  021376  001404                    BEQ     3$              ;;SKIP TYPEOUT IF NO POINTER
4225  021400  104401                    TYPE                    ;;TYPE THE 'ERROR MESSAGE'
4226  021402  000000            2$:     .WORD   0               ;;'ERROR MESSAGE' POINTER GOES HERE
4227  021404  104401  001177            TYPE    ,$CRLF          ;;'CARRIAGE RETURN' & 'LINE FEED'
4228  021410  012037  021420    3$:     MOV     (R0)+,4$        ;;PICKUP 'DATA HEADER' POINTER
4229  021414  001404                    BEQ     5$              ;;SKIP TYPEOUT IF 0
4230  021416  104401                    TYPE                    ;;TYPE THE 'DATA HEADER'
4231  021420  000000            4$:     .WORD   0               ;;'DATA HEADER' POINTER GOES HERE
4232  021422  104401  001177            TYPE    ,$CRLF          ;;'CARRIAGE RETURN' & 'LINE FEED'
4233  021426  010146            5$:     MOV     R1,-(SP)        ;;SAVE R1
4234  021430  012001                    MOV     (R0)+,R1        ;;PICKUP 'DATA TABLE' POINTER
4235  021432  001415                    BEQ     9$              ;;BR IF NO DATA TO BE TYPED
4236  021434  012000                    MOV     (R0)+,R0        ;;PICKUP 'DATA FORMAT' POINTER
4237  021436  105720            6$:     TSTB    (R0)+           ;;'OCTAL' OR 'DECIMAL'
4238  021440  001003                    BNE     7$              ;;BR IF DECIMAL
4239  021442  013146                    MOV     @(R1)+,-(SP)    ;;SAVE @(R1)+ FOR TYPEOUT
4240  021444  104402                    TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
4241  021446  000402                    BR      8$
4242  021450                    7$:
4243  021450  013146                    MOV     @(R1)+,-(SP)    ;;SAVE @(R1)+ FOR TYPEOUT
4244  021452  104405                    TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
4245  021454  005711            8$:     TST     (R1)            ;;IS THERE ANOTHER NUMBER?
4246  021456  001403                    BEQ     9$              ;;BR IF NO
4247  021460  104401  021500            TYPE    ,11$            ;;TYPE TWO(2) SPACES
4248  021464  000764                    BR      6$              ;;LOOP
4249
4250  021466  012601            9$:     MOV     (SP)+,R1        ;;RESTORE R1
4251  021470  012600            10$:    MOV     (SP)+,R0        ;;RESTORE R0
4252  021472  104401  001177            TYPE    ,$CRLF          ;;'CARRIAGE RETURN' & 'LINE FEED'
4253  021476  000207                    RTS     PC              ;;RETURN
4254  021500  020040     000    11$:     .ASCIZ  /  /            ;;TWO(2) SPACES
4255          021504                    .EVEN
4256                            .SBTTL  READ AN OCTAL NUMBER FROM THE TTY
4257
4258                            ;;**************************************************************************
4259                            ;*THIS ROUTINE WILL READ AN OCTAL (ASCII) NUMBER FROM THE TTY AND
4260                            ;*CHANGE IT TO BINARY.
4261                            ;*THE INPUT CHARACTERS WILL BE CHECKED TO INSURED THEY ARE LEGAL
4262                            ;*OCTAL DIGITS. IF AN ILLEGAL CHARACTER IS READ A '?' WILL BE TYPED
4263                            ;*FOLLOWED BY A CARRIAGE RETURN-LINE FEED. THE COMPLETE NUMBER MUST
4264                            ;*THEN BE RETYPED. THE INPUT IS TERMINATED BY TYPING A CARRIAGE RETURN.
4265                            ;*CALL:
4266                            ;*      RDOCT                   ;;READ AN OCTAL NUMBER
4267                            ;*      RETURN HERE             ;;LOW ORDER BITS ARE ON TOP OF THE STACK
4268                            ;*                              ;;HIGH ORDER BITS ARE IN $HIOCT
4269
4270  021504  011646            $RDOCT: MOV     (SP),-(SP)      ;;PROVIDE SPACE FOR THE
4271  021506  016666  000004  000002    MOV     4(SP),2(SP)     ;;INPUT NUMBER
4272  021514  010046                    MOV     R0,-(SP)        ;;PUSH R0 ON STACK
4273  021516  010146                    MOV     R1,-(SP)        ;;PUSH R1 ON STACK
4274  021520  010246                    MOV     R2,-(SP)        ;;PUSH R2 ON STACK
4275  021522  104411            1$:     RDLIN                   ;;READ AN ASCIZ LINE
4276  021524  012600                    MOV     (SP)+,R0        ;;GET ADDRESS OF 1ST CHARACTER
4277  021526  010037  021632            MOV     R0,5$           ;;AND SAVE IT
4278  021532  005001                    CLR     R1              ;;CLEAR DATA WORD
4279  021534  005002                    CLR     R2
```

```
                                2$:     MOVB    (R0)+,-(SP)     ;;PICKUP THIS CHARACTER
                                        BEQ     3$              ;;IF ZERO GET OUT
                                        CMPB    #'0,(SP)        ;;MAKE SURE THIS CHARACTER
                                        BGT     4$              ;;IS AN OCTAL DIGIT
                                        CMPB    #'7,(SP)
                                        BLT     4$
                                        ASL     R1              ;;*2
                                        ROL     R2
                                        ASL     R1              ;;*4
                                        ROL     R2
                                        ASL     R1              ;;*8
                                        ROL     R2
                                        BIC     #^C7,(SP)       ;;STRIP THE ASCII JUNK
                                        ADD     (SP)+,R1        ;;ADD IN THIS DIGIT
                                        BR      2$              ;;LOOP
                                3$:     TST     (SP)+           ;;CLEAN TERMINATOR FROM STACK
                                        MOV     R1,12(SP)       ;;SAVE THE RESULT
                                        MOV     R2,$HIOCT
                                        MOV     (SP)+,R2        ;;POP STACK INTO R2
                                        MOV     (SP)+,R1        ;;POP STACK INTO R1
                                        MOV     (SP)+,R0        ;;POP STACK INTO R0
                                        RTI                     ;;RETURN
                                4$:     TST     (SP)+           ;;CLEAN PARTIAL FROM STACK
                                        CLRB    (R0)            ;;SET A TERMINATOR
                                        TYPE                    ;;TYPE UP THRU THE BAD CHAR.
                                5$:     .WORD   0
                                        TYPE    ,$QUES          ;;"?" "CR" & "LF"
                                        BR      1$              ;;TRY AGAIN
                                $HIOCT: .WORD   0               ;;HIGH ORDER BITS GO HERE
                                .SBTTL  TTY INPUT ROUTINE

                                ;;******************************************************************
                                .ENABL  LSB
 021644  000000                 $TKCNT: .WORD   0               ;;NUMBER OF ITEMS IN QUEUE
 021646  000000                 $TKQIN: .WORD   0               ;;INPUT POINTER
 021650  000000                 $TKQOUT: .WORD  0               ;;OUTPUT POINTER
 021652  000005                 $TKQSRT: .BLKB  5.              ;;TTY KEYBOARD QUEUE
         021657                 $TKQEND=.
         021660                 .EVEN

                                ;*TK INITIALIZE ROUTINE
                                ;*THIS ROUTINE WILL INITIALIZE THE TTY KEYBOARD INPUT QUEUE
                                ;*SETUP THE INTERRUPT VECTOR AND TURN ON THE KEYBOARD INTERRUPT
                                ;
                                ;*CALL:
                                ;*      JSR     PC,$TKINT
                                ;*      RETURN
                                ;
 021660  005037  021644         $TKINT: CLR     $TKCNT          ;;CLEAR COUNT OF ITEMS IN QUEUE
 021664  012737  021652  021646         MOV     #$TKQSRT,$TKQIN ;;MOVE THE STARTING ADDRESS OF THE
 021672  013737  021646  021650         MOV     $TKQIN,$TKQOUT  ;;QUEUE INTO THE INPUT & OUTPUT POINTERS.
 021700  012737  021730  000060         MOV     #$TKSRV,@#TKVEC ;;INITIALIZE THE KEYBOARD VECTOR
 021706  012737  000200  000062         MOV     #200,@#TKVEC+2  ;;"BR" LEVEL 4
 021714  005777  157226                 TST     @$TKB           ;;CLEAR DONE FLAG
 021720  012777  000100  157216         MOV     #100,@$TKS      ;;ENABLE TTY KEYBOARD INTERRUPT
 021726  000207                 $TKEXT: RTS     PC              ;;RETURN TO CALLER
```

```
                                        ;*TK SERVICE ROUTINE
                                        ;*THIS ROUTINE WILL SERVICE THE TTY KEYBOARD INTERRUPT
                                        ;*BY READING THE CHARACTER FROM THE INPUT BUFFER AND PUTTING
                                        ;*IT IN THE QUEUE.
                                        ;*IF THE CHARACTER IS A "CONTROL-C" (^C) $TKINT IS CALLED AND
                                        ;*UPON RETURN EXIT IS MADE TO THE "CONTROL-C" RESTART ADDRESS (MONIT)
                                        ;
021730  117746  157212        $TKSRV: MOVB    @$TKB,-(SP)     ;;PICKUP THE CHARACTER
021734  042716  177600                BIC     #^C177,(SP)     ;;STRIP THE JUNK
021740  021627  000021                CMP     (SP),#$XON      ;;IS IT A RANDOM XON?                   ;RAN001
021744  001002                        BNE     30$             ;;BRANCH IF NO                          ;RAN001
021746  005726                        TST     (SP)+           ;;CLEAN RANDOM XON OFF STACK            ;RAN001
021750  000002                        RTI                     ;;RETURN                                ;RAN001
021752                          30$:                                                                    ;RAN001
021752  021627  000003                CMP     (SP),#3         ;;IS IT A CONTROL C?
021756  001007                        BNE     1$              ;;BRANCH IF NO
021760  104401  023072                TYPE    ,$CNTLC         ;;TYPE A CONTROL-C (^C)
021764  004737  021660                JSR     PC,$TKINT       ;;INIT THE KEYBOARD
021770  005726                        TST     (SP)+           ;;CLEAN UP STACK
021772  000137  002076                JMP     MONIT           ;;CONTROL C RESTART
021776  021627  000007          1$:   CMP     (SP),#7         ;;IS IT A CONTROL G?
022002  001004                        BNE     2$              ;;BRANCH IF NO
022004  022737  000176  001140        CMP     #SWREG,SWR      ;;IS SOFT-SWR SELECTED?
022012  001500                        BEQ     6$              ;;GO TO SWR CHANGE
                                
022014                          2$:
022014  022737  000005  021644        CMP     #5.,$TKCNT      ;;IS THE QUEUE FULL?
022022  001004                        BNE     3$              ;;BRANCH IF NO
022024  104401  001172                TYPE    ,$BELL          ;;RING THE TTY BELL
022030  005726                        TST     (SP)+           ;;CLEAN CHARACTER OFF OF STACK
022032  000451                        BR      5$              ;;EXIT
022034  021627  000023          3$:   CMP     (SP),#23        ;;IS IT A CONTROL-S?
022040  001021                        BNE     32$             ;;BRANCH IF NO
022042  005077  157076                CLR     @$TKS           ;;DISABLE TTY KEYBOARD INTERRUPTS
022046  005726                        TST     (SP)+           ;;CLEAN CHAR OFF STACK
022050  105777  157070          31$:  TSTB    @$TKS           ;;WAIT FOR A CHAR
022054  100375                        BPL     31$             ;;LOOP UNTIL ITS THERE
022056  117746  157064                MOVB    @$TKB,-(SP)     ;;GET THE CHARACTER
022062  042716  177600                BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
022066  022627  000021                CMP     (SP)+,#21       ;;IS IT A CONTROL-Q?
022072  001366                        BNE     31$             ;;BRANCH IF NO
022074  012777  000100  157042        MOV     #100,@$TKS      ;;REENABLE TTY KEYBOARD INTERRUPTS
022102  000002                        RTI                     ;;RETURN
022104  005237  021644          32$:  INC     $TKCNT          ;;COUNT THIS CHARACTER
022110  021627  000140                CMP     (SP),#140       ;;IS IT UPPER CASE?
022114  002405                        BLT     4$              ;;BRANCH IF YES
022116  021627  000175                CMP     (SP),#175       ;;IS IT A SPECIAL CHAR?
022122  003002                        BGT     4$              ;;BRANCH IF YES
022124  042716  000040                BIC     #40,(SP)        ;;MAKE IT UPPER CASE
022130  112677  177512          4$:   MOVB    (SP)+,@$TKQIN   ;;AND PUT IT IN QUEUE
022134  005237  021646                INC     $TKQIN          ;;UPDATE THE POINTER
022140  023727  021646  021657        CMP     $TKQIN,#$TKQEND ;;GO OFF THE END?
022146  001003                        BNE     5$              ;;BRANCH IF NO
022150  012737  021652  021646        MOV     #$TKQSRT,$TKQIN ;;RESET THE POINTER
022156  000002                  5$:   RTI                     ;;RETURN
```

```
                                        ;;*****************************************************************
                                        ;*SOFTWARE SWITCH REGISTER CHANGE ROUTINE.
                                        ;*ROUTINE IS ENTERED  FROM THE TRAP HANDLER, AND WILL
                                        ;*SERVICE THE TEST FOR CHANGE IN SOFTWARE SWITCH REGISTER TRAP
                                        ;*CALL WHEN OPERATING IN TTY INTERRUPT MODE.
022160  022737  000176  001140  $CKSWR: CMP     #SWREG,SWR      ;;IS THE SOFT-SWR SELECTED
022166  001124                        BNE     15$             ;;EXIT IF NOT
022170  105777  156750                TSTB    @$TKS           ;;IS A CHAR WAITING?
022174  100121                        BPL     15$             ;;IF NOT, EXIT
022176  117746  156744                MOVB    @$TKB,-(SP)     ;;YES
022202  042716  177600                BIC     #^C177,(SP)     ;;MAKE IT  7-BIT ASCII
022206  021627  000007                CMP     (SP),#7         ;;IS IT A CONTROL-G?
022212  001300                        BNE     2$              ;;IF NOT, PUT IT IN THE TTY QUEUE
                                                            ;;AND EXIT

                                        ;;*****************************************************************
                                        ;*CONTROL IS PASSED TO THIS POINT FROM EITHER THE TTY INTERRUPT SERVICE
                                        ;*ROUTINE OR FROM THE SOFTWARE SWITCH REGISTER TRAP CALL, AS A RESULT OF A
                                        ;*CONTROL-G BEING TYPED, AND THE SOFTWARE SWITCH REGISTER BEING SELECTED.
022214  123727  001134  000001  6$:     CMPB    $AUTOB,#1       ;;ARE WE RUNNING IN AUTO-MODE?
022222  001674                        BEQ     2$              ;;BRANCH IF YES
022224  005726                        TST     (SP)+           ;;CLEAR CONTROL-G OFF STACK
022226  004737  021660                JSR     PC,$TKINT       ;;FLUSH THE TTY INPUT QUEUE
022232  005077  156706                CLR     @$TKS           ;;DISABLE TTY KEYBOARD INTERRUPTS
022236  112737  000001  001135        MOVB    #1,$INTAG       ;;SET INTERRUPT MODE INDICATOR

022244  104401  023104                TYPE    ,$CNTLG         ;;ECHO THE CONTROL-G (^G)
022250  104401  023111  $GTSWR: TYPE  ,$MSWR          ;;TYPE CURRENT CONTENTS
022254  013746  000176                MOV     SWREG,-(SP)     ;;SAVE SWREG FOR TYPEOUT
022260  104402                        TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
022262  104401  023122                TYPE    ,$MNEW          ;;PROMPT FOR NEW SWR
022266  005046          19$:    CLR     -(SP)           ;;CLEAR COUNTER
022270  005046                  CLR     -(SP)           ;;THE NEW SWR
022272  105777  156646          7$:     TSTB    @$TKS           ;;CHAR THERE?
022276  100375                  BPL     7$              ;;IF NOT TRY AGAIN

022300  117746  156642                MOVB    @$TKB,-(SP)     ;;PICK UP CHAR
022304  042716  177600                BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII

022310  021627  000003                CMP     (SP),#3         ;;IS IT A CONTROL-C?
022314  001015                        BNE     9$              ;;BRANCH IF NOT
022316  104401  023072                TYPE    ,$CNTLC         ;;YES, ECHO CONTROL-C (^C)
022322  062706  000006                ADD     #6,SP           ;;CLEAN UP STACK
022326  123727  001135  000001        CMPB    $INTAG,#1       ;;REENABLE TTY KEYBOARD INTERRUPTS?
022334  001003                        BNE     8$              ;;BRANCH IF NO
022336  012777  000100  156600        MOV     #100,@$TKS      ;;ALLOW TTY KEYBOARD INTERRUPTS
022344  000137  002076          8$:     JMP     MONIT           ;;CONTROL-C RESTART


022350  021627  000025          9$:     CMP     (SP),#25        ;;IS IT A CONTROL-U?
022354  001005                  BNE     10$             ;;BRANCH IF NOT
022356  104401  023077                TYPE    ,$CNTLU         ;;YES, ECHO CONTROL-U (^U)
022362  062706  000006          20$:    ADD     #6,SP           ;;IGNORE PREVIOUS INPUT
022366  000737                  BR      19$             ;;LET'S TRY IT AGAIN
```

```
                                ;;IS IT A <CR>?
022370 021627 000015      10$:  CMP   (SP),#15
022374 001022                   BNE   16$                ;;BRANCH IF NO
022376 005766 000004            TST   4(SP)              ;;YES, IS IT THE FIRST CHAR?
022402 001403                   BEQ   11$                ;;BRANCH IF YES
022404 016677 000002 156526     MOV   2(SP),@SWR         ;;SAVE NEW SWR
022412 062706 000006      11$:  ADD   #6,SP              ;;CLEAR UP STACK
022416 104401 001177      14$:  TYPE  ,$CRLF             ;;ECHO <CR> AND <LF>
022422 123727 001135 000001     CMPB  $INTAG,#1          ;;RE-ENABLE TTY KBD INTERRUPTS?
022430 001003                   BNE   15$                ;;BRANCH IF NOT
022432 012777 000100 156504     MOV   #100,@$TKS         ;;RE-ENABLE TTY KBD INTERRUPTS
022440 000002             15$:  RTI                      ;;RETURN
022442 004737 023462      16$:  JSR   PC,$TYPEC          ;;ECHO CHAR
022446 021627 000060            CMP   (SP),#60           ;;CHAR < 0?
022452 002420                   BLT   18$                ;;BRANCH IF YES
022454 021627 000067            CMP   (SP),#67           ;;CHAR > 7?
022460 003015                   BGT   18$                ;;BRANCH IF YES
022462 042726 000060            BIC   #60,(SP)+          ;;STRIP-OFF ASCII
022466 005766 000002            TST   2(SP)              ;;IS THIS THE FIRST CHAR
022472 001403                   BEQ   17$                ;;BRANCH IF YES
022474 006316                   ASL   (SP)               ;;NO, SHIFT PRESENT
022476 006316                   ASL   (SP)               ;;   CHAR OVER TO MAKE
022500 006316                   ASL   (SP)               ;;   ROOM FOR NEW ONE.
022502 005266 000002      17$:  INC   2(SP)              ;;KEEP COUNT OF CHAR
022506 056616 177776            BIS   -2(SP),(SP)        ;;SET IN NEW CHAR
022512 000667                   BR    7$                 ;;GET THE NEXT ONE
022514 104401 001176      18$:  TYPE  ,$QUES             ;;TYPE ?<CR><LF>
022520 000720                   BR    20$                ;;SIMULATE CONTROL-U
                          .DSABL  LSB


                                ;;**********************************************************************
                                ;*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
                                ;*CALL:
                                ;*      RDCHR                   ;;GET A CHARACTER FROM THE QUEUE
                                ;*      RETURN HERE             ;;CHARACTER IS ON THE STACK
                                ;*                              ;;WITH PARITY BIT STRIPPED OFF
                                ;


022522 011646             $RDCHR: MOV   (SP),-(SP)       ;;PUSH DOWN THE PC AND
022524 016666 000004 000002     MOV   4(SP),2(SP)        ;;THE PS
022532 005066 000004            CLR   4(SP)              ;;GET READY FOR A CHARACTER
022536 005046                   CLR   -(SP)              ;;PUT NEW PS ON STACK
022540 012746 022546            MOV   #64$,-(SP)         ;;PUT NEW PC ON  STACK
022544 000002                   RTI                      ;;POP NEW PC AND PS
022546                    64$:
022546 005737 021644      1$:   TST   $TKCNT             ;;WAIT ON A CHARACTER
022552 001775                   BEQ   1$
022554 005337 021644            DEC   $TKCNT             ;;DECREMENT THE COUNTER
022560 117766 177064 000004     MOVB  @$TKQOUT,4(SP)     ;;GET ONE CHARACTER
022566 005237 021650            INC   $TKQOUT            ;;UPDATE THE POINTER
022572 023727 021650 021657     CMP   $TKQOUT,#$TKQEND   ;;DID IT GO OFF OF THE END?
022600 001003                   BNE   2$                 ;;BRANCH IF NO
022602 012737 021652 021650     MOV   #$TKQSRT,$TKQOUT   ;;RESET THE POINTER
022610 000002             2$:   RTI                      ;;RETURN
                                ;;**********************************************************************
```

```
 4504                                   ;*THIS ROUTINE WILL INPUT A STRING FROM THE TTY
 4505                                   ;*CALL:
 4506                                   ;*      RDLIN                   ;;INPUT A STRING FROM THE TTY
 4507                                   ;*      RETURN HERE             ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
 4508                                   ;*                              ;;TERMINATOR WILL BE A BYTE OF ALL 0'S
 4509
 4510  022612  010346                  $RDLIN: MOV     R3,-(SP)        ;;SAVE R3
 4511  022614  005046                          CLR     -(SP)           ;;CLEAR THE RUBOUT KEY
 4512  022616  012703  023046          1$:     MOV     #$TTYIN,R3      ;;GET ADDRESS
 4513  022622  022703  023072          2$:     CMP     #$TTYIN+20.,R3  ;;BUFFER FULL?
 4514  022626  101456                          BLOS    4$              ;;BR IF YES
 4515  022630  104410                          RDCHR                   ;;GO READ ONE CHARACTER FROM THE TTY
 4516  022632  112613                          MOVB    (SP)+,(R3)      ;;GET CHARACTER
 4517  022634  122713  000177          10$:    CMPB    #177,(R3)       ;;IS IT A RUBOUT
 4518  022640  001022                          BNE     5$              ;;BR IF NO
 4519  022642  005716                          TST     (SP)            ;;IS THIS THE FIRST RUBOUT?
 4520  022644  001007                          BNE     6$              ;;BR IF NO
 4521  022646  112737  000134  023044        MOVB    #'\,9$          ;;TYPE A BACK SLASH
 4522  022654  104401  023044                  TYPE    ,9$
 4523  022660  012716  177777                  MOV     #-1,(SP)        ;;SET THE RUBOUT KEY
 4524  022664  005303                  6$:     DEC     R3              ;;BACKUP BY ONE
 4525  022666  020327  023046                  CMP     R3,#$TTYIN      ;;STACK EMPTY?
 4526  022672  103434                          BLO     4$              ;;BR IF YES
 4527  022674  111337  023044                  MOVB    (R3),9$         ;;SETUP TO TYPEOUT THE DELETED CHAR.
 4528  022700  104401  023044                  TYPE    ,9$             ;;GO TYPE
 4529  022704  000746                          BR      2$              ;;GO READ ANOTHER CHAR.
 4530  022706  005716                  5$:     TST     (SP)            ;;RUBOUT KEY SET?
 4531  022710  001406                          BEQ     7$              ;;BR IF NO
 4532  022712  112737  000134  023044        MOVB    #'\,9$          ;;TYPE A BACK SLASH
 4533  022720  104401  023044                  TYPE    ,9$
 4534  022724  005016                          CLR     (SP)            ;;CLEAR THE RUBOUT KEY
 4535  022726  122713  000025          7$:     CMPB    #25,(R3)        ;;IS CHARACTER A CTRL U?
 4536  022732  001003                          BNE     8$              ;;BR IF NO
 4537  022734  104401  023077                  TYPE    ,$CNTLU         ;;TYPE A CONTROL 'U''
 4538  022740  000726                          BR      1$              ;;GO START OVER
 4539  022742  122713  000022          8$:     CMPB    #22,(R3)        ;;IS CHARACTER A ''^R''?
 4540  022746  001011                          BNE     3$              ;;BRANCH IF NO
 4541  022750  105013                          CLRB    (R3)            ;;CLEAR THE CHARACTER
 4542  022752  104401  001177                  TYPE    ,$CRLF          ;;TYPE A ''CR'' & ''LF''
 4543  022756  104401  023046                  TYPE    ,$TTYIN         ;;TYPE THE INPUT STRING
 4544  022762  000717                          BR      2$              ;;GO PICKUP ANOTHER CHACTER
 4545  022764  104401  001176          4$:     TYPE    ,$QUES          ;;TYPE A '?'
 4546  022770  000712                          BR      1$              ;;CLEAR THE BUFFER AND LOOP
 4547  022772  111337  023044          3$:     MOVB    (R3),9$         ;;ECHO THE CHARACTER
 4548  022776  104401  023044                  TYPE    ,9$
 4549  023002  122723  000015                  CMPB    #15,(R3)+       ;;CHECK FOR RETURN
 4550  023006  001305                          BNE     2$              ;;LOOP IF NOT RETURN
 4551  023010  105063  177777                  CLRB    -1(R3)          ;;CLEAR RETURN (THE 15)
 4552  023014  104401  001200                  TYPE    ,$LF            ;;TYPE A LINE FEED
 4553  023020  005726                          TST     (SP)+           ;;CLEAN RUBOUT KEY FROM THE STACK
 4554  023022  012603                          MOV     (SP)+,R3        ;;RESTORE R3
 4555  023024  011646                          MOV     (SP),-(SP)      ;;ADJUST THE STACK AND PUT ADDRESS OF THE
 4556  023026  016666  000004  000002        MOV     4(SP),2(SP)     ;;      FIRST ASCII CHARACTER ON IT
 4557  023034  012766  023046  000004        MOV     #$TTYIN,4(SP)
 4558  023042  000002                          RTI                     ;;RETURN
 4559  023044     000                  9$:     .BYTE   0               ;;STORAGE FOR ASCII CHAR. TO TYPE
```

```
 4560  023045     000                          .BYTE   0               ;;TERMINATOR
 4561  023046  000024                $TTYIN: .BLKB   20.              ;;RESERVE 20. BYTES FOR TTY INPUT
 4562  023072  041536  005015   000  $CNTLC: .ASCIZ  /^C/<15><12>     ;;CONTROL "C"
 4563  023077     136  006525  000012 $CNTLU: .ASCIZ  /^U/<15><12>     ;;CONTROL "U"
 4564  023104  043536  005015   000  $CNTLG: .ASCIZ  /^G/<15><12>     ;;CONTROL "G"
 4565  023111     015  051412  051127 $MSWR:  .ASCIZ  <15><12>/SWR = /
 4566  023116  036440  000040
 4567  023122  020040  042516  020127 $MNEW:  .ASCIZ  /  NEW = /
 4568  023130  020075     000
 4569          023134                .EVEN
 4570                                .SBTTL  READ A DECIMAL NUMBER FROM THE TTY
 4571
 4572                                ;;******************************************************************
 4573                                ;*THIS ROUTINE WILL READ A DECIMAL (ASCII) NUMBER FROM THE TTY AND
 4574                                ;*CHANGE IT TO BINARY. IF TOO MANY CHARACTERS OR ANY ILLEGAL CHARACTERS
 4575                                ;*ARE READ A "?" FOLLOWED BY A CARRIAGE RETURN-LINE FEED WILL BE TYPED.
 4576                                ;*THE COMPLETE NUMBER MUST BE RETYPED. THE INPUT IS TERMINATED BY THE
 4577                                ;*USER TYPING A CARRIAGE RETURN. THE RANGE OF THE INPUT NUMBER IS
 4578                                ;*POSITIVE 32767 TO NEGATIVE 32768.
 4579                                ;*CALL:
 4580                                ;*      RDDEC                   ;;READ A DECIMAL NUMBER
 4581                                ;*      RETURN HERE             ;;NUMBER IS ON TOP OF THE STACK
 4582                                ;
 4583
 4584  023134  011646                $RDDEC: MOV     (SP),-(SP)      ;;PROVIDE SPACE FOR
 4585  023136  016666  000004  000002       MOV     4(SP),2(SP)     ;;THE INPUT NUMBER
 4586  023144  010046                       MOV     R0,-(SP)        ;;PUSH R0 ON STACK
 4587  023146  010146                       MOV     R1,-(SP)        ;;PUSH R1 ON STACK
 4588  023150  010246                       MOV     R2,-(SP)        ;;PUSH R2 ON STACK
 4589  023152  104411                1$:    RDLIN                   ;;READ AN ASCIZ LINE
 4590  023154  012600                       MOV     (SP)+,R0        ;;ADDRESS OF 1ST CHAR.
 4591  023156  010037  023302               MOV     R0,6$           ;;SAVE INCASE OF BAD INPUT
 4592  023162  005046                       CLR     -(SP)           ;;CLEAR DATA WORD
 4593  023164  005002                       CLR     R2              ;;SIGN SET POSITIVE
 4594  023166  122710  000055               CMPB    #'-,(R0)        ;;SEE IF A MINUS SIGN WAS TYPED
 4595  023172  001001                       BNE     2$              ;;BR IF NO MINUS SIGN
 4596  023174  112002                       MOVB    (R0)+,R2        ;;SAVE FOR LATER USE
 4597  023176  112001                2$:    MOVB    (R0)+,R1        ;;PICKUP THIS CHARACTER
 4598  023200  001424                       BEQ     3$              ;;GET OUT IF ZERO
 4599  023202  122701  000060               CMPB    #'0,R1          ;;MAKE SURE THIS CHARACTER
 4600  023206  003032                       BGT     5$              ;;IS A DIGIT BETWEEN 0 & 9
 4601  023210  122701  000071               CMPB    #'9,R1
 4602  023214  002427                       BLT     5$
 4603  023216  032716  170000               BIT     #^C7777,(SP)    ;;DON'T LET NUMBER GET TO BIG
 4604  023222  001024                       BNE     5$              ;;BR IF NUMBER WOULD OVERFLOW
 4605  023224  006316                       ASL     (SP)            ;;*2
 4606  023226  011646                       MOV     (SP),-(SP)      ;;SAVE FOR LATER
 4607  023230  006316                       ASL     (SP)            ;;*4
 4608  023232  006316                       ASL     (SP)            ;;*8.
 4609  023234  062616                       ADD     (SP)+,(SP)      ;;*10.
 4610  023236  102416                       BVS     5$              ;;OVERFLOW ISN'T ALLOWED
 4611  023240  162701  000060               SUB     #'0,R1          ;;STRIP AWAY THE ASCII JUNK
 4612  023244  060116                       ADD     R1,(SP)         ;;ADD IN THIS DIGIT
 4613  023246  102412                       BVS     5$              ;;OVERFLOW ISN'T ALLOWED
 4614  023250  000752                       BR      2$              ;;LOOP
 4615  023252  005702                3$:    TST     R2              ;;CHECK IF NUMBER IS NEG
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 4616  023254  001401                        BEQ     4$              ;;BR IF NO
 4617  023256  005416                        NEG     (SP)            ;;YES--NEGATE THE NUMBER
 4618  023260  012666  000012        4$:     MOV     (SP)+,12(SP)    ;;SAVE THE RESULT
 4619  023264  012602                        MOV     (SP)+,R2        ;;POP STACK INTO R2
 4620  023266  012601                        MOV     (SP)+,R1        ;;POP STACK INTO R1
 4621  023270  012600                        MOV     (SP)+,R0        ;;POP STACK INTO R0
 4622  023272  000002                        RTI                     ;;RETURN
 4623
 4624  023274  005726                5$:     TST     (SP)+           ;;CLEAN PARTIAL NUMBER FROM STACK
 4625  023276  105010                        CLRB    (R0)            ;;SET A TERMINATOR
 4626  023300  104401                        TYPE                    ;;TYPE THE INPUT UP TO BAD CHAR.
 4627  023302  000000                6$:     .WORD   0               ;;POINTER GOES HERE
 4628  023304  104401  001176                TYPE    ,$QUES          ;;"?" "CR" &"LF"
 4629  023310  000720                        BR      1$              ;;TRY AGAIN
 4630                          .SBTTL  TYPE ROUTINE
 4631
 4632                          ;;**********************************************************
 4633                          ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
 4634                          ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
 4635                          ;*NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
 4636                          ;*NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
 4637                          ;*NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
 4638                          ;*
 4639                          ;*CALL:
 4640                          ;*1) USING A TRAP INSTRUCTION
 4641                          ;*      TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
 4642                          ;*OR
 4643                          ;*      TYPE
 4644                          ;*      MESADR
 4645                          ;*
 4646
 4647  023312  105737  001157  $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
 4648  023316  100002                BPL     1$              ;;BR IF YES
 4649  023320  000000                HALT                    ;;HALT HERE IF NO TERMINAL
 4650  023322  000407                BR      3$              ;;LEAVE
 4651  023324  010046        1$:     MOV     R0,-(SP)        ;;SAVE R0
 4652  023326  017600  000002        MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
 4653  023332  112046        2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
 4654  023334  001005                BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
 4655  023336  005726                TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
 4656  023340  012600        60$:    MOV     (SP)+,R0        ;;RESTORE R0
 4657  023342  062716  000002        ADD     #2,(SP)         ;;ADJUST RETURN PC
 4658  023346  000002        3$:     RTI                     ;;RETURN
 4659  023350  122716  000011        CMPB    #HT,(SP)        ;;BRANCH IF <HT>
 4660  023354  001430                BEQ     8$
 4661  023356  122716  000200        CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
 4662  023362  001006                BNE     5$
 4663  023364  005726                TST     (SP)+           ;;POP  <CR><LF> EQUIV
 4664  023366  104401                TYPE                    ;;TYPE A CR AND LF
 4665  023370  001177                $CRLF
 4666  023372  105037  023600        CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
 4667  023376  000755                BR      2$              ;;GET NEXT CHARACTER
 4668  023400  004737  023462  5$:   JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
 4669  023404  123726  001156  6$:   CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
 4670  023410  001350                BNE     2$              ;;IF NO GO GET NEXT CHAR.
 4671  023412  013746  001154        MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
```

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4672
4673  023416  105366  000001          7$:     DECB    1(SP)           ;;AND THE NULL CHAR.
4674  023422  002770                          BLT     6$              ;;DOES A NULL NEED TO BE TYPED?
4675  023424  004737  023462                  JSR     PC,$TYPEC       ;;BR IF NO--GO POP THE NULL OFF OF STACK
4676  023430  105337  023600                  DECB    $CHARCNT        ;;GO TYPE A NULL
4677  023434  000770                          BR      7$              ;;DO NOT COUNT AS A COUNT
4678                                                                  ;;LOOP
4679                                  ;HORIZONTAL TAB PROCESSOR
4680
4681  023436  112716  000040          8$:     MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
4682  023442  004737  023462          9$:     JSR     PC,$TYPEC       ;;TYPE A SPACE
4683  023446  132737  000007  023600          BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
4684  023454  001372                          BNE     9$              ;;TAB STOP
4685  023456  005726                          TST     (SP)+           ;;POP SPACE OFF STACK
4686  023460  000724                          BR      2$              ;;GET NEXT CHARACTER
4687  023462                          $TYPEC:
4688  023462  105777  155456                  TSTB    @$TKS           ;;CHAR IN KYBD BUFFER?          ;MJD001
4689  023466  100022                          BPL     10$             ;;BR IF NOT                     ;MJD001
4690  023470  017746  155452                  MOV     @$TKB,-(SP)     ;;GET CHAR                      ;MJD001
4691  023474  042716  177600                  BIC     #177600,(SP)    ;;STRIP EXTRANEOUS BITS         ;MJD001
4692  023500  122716  000023                  CMPB    #$XOFF,(SP)     ;;WAS CHAR XOFF                 ;MJD001
4693  023504  001012                          BNE     102$            ;;BR IF NOT                     ;MJD001
4694  023506                          101$:                           ;                               ;MJD001
4695  023506  105777  155432                  TSTB    @$TKS           ;;WAIT FOR CHAR                 ;MJD001
4696  023512  100375                          BPL     101$            ;                               ;MJD001
4697  023514  117716  155426                  MOVB    @$TKB,(SP)      ;;GET CHAR                      ;MJD001
4698  023520  042716  177600                  BIC     #177600,(SP)    ;;STRIP IT                      ;MJD001
4699  023524  122716  000021                  CMPB    #$XON,(SP)      ;;WAS IT XON?                   ;MJD001
4700  023530  001366                          BNE     101$            ;;BR IF NOT                     ;MJD001
4701  023532                          102$:                           ;                               ;MJD001
4702  023532  005726                          TST     (SP)+           ;;FIX STACK                     ;MJD001
4703  023534                          10$:                            ;                               ;MJD001
4704  023534  105777  155410                  TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
4705  023540  100375                          BPL     10$             ;                               ;MJD001
4706  023542  116677  000002  155402          MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
4707  023550  122766  000015  000002          CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
4708  023556  001003                          BNE     1$              ;;BRANCH IF NO
4709  023560  105037  023600                  CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
4710  023564  000406                          BR      $TYPEX          ;;EXIT
4711  023566  122766  000012  000002  1$:     CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
4712  023574  001402                          BEQ     $TYPEX          ;;BRANCH IF YES
4713  023576  105227                          INCB    (PC)+           ;;COUNT THE CHARACTER
4714  023600  000000                  $CHARCNT:.WORD  0               ;;CHARACTER COUNT STORAGE
4715  023602  000207                  $TYPEX: RTS     PC
4716
4717                                  .SBTTL  CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
4718
4719                                  ;;**********************************************************************
4720                                  ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 5-DIGIT
4721                                  ;*SIGNED DECIMAL (ASCII) NUMBER AND TYPE IT. DEPENDING ON WHETHER THE
4722                                  ;*NUMBER IS POSITIVE OR NEGATIVE A SPACE OR A MINUS SIGN WILL BE TYPED
4723                                  ;*BEFORE THE FIRST DIGIT OF THE NUMBER. LEADING ZEROS WILL ALWAYS BE
4724                                  ;*REPLACED WITH SPACES.
4725                                  ;*CALL:
4726                                  ;*      MOV     NUM,-(SP)       ;;PUT THE BINARY NUMBER ON THE STACK
4727                                  ;*      TYPDS                   ;;GO TO THE ROUTINE
```

```
        023604                                $TYPDS:
        023604  010046                                  MOV     R0,-(SP)        ;;PUSH R0 ON STACK
        023606  010146                                  MOV     R1,-(SP)        ;;PUSH R1 ON STACK
        023610  010246                                  MOV     R2,-(SP)        ;;PUSH R2 ON STACK
        023612  010346                                  MOV     R3,-(SP)        ;;PUSH R3 ON STACK
        023614  010546                                  MOV     R5,-(SP)        ;;PUSH R5 ON STACK
        023616  012746  020200                          MOV     #20200,-(SP)    ;;SET BLANK SWITCH AND SIGN
        023622  016605  000020                          MOV     20(SP),R5       ;;GET THE INPUT NUMBER
        023626  100004                                  BPL     1$              ;;BR IF INPUT IS POS.
        023630  005405                                  NEG     R5              ;;MAKE THE BINARY NUMBER POS.
        023632  112766  000055  000001                  MOVB    #'-,1(SP)       ;;MAKE THE ASCII NUMBER NEG.
        023640  005000                        1$:       CLR     R0              ;;ZERO THE CONSTANTS INDEX
        023642  012703  024020                          MOV     #$DBLK,R3       ;;SETUP THE OUTPUT POINTER
        023646  112723  000040                          MOVB    #' ,(R3)+       ;;SET THE FIRST CHARACTER TO A BLANK
        023652  005002                        2$:       CLR     R2              ;;CLEAR THE BCD NUMBER
        023654  016001  024010                          MOV     $DTBL(R0),R1    ;;GET THE CONSTANT
        023660  160105                        3$:       SUB     R1,R5           ;;FORM THIS BCD DIGIT
        023662  002402                                  BLT     4$              ;;BR IF DONE
        023664  005202                                  INC     R2              ;;INCREASE THE BCD DIGIT BY 1
        023666  000774                                  BR      3$
        023670  060105                        4$:       ADD     R1,R5           ;;ADD BACK THE CONSTANT
        023672  005702                                  TST     R2              ;;CHECK IF BCD DIGIT=0
        023674  001002                                  BNE     5$              ;;FALL THROUGH IF 0
        023676  105716                                  TSTB    (SP)            ;;STILL DOING LEADING 0'S?
        023700  100407                                  BMI     7$              ;;BR IF YES
        023702  106316                        5$:       ASLB    (SP)            ;;MSD?
        023704  103003                                  BCC     6$              ;;BR IF NO
        023706  116663  000001  177777                  MOVB    1(SP),-1(R3)    ;;YES--SET THE SIGN
        023714  052702  000060                6$:       BIS     #'0,R2          ;;MAKE THE BCD DIGIT ASCII
        023720  052702  000040                7$:       BIS     #' ,R2          ;;MAKE IT A SPACE IF NOT ALREADY A DIGIT
        023724  110223                                  MOVB    R2,(R3)+        ;;PUT THIS CHARACTER IN THE OUTPUT BUFFER
        023726  005720                                  TST     (R0)+           ;;JUST INCREMENTING
        023730  020027  000010                          CMP     R0,#10          ;;CHECK THE TABLE INDEX
        023734  002746                                  BLT     2$              ;;GO DO THE NEXT DIGIT
        023736  003002                                  BGT     8$              ;;GO TO EXIT
        023740  010502                                  MOV     R5,R2           ;;GET THE LSD
        023742  000764                                  BR      6$              ;;GO CHANGE TO ASCII
        023744  105726                        8$:       TSTB    (SP)+           ;;WAS THE LSD THE FIRST NON-ZERO?
        023746  100003                                  BPL     9$              ;;BR IF NO
        023750  116663  177777  177776                  MOVB    -1(SP),-2(R3)   ;;YES--SET THE SIGN FOR TYPING
        023756  105013                        9$:       CLRB    (R3)            ;;SET THE TERMINATOR
        023760  012605                                  MOV     (SP)+,R5        ;;POP STACK INTO R5
        023762  012603                                  MOV     (SP)+,R3        ;;POP STACK INTO R3
        023764  012602                                  MOV     (SP)+,R2        ;;POP STACK INTO R2
        023766  012601                                  MOV     (SP)+,R1        ;;POP STACK INTO R1
        023770  012600                                  MOV     (SP)+,R0        ;;POP STACK INTO R0
        023772  104401  024020                          TYPE    ,$DBLK          ;;NOW TYPE THE NUMBER
        023776  016666  000002  000004                  MOV     2(SP),4(SP)     ;;ADJUST THE STACK
        024004  012616                                  MOV     (SP)+,(SP)
        024006  000002                                  RTI                     ;;RETURN TO USER
        024010  023420                        $DTBL:    10000.
        024012  001750                                  1000.
        024014  000144                                  100.
        024016  000012                                  10.
        024020  000004                        $DBLK:    .BLKW   4
```

```
                                .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE

                                ;;*****************************************************************
                                ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
                                ;*OCTAL (ASCII) NUMBER AND TYPE IT.
                                ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
                                ;*CALL:
                                ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
                                ;*      TYPOS                   ;;CALL FOR TYPEOUT
                                ;*      .BYTE   N               ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
                                ;*      .BYTE   M               ;;M=1 OR 0
                                ;*                                      ;;1=TYPE LEADING ZEROS
                                ;*                                      ;;0=SUPPRESS LEADING ZEROS
                                ;*
                                ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
                                ;*$TYPOS OR $TYPOC
                                ;*CALL:
                                ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
                                ;*      TYPON                   ;;CALL FOR TYPEOUT
                                ;*
                                ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
                                ;*CALL:
                                ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
                                ;*      TYPOC                   ;;CALL FOR TYPEOUT

024030  017646  000000          $TYPOS: MOV     @(SP),-(SP)     ;;PICKUP THE MODE
024034  116637  000001  024253          MOVB    1(SP),$OFILL    ;;LOAD ZERO FILL SWITCH
024042  112637  024255                  MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE
024046  062716  000002                  ADD     #2,(SP)         ;;ADJUST RETURN ADDRESS
024052  000406                          BR      $TYPON
024054  112737  000001  024253  $TYPOC: MOVB    #1,$OFILL       ;;SET THE ZERO FILL SWITCH
024062  112737  000006  024255          MOVB    #6,$OMODE+1     ;;SET FOR SIX(6) DIGITS
024070  112737  000005  024252  $TYPON: MOVB    #5,$OCNT        ;;SET THE ITERATION COUNT
024076  010346                          MOV     R3,-(SP)        ;;SAVE R3
024100  010446                          MOV     R4,-(SP)        ;;SAVE R4
024102  010546                          MOV     R5,-(SP)        ;;SAVE R5
024104  113704  024255                  MOVB    $OMODE+1,R4     ;;GET THE NUMBER OF DIGITS TO TYPE
024110  005404                          NEG     R4
024112  062704  000006                  ADD     #6,R4           ;;SUBTRACT IT FOR MAX. ALLOWED
024116  110437  024254                  MOVB    R4,$OMODE       ;;SAVE IT FOR USE
024122  113704  024253                  MOVB    $OFILL,R4       ;;GET THE ZERO FILL SWITCH
024126  016605  000012                  MOV     12(SP),R5       ;;PICKUP THE INPUT NUMBER
024132  005003                          CLR     R3              ;;CLEAR THE OUTPUT WORD
024134  006105                  1$:     ROL     R5              ;;ROTATE MSB INTO "C"
024136  000404                          BR      3$              ;;GO DO MSB
024140  006105                  2$:     ROL     R5              ;;FORM THIS DIGIT
024142  006105                          ROL     R5
024144  006105                          ROL     R5
024146  010503                          MOV     R5,R3
024150  006103                  3$:     ROL     R3              ;;GET LSB OF THIS DIGIT
024152  105337  024254                  DECB    $OMODE          ;;TYPE THIS DIGIT?
024156  100016                          BPL     7$              ;;BR IF NO
024160  042703  177770                  BIC     #177770,R3      ;;GET RID OF JUNK
024164  001002                          BNE     4$              ;;TEST FOR 0
024166  005704                          TST     R4              ;;SUPPRESS THIS 0?
024170  001403                          BEQ     5$              ;;BR IF YES
```

```
 4840  024172  005204                  4$:     INC     R4              ;;DON'T SUPPRESS ANYMORE 0'S
 4841  024174  052703  000060                  BIS     #'0,R3          ;;MAKE THIS DIGIT ASCII
 4842  024200  052703  000040          5$:     BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
 4843  024204  110337  024250                  MOVB    R3,8$           ;;SAVE FOR TYPING
 4844  024210  104401  024250                  TYPE    ,8$             ;;GO TYPE THIS DIGIT
 4845  024214  105337  024252          7$:     DECB    $OCNT           ;;COUNT BY 1
 4846  024220  003347                          BGT     2$              ;;BR IF MORE TO DO
 4847  024222  002402                          BLT     6$              ;;BR IF DONE
 4848  024224  005204                          INC     R4              ;;INSURE LAST DIGIT ISN'T A BLANK
 4849  024226  000744                          BR      2$              ;;GO DO THE LAST DIGIT
 4850  024230  012605                  6$:     MOV     (SP)+,R5        ;;RESTORE R5
 4851  024232  012604                          MOV     (SP)+,R4        ;;RESTORE R4
 4852  024234  012603                          MOV     (SP)+,R3        ;;RESTORE R3
 4853  024236  016666  000002  000004          MOV     2(SP),4(SP)     ;;SET THE STACK FOR RETURNING
 4854  024244  012616                          MOV     (SP)+,(SP)
 4855  024246  000002                          RTI                     ;;RETURN
 4856  024250     000                  8$:     .BYTE   0               ;;STORAGE FOR ASCII DIGIT
 4857  024251     000                          .BYTE   0               ;;TERMINATOR FOR TYPE ROUTINE
 4858  024252     000          $OCNT:  .BYTE   0               ;;OCTAL DIGIT COUNTER
 4859  024253     000          $OFILL: .BYTE   0               ;;ZERO FILL SWITCH
 4860  024254  000000          $OMODE: .WORD   0               ;;NUMBER OF DIGITS TO TYPE
 4861                          .SBTTL  TRAP DECODER
 4862
 4863                          ;;**************************************************************************
 4864                          ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
 4865                          ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
 4866                          ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
 4867                          ;*GO TO THAT ROUTINE.
 4868
 4869  024256  010046          $TRAP:  MOV     R0,-(SP)        ;;SAVE R0
 4870  024260  016600  000002          MOV     2(SP),R0        ;;GET TRAP ADDRESS
 4871  024264  005740                  TST     -(R0)           ;;BACKUP BY 2
 4872  024266  111000                  MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
 4873  024270  022700  000030          CMP     #$TERM,R0       ;;CHECK FOR OUT OF BOUNDS
 4874  024274  003002                  BGT     .+6             ;;BR IF OK
 4875  024276  000000                  HALT                    ;;OUT OF BOUNDS
 4876  024300  000776                  BR      .-2             ;;HANGUP
 4877  024302  006300                  ASL     R0              ;;POSITION FOR INDEXING
 4878  024304  016000  024324          MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
 4879  024310  000200                  RTS     R0              ;;GO TO ROUTINE
 4880
 4881
 4882                          ;;THIS IS USE TO HANDLE THE "GETPRI" MACRO
 4883
 4884  024312  011646          $TRAP2: MOV     (SP),-(SP)      ;;MOVE THE PC DOWN
 4885  024314  016666  000004  000002          MOV     4(SP),2(SP)     ;;MOVE THE PSW DOWN
 4886  024322  000002                  RTI                     ;;RESTORE THE PSW
 4887
 4888                          .SBTTL  TRAP TABLE
 4889
 4890                          ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
 4891                          ;*BY THE "TRAP" INSTRUCTION.
 4892
 4893                          ;       ROUTINE
 4894                          ;       -------
 4895  024324  024312          $TRPAD: .WORD   $TRAP2
```

```
 4896  024326  023312                    $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
 4897  024330  024054                    $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
 4898  024332  024030                    $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
 4899  024334  024070                    $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)
 4900  024336  023604                    $TYPDS  ;;CALL=TYPDS    TRAP+5(104405)  TYPE DECIMAL NUMBER (WITH SIGN)
 4901
 4902  024340  022250                    $GTSWR  ;;CALL=GTSWR    TRAP+6(104406)  GET SOFT-SWR SETTING
 4903
 4904  024342  022160                    $CKSWR  ;;CALL=CKSWR    TRAP+7(104407)  TEST FOR CHANGE IN SOFT-SWR
 4905  024344  022522                    $RDCHR  ;;CALL=RDCHR    TRAP+10(104410) TTY TYPEIN CHARACTER ROUTINE
 4906  024346  022612                    $RDLIN  ;;CALL=RDLIN    TRAP+11(104411) TTY TYPEIN STRING ROUTINE
 4907  024350  021504                    $RDOCT  ;;CALL=RDOCT    TRAP+12(104412) READ AN OCTAL NUMBER FROM TTY
 4908  024352  023134                    $RDDEC  ;;CALL=RDDEC    TRAP+13(104413) READ A DECIMAL NUMBER FROM TTY
 4909          000030          $TERM=.-$TRPAD
 4910                          ;ROUTINE USED TO LOAD OR MODIFY THE KMC11 PARAMETER STATUS BLOCKS.
 4911                          ;TWO ENTRY POINTS ARE USED, ONE AS THE INITIAL START-UP AND THE
 4912                          ;SECOND AS THE MODIFY TABLE ROUTINE POINT.
 4913                          ;WHEN INITIALLY ENTERED FROM THE MONITOR ROUTINE THE FIRST
 4914                          ;PARAMETER BLOCKS STATUS IS INVOLKED FROM THE CONSOLE TO
 4915                          ;WHICH THE OPERATOR MUST INPUT THE FIRST DEVICE ADDRESS INTERRUPT
 4916                          ;VECTOR, PRIORITY AND WHETHER THE DEVICE IS TO BE ENABLED OR
 4917                          ;DISABLED.  AFTER THE FIRST KMC11 IS SPECIFIED THE ROUTINE
 4918                          ;ENTERS THE CONFIGURE MODE AS SPECIFIED BY THE ASTERISK (*)
 4919                          ;THE OPERATOR THEN HAS THE FOLLOWING CHOICES OF RESPONSE:
 4920                          ;
 4921                          ;X NB = INCLUDE INTERRUPT VEC. + PRI.
 4922                          ;       *M#     ;#=1->16., OPENS THE PARAMETER BLOCK AND INVOLKS
 4923                          ;               ;THE CHANGE OF STATUS (AFTER INPUTTING STATUS
 4924                          ;               ;THIS THEN IS LAST BLOCK OPEN)
 4925                          ;
 4926                          ;
 4927                          ;       *A (CR) ;FILLS REMAINDER OF TABLE WITH SUCCESIVE DEV ADR + KINT VEC
 4928                          ;               ;AND IDENTICAL STATUS AS/PER LAST (THE LAST STATUS BLOCK
 4929                          ;               ;ENTERED) *NOTE IF ISSUED AS FIRST COMMAND IN 'MODIFY
 4930                          ;               ;MODE THE TABLE IS FILLED AS/THE FIRST KMC11.
 4931                          ;
 4932                          ;       *E (CR) ;EXITS TO THE CALLING ROUTINE I.E. (MONITOR)
 4933                          ;
 4934                          ;
 4935  024354  000000          KMCNT:  0                       ;# OF KMC11'S ENABLED
 4936  024356  000000          CONFIG: 0
 4937  024360  000000          CURTAB: 0                       ;CURRENT BLOCK OPEN
 4938  024362  012701  026244  SETTAB: MOV     #KMCTAB,R1      ;POINT TO PARAMETER TABLE-BLOCK 1
 4939  024366  005021          1$:     CLR     (R1)+           ;CLEAN THE MESS
 4940  024370  020127  026504          CMP     R1,#KMCTBE      ;DONE?
 4941  024374  001374                  BNE     1$              ;BR=N
 4942  024376  012701  026244          MOV     #KMCTAB,R1
 4943  024402  010137  024360          MOV     R1,CURTAB
 4944  024406  000137  024452          JMP     PT
 4945                          ;MODIFY TABLE ROUTINE ENTRY POINT
 4946  024412                  NOTR:
 4947  024412  104401  024420          TYPE    ,64$            ;;TYPE ASCIZ STRING
 4948  024416  000402                  BR      MODTAB          ;;GET OVER THE ASCIZ
 4949                          ;;64$:  .ASCIZ  /??/
 4950  024424                  MODTAB:
 4951  024424  005737  024356  MODTAB: TST     CONFIG          ;FIRST TIME?
```

```
4952  024430  001002                        BNE     1$                      ;BR=NO
4953  024432  000137  024362                JMP     SETTAB
4954  024436                        1$:
4955  024436  104401  024444                TYPE    ,65$                    ;;TYPE ASCIZ STRING
4956  024442  000402                        BR      64$                     ;;GET OVER THE ASCIZ
4957                                ;;65$:  .ASCIZ  <15><12>/*/
4958  024450                        64$:
4959  024450  000401                        BR      PT+2
4960  024452  000570                PT:     BR      5$                      ;GET FIRST SETUP
4961  024454  104410                        RDCHR
4962  024456  011637  002320                MOV     (SP),CHRADR             ;ECHO
4963  024462  104401  002320                TYPE    ,CHRADR
4964  024466  022726  000115                CMP     #115,(SP)+              ;IS IT A M?
4965  024472  001436                        BEQ     25$                     ;BR=YES
4966  024474  022746  000101                CMP     #101,-(SP)              ;IS IT AN A?
4967  024500  001002                        BNE     111$
4968  024502  000137  026174                JMP     12$
4969  024506  122726  000105        111$:   CMPB    #105,(SP)+              ;IS IT AN E?
4970  024512  001407                        BEQ     113$                    ;B=Y GO!
4971  024514  022746  000123                CMP     #'S,-(SP)               ;AN S?
4972  024520  001402                        BEQ     112$                    ;B=YES
4973  024522  005726                        TST     (SP)+                   ;NO TRY AGAIN
4974  024524  000732                        BR      NOTR
4975  024526  005726                112$:   TST     (SP)+
4976  024530  000404                        BR      1$                      ;NEXT COMMAND
4977                                        ;FIND # OF KMC11'S ACTIVE AND STORE IN 'KMCATV'
4978  024532  005037  024354        113$:   CLR     KMCNT
4979  024536  012701  026244                MOV     #KMCTAB,R1
4980  024542  005761  000002        1$:     TST     2(R1)
4981  024546  100002                        BPL     2$                      ;BR=NO
4982  024550  005237  024354                INC     KMCNT                   ;YES
4983  024554  062701  000012        2$:     ADD     #12,R1
4984  024560  020127  026504                CMP     R1,#KMCTBE              ;DONE?
4985  024564  001366                        BNE     1$                      ;B=N
4986  024566  000207                        RTS     PC                      ;YES
4987
4988                                        ;A 'M' HAS BEEN TYPED READ THE DECIMAL # FOLLOWING
4989  024570                        25$:
4990  024570  104413                        RDDEC
4991  024572  012600                        MOV     (SP)+,R0                ;IS # +?
4992  024574  010037  002456                MOV     R0,CUNIT                ;PRINT LINE UNIT #
4993  024600  010001                        MOV     R0,R1
4994  024602  003703                        BLE     NOTR
4995  024604  120027  000020                CMPB    R0,#16.                 ;IS #<16.?
4996  024610  003300                        BGT     NOTR                    ;BR=NO
4997  024612  000241                        CLC
4998  024614  006100                        ROL     R0                      ;FORM OFFSET INTO 'KMCTAB'
4999  024616  010002                        MOV     R0,R2                   ;  R0 = 2 X LINE NUMBER
5000  024620  006102                        ROL     R2
5001  024622  006102                        ROL     R2                      ;  R2 = 8 X LINE NUMBER
5002  024624  060200                        ADD     R2,R0                   ;  OFFSET = 12(OCTAL) X LINE NUMBER
5003  024626  062700  026232                ADD     #KMCTAB-12,R0
5004  024632  010037  024360                MOV     R0,CURTAB
5005  024636  104401  024644                TYPE    ,65$                    ;;TYPE ASCIZ STRING
5006  024642  000443                        BR      64$                     ;;GET OVER THE ASCIZ
5007                                ;;65$:  .ASCIZ  <15><12>!(DEV.ADR.)  (ENABLE)  (CRC32-MODE) (EX/IN-VEC) (LINES-PRI)   UN
```

```
 5008  024752                          64$:
 5009
 5010                                          ;ROUTINE TO DISPLAY CONTENTS OF CURRENT BLOCK
 5011  024752                          3$:
 5012  024752  104401  024760                  TYPE    ,67$            ;;TYPE ASCIZ STRING
 5013  024756  000402                  BR      66$             ;;GET OVER THE ASCIZ
 5014                                  ;;67$:  .ASCIZ  <15><12>/ /
 5015  024764                          66$:
 5016  024764  012703  000005          MOV     #5,R3
 5017  024770  012046                  4$:     MOV     (R0)+,-(SP)
 5018  024772  104403                  TYPOS
 5019  024774     006                  .BYTE   6
 5020  024775     001                  .BYTE   1               ;NO SUPPRESS
 5021  024776  104401  025004          TYPE    ,69$            ;;TYPE ASCIZ STRING
 5022  025002  000404                  BR      68$             ;;GET OVER THE ASCIZ
 5023                                  ;;69$:  .ASCIZ  /       /
 5024  025014                          68$:
 5025  025014  005303                  DEC     R3
 5026  025016  001401                  BEQ     45$
 5027  025020  000763                  BR      4$
 5028  025022  013746  002456          45$:    MOV     CUNIT,-(SP)
 5029  025026  104405                  TYPDS
 5030  025030  013701  024360          MOV     CURTAB,R1
 5031
 5032  025034                          5$:     ;ROUTINE TO MODIFY PARAMETER BLOCK
 5033
 5034  025034  104401  025042          TYPE    ,71$            ;;TYPE ASCIZ STRING
 5035  025040  000407                  BR      70$             ;;GET OVER THE ASCIZ
 5036                                  ;;71$:  .ASCIZ  <15><12>/DEV.ADR.= /
 5037  025060                          70$:
 5038  025060  004737  026070          JSR     PC,8$
 5039  025064  104401  025072          TYPE    ,73$            ;;TYPE ASCIZ STRING
 5040  025070  000413                  BR      72$             ;;GET OVER THE ASCIZ
 5041                                  ;;73$:  .ASCIZ  /(1)ENABLE(0)DISABLE /
 5042  025120                          72$:
 5043  025120  004737  026104          JSR     PC,10$
 5044  025124  005201                  INC     R1              ;BYPASS UNUSED BYTE
 5045  025126  104401  025134          TYPE    ,75$            ;;TYPE ASCIZ STRING
 5046  025132  000411                  BR      74$             ;;GET OVER THE ASCIZ
 5047                                  ;;75$:  .ASCIZ  <15><12>/(1)BOP (0)CCP /
 5048  025156                          74$:
 5049  025156  004737  026104          JSR     PC,10$
 5050  025162  105741                  TSTB    -(R1)           ;CHECK FOR CCP MODE
 5051  025164  100023                  BPL     116$            ;IF YES, SKIP NEXT ENTRY
 5052  025166  005201                  INC     R1              ;RESTORE TABLE POINTER
 5053  025170  104401  025176          TYPE    ,77$            ;;TYPE ASCIZ STRING
 5054  025174  000414                  BR      76$             ;;GET OVER THE ASCIZ
 5055                                  ;;77$:  .ASCIZ  <15><12>/(1)CRC-32 (0)NO CRC /
 5056  025226                          76$:
 5057  025226  004737  026104          JSR     PC,10$
 5058  025232  000402                  BR      117$            ;CONT. TO NEXT ENTRY
 5059  025234  005201                  116$:   INC     R1              ;RESTORE TABLE POINTER
 5060  025236  105021                  CLRB    (R1)+           ;IF CCP, SKIP CRC ENTRY; BUT UPDATE POINTER
 5061
 5062  025240                          117$:
 5063  025240  104401  025246          TYPE    ,79$            ;;TYPE ASCIZ STRING
```

```
5064  025244  000410                        BR      78$             ;;GET OVER THE ASCIZ
5065                                ;;79$:    .ASCIZ  <15><12>/DEV.VECTOR= /
5066  025266                        78$:
5067  025266  004737  026022                JSR     PC,7$
5068  025272                        118$:
5069  025272  104401  025300                TYPE    ,81$            ;;TYPE ASCIZ STRING
5070  025276  000410                        BR      80$             ;;GET OVER THE ASCIZ
5071                                ;;81$:    .ASCIZ  /(1)EXT.(0)INT. /
5072  025320                        80$:
5073  025320  004737  026104                JSR     PC,10$
5074  025324  105741                103$:   TSTB    -(R1)                   ;IF INTTERNAL OVERRIDE CRC32
5075  025326  100432                        BMI     104$                    ;B=EXTERNAL
5076  025330  105761  177775                TSTB    -3(R1)          ;BOP MODE??
5077  025334  001427                        BEQ     104$            ;B=NO
5078  025336  105761  177776                TSTB    -2(R1)          ;CRC-32 ENABLED?
5079  025342  001424                        BEQ     104$            ;B=NO
5080  025344  105061  177776                CLRB    -2(R1)                  ;OVERRIDE CRC32
5081  025350  104401  025356                TYPE    ,83$            ;;TYPE ASCIZ STRING
5082  025354  000417                        BR      82$             ;;GET OVER THE ASCIZ
5083                                ;;83$:    .ASCIZ  /  (WARNING) NO CRC-32 TESTING/
5084  025414                        82$:
5085  025414  105721                104$:   TSTB    (R1)+                   ;RESTORE R1
5086  025416  104401  025424                TYPE    ,85$            ;;TYPE ASCIZ STRING
5087  025422  000411                        BR      84$             ;;GET OVER THE ASCIZ
5088                                ;;85$:    .ASCIZ  <15><12>/INT.PRI.(4-7)= /
5089  025446                        84$:
5090  025446  104412                        RDOCT
5091  025450  105766  000001                TSTB    1(SP)           ;HIGH BYTE=0?
5092  025454  001053                        BNE     137$            ;B=NO
5093  025456  012600                        MOV     (SP)+,R0
5094  025460  001411                        BEQ     136$            ;B=NO CHANGE
5095  025462  042700  177760                BIC     #177760,R0      ;SAVE LOW BYTE
5096  025466  122700  000010                CMPB    #10,R0          ;LEGAL #?
5097  025472  003445                        BLE     138$            ;B=N
5098  025474  122700  000003                CMPB    #3,R0
5099  025500  002042                        BGE     138$            ;B=NOT LEGAL
5100  025502  110011                        MOVB    R0,(R1)         ;STORE THE PRIORITY
5101  025504  105721                136$:   TSTB    (R1)+
5102  025506  104401  025514                TYPE    ,87$            ;;TYPE ASCIZ STRING
5103  025512  000425                        BR      86$             ;;GET OVER THE ASCIZ
5104                                ;;87$:    .ASCIZ  /LINES(0-7)(I.E.,#,#,#) OR (A)ALL(N)NONE /
5105  025566                        86$:
5106  025566  004737  025620                JSR     PC,6$
5107  025572  012737  177777  024356        MOV     #-1,CONFIG
5108  025600  000137  024424                JMP     MODTAB
5109  025604  005726                137$:   TST     (SP)+           ;POP STACK
5110  025606  104401  001177        138$:   TYPE    ,$CRLF
5111  025612  104401  001176                TYPE    ,$QUES
5112  025616  000676                        BR      104$
5113  025620  104411                6$:     RDLIN
5114  025622  012600                        MOV     (SP)+,R0        ;GET TTY BUFFER
5115  025624  105710                        TSTB    (R0)            ;ANY CHANGE IN STATUS?
5116  025626  001473                        BEQ     110$            ;B=NO
5117  025630  112711  177777                MOVB    #-1,(R1)        ;SET TO ALL LINES ENABLED
5118  025634  122710  000101                CMPB    #'A,(R0)        ;TEST FOR ALL LINES
5119  025640  001466                        BEQ     110$            ;B=ENABLE ALL LINES
```

```
5120  025642  105011                          CLRB    (R1)            ;SET TO NO LINES
5121  025644  122710  000116                  CMPB    #'N,(R0)        ;IT IT N FOR NO LINES
5122  025650  001462                          BEQ     110$            ;B=YES NO LINES ENABLED
5123  025652  112037  001160          107$:   MOVB    (R0)+,$TMP0     ;DONE?
5124  025656  001457                          BEQ     110$            ;B=YES
5125  025660  122737  000054  001160          CMPB    #54,$TMP0       ;A COMMA?
5126  025666  001771                          BEQ     107$            ;B=YES (ONLY A SEPARATOR)
5127  025670  123727  001160  000060          CMPB    $TMP0,#60       ;ONLY 0-7 ARE VALID
5128  025676  002423                          BLT     130$            ;B=NOT VALID
5129  025700  123727  001160  000067          CMPB    $TMP0,#67       ;LESS THAN 7?
5130  025706  003017                          BGT     130$            ;B=NOT VALID
5131  025710  142737  000360  001160          BICB    #360,$TMP0      ;SAVE ONLY OCTAL DIGIT
5132  025716  105237  001160                  INCB    $TMP0
5133  025722  012702  000200                  MOV     #200,R2         ;INIT MASKING BIT
5134  025726  105337  001160          108$:   DECB    $TMP0           ;FIND BIT POSITION OF ENABLED LINE
5135  025732  001403                          BEQ     109$            ;B=FOUND IT
5136  025734  006202                          ASR     R2              ;NEXT LINE BIT
5137  025736  001373                          BNE     108$
5138  025740  000402                          BR      130$            ;INVALID CHAR.
5139  025742  150211                  109$:   BISB    R2,(R1)         ;SET BIT FOUND (THIS LINE ENABLED)
5140  025744  000742                          BR      107$            ;TRY AGAIN
5141  025746                          130$:
5142  025746  104401  025754                  TYPE    ,89$            ;;TYPE ASCIZ STRING
5143  025752  000417                          BR      88$             ;;GET OVER THE ASCIZ
5144                                  ;;89$:   .ASCIZ  /<15><12>SYNTAX ERROR<15><12>/
5145  026012                          88$:
5146  026012  000137  025620                  JMP     6$              ;TRY AGAIN
5147  026016  005201                  110$:   INC     R1              ;MOV TO NEXT BYTE
5148  026020  000207                          RTS     PC              ; & RETURN TO MAINLINE
5149  026022  104412                  7$:     RDOCT
5150  026024  012600                          MOV     (SP)+,R0
5151  026026  042700  176000                  BIC     #176000,R0      ;SAVE ONLY VECTOR
5152  026032  001405                          BEQ     131$            ;B=NO CHANGE
5153  026034  011103                          MOV     (R1),R3         ;SAVE ONLY E/I BIT
5154  026036  042703  077777                  BIC     #077777,R3      ;STRIP OLD VECTOR
5155  026042  050300                          BIS     R3,R0           ;RETURN E/I BIT
5156  026044  010011                          MOV     R0,(R1)         ;STORE NEW DATA
5157  026046  062701  000001          131$:   ADD     #1,R1
5158  026052  000207                          RTS     PC
5159  026054  005726                  132$:   TST     (SP)+           ;POP STACK
5160  026056  104401  001176                  TYPE    ,$QUES  ;HIGH BYTE NOT =0
5161  026062  104401  001177                  TYPE    ,$CRLF
5162  026066  000755                          BR      7$
5163  026070  104412                  8$:     RDOCT
5164  026072  012600                          MOV     (SP)+,R0        ;CHANGE STATUS?
5165  026074  001401                          BEQ     9$              ;B=NO
5166  026076  010011                          MOV     R0,(R1)         ;LOAD DATA
5167  026100  005721                  9$:     TST     (R1)+
5168  026102  000207                          RTS     PC
5169                                  ;91$:    RDOCT
5170                                  ;        MOV     (SP)+,R0        ;STATUS CHANGE?
5171                                  ;        BEQ     92$             ;B=NO
5172                                  ;        MOVB    R0,(R1)         ;LOAD DATA
5173                                  ;92$:    TSTB    (R1)+
5174                                  ;        RTS     PC
5175  026104  104410                  10$:    RDCHR
```

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5176  026106  012600                          MOV     (SP)+,R0
5177  026110  122700  000015                  CMPB    #15,R0          ;C.R.?
5178  026114  001425                          BEQ     114$
5179  026116  110037  002320                  MOVB    R0,CHRADR
5180  026122  104401  002320                  TYPE    ,CHRADR
5181  026126  122700  000060                  CMPB    #60,R0          ;0?
5182  026132  001413                          BEQ     11$
5183  026134  122700  000061                  CMPB    #61,R0          ;1?
5184  026140  001405                          BEQ     105$
5185  026142  104401  026150                  TYPE    ,91$            ;;TYPE ASCIZ STRING
5186  026146  000401                          BR      90$             ;;GET OVER THE ASCIZ
5187                                  ;;91$:  .ASCIZ  /?/
5188  026152                          90$:
5189  026152  000754                          BR      10$
5190  026154  152721  000200          105$:   BISB    #200,(R1)+
5191  026160  000404                          BR      115$
5192  026162  142721  000200          11$:    BICB    #200,(R1)+
5193  026166  000401                          BR      115$
5194  026170  005201                  114$:   INC     R1
5195  026172  000207                  115$:   RTS     PC
5196                                          ;AN "A" WAS DETECTED SET REMAINING BLOCKS WITH SUCCESSIVE
5197                                          ;PARAMETERS (BASED) AS LAST BLOCK OPEN "CURTAB".
5198
5199  026174  005726                  12$:    TST     (SP)+
5200  026176  013700  024360                  MOV     CURTAB,R0       ;GET CURRENT BLOCK
5201  026202                          125$:
5202  026202  010001                          MOV     R0,R1
5203  026204  062701  000012                  ADD     #12,R1
5204  026210  020127  026504          13$:    CMP     R1,#KMCTBE      ;AT END?
5205  026214  002010                          BGE     14$             ;B=Y
5206  026216  012021                          MOV     (R0)+,(R1)+     ;GET NEW D.A.
5207  026220  012021                          MOV     (R0)+,(R1)+     ;LOAD ENABLE
5208  026222  012021                          MOV     (R0)+,(R1)+     ;LOAD MODE, CRC32 STATUS
5209  026224  012021                          MOV     (R0)+,(R1)+     ;LOAD VECTOR, E/I STATUS
5210  026226  012021                          MOV     (R0)+,(R1)+     ;SAME PRIORITY AND LINE BYTE
5211  026230  010037  024360                  MOV     R0,CURTAB
5212  026234  000762                          BR      125$
5213
5214  026236  000137  024424          14$:    JMP     MODTAB
5215  026242  000000                  15$:    0
5216                                          ;KMC11 PARAMETER BLOCKS
5217
5218  026244                          KMCTAB:
5219                                          ;PARAMETER BLOCK FOR KMC#01
5220  026244  000000                          KMCR01: 0       ;CONTROL + STATUS REGISTER FOR KMC11 #01
5221  026246  000000                          KMCE01: 0       ;LO BYTE=ENABLE (200=YES,0=NO);HI BYTE UNUSED
5222  026250  000000                          KMCV01: 0       ;LO BYTE=MODE (200=BOP,0=CCP) HI BYTE=CRC32(200=YES,0=NO)
5223  026252  000000                          KMCP01: 0       ;LO BYTE=INT.VECTOR ADDR.,HI=E/I(200=EXT 0=INT)
5224  026254  000000                          KMCS01: 0       ;LO BYTE=INT.PRI. HI BYTE=LINE BYTE
5225                                          ;PARAMETER BLOCK FOR KMC#02
5226  026256  000000                          KMCR02: 0       ;CONTROL + STATUS REGISTER FOR KMC11 #02
5227  026260  000000                          KMCE02: 0       ;LO BYTE=ENABLE (200=YES,0=NO);HI BYTE UNUSED
5228  026262  000000                          KMCV02: 0       ;LO BYTE=MODE (200=BOP,0=CCP) HI BYTE=CRC32(200=YES,0=NO)
5229  026264  000000                          KMCP02: 0       ;LO BYTE=INT.VECTOR ADDR.,HI=E/I(200=EXT 0=INT)
5230  026266  000000                          KMCS02: 0       ;LO BYTE=INT.PRI. HI BYTE=LINE BYTE
5231                                          ;PARAMETER BLOCK FOR KMC#03
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5232  026270  000000                KMCR03: 0       ;CONTROL + STATUS REGISTER FOR KMC11 #03
5233  026272  000000                KMCE03: 0       ;LO BYTE=ENABLE (200=YES,0=NO);HI BYTE UNUSED
5234  026274  000000                KMCV03: 0       ;LO BYTE=MODE (200=BOP,0=CCP) HI BYTE=CRC32(200=YES,0=NO)
5235  026276  000000                KMCP03: 0       ;LO BYTE=INT.VECTOR ADDR.,HI=E/I(200=EXT 0=INT)
5236  026300  000000                KMCS03: 0       ;LO BYTE=INT.PRI. HI BYTE=LINE BYTE
5237                                ;PARAMETER BLOCK FOR KMC#04
5238  026302  000000                KMCR04: 0       ;CONTROL + STATUS REGISTER FOR KMC11 #04
5239  026304  000000                KMCE04: 0       ;LO BYTE=ENABLE (200=YES,0=NO);HI BYTE UNUSED
5240  026306  000000                KMCV04: 0       ;LO BYTE=MODE (200=BOP,0=CCP) HI BYTE=CRC32(200=YES,0=NO)
5241  026310  000000                KMCP04: 0       ;LO BYTE=INT.VECTOR ADDR.,HI=E/I(200=EXT 0=INT)
5242  026312  000000                KMCS04: 0       ;LO BYTE=INT.PRI. HI BYTE=LINE BYTE
5243                                ;PARAMETER BLOCK FOR KMC#05
5244  026314  000000                KMCR05: 0       ;CONTROL + STATUS REGISTER FOR KMC11 #05
5245  026316  000000                KMCE05: 0       ;LO BYTE=ENABLE (200=YES,0=NO);HI BYTE UNUSED
5246  026320  000000                KMCV05: 0       ;LO BYTE=MODE (200=BOP,0=CCP) HI BYTE=CRC32(200=YES,0=NO)
5247  026322  000000                KMCP05: 0       ;LO BYTE=INT.VECTOR ADDR.,HI=E/I(200=EXT 0=INT)
5248  026324  000000                KMCS05: 0       ;LO BYTE=INT.PRI. HI BYTE=LINE BYTE
5249                                ;PARAMETER BLOCK FOR KMC#06
5250  026326  000000                KMCR06: 0       ;CONTROL + STATUS REGISTER FOR KMC11 #06
5251  026330  000000                KMCE06: 0       ;LO BYTE=ENABLE (200=YES,0=NO);HI BYTE UNUSED
5252  026332  000000                KMCV06: 0       ;LO BYTE=MODE (200=BOP,0=CCP) HI BYTE=CRC32(200=YES,0=NO)
5253  026334  000000                KMCP06: 0       ;LO BYTE=INT.VECTOR ADDR.,HI=E/I(200=EXT 0=INT)
5254  026336  000000                KMCS06: 0       ;LO BYTE=INT.PRI. HI BYTE=LINE BYTE
5255                                ;PARAMETER BLOCK FOR KMC#07
5256  026340  000000                KMCR07: 0       ;CONTROL + STATUS REGISTER FOR KMC11 #07
5257  026342  000000                KMCE07: 0       ;LO BYTE=ENABLE (200=YES,0=NO);HI BYTE UNUSED
5258  026344  000000                KMCV07: 0       ;LO BYTE=MODE (200=BOP,0=CCP) HI BYTE=CRC32(200=YES,0=NO)
5259  026346  000000                KMCP07: 0       ;LO BYTE=INT.VECTOR ADDR.,HI=E/I(200=EXT 0=INT)
5260  026350  000000                KMCS07: 0       ;LO BYTE=INT.PRI. HI BYTE=LINE BYTE
5261                                ;PARAMETER BLOCK FOR KMC#08
5262  026352  000000                KMCR08: 0       ;CONTROL + STATUS REGISTER FOR KMC11 #08
5263  026354  000000                KMCE08: 0       ;LO BYTE=ENABLE (200=YES,0=NO);HI BYTE UNUSED
5264  026356  000000                KMCV08: 0       ;LO BYTE=MODE (200=BOP,0=CCP) HI BYTE=CRC32(200=YES,0=NO)
5265  026360  000000                KMCP08: 0       ;LO BYTE=INT.VECTOR ADDR.,HI=E/I(200=EXT 0=INT)
5266  026362  000000                KMCS08: 0       ;LO BYTE=INT.PRI. HI BYTE=LINE BYTE
5267                                ;PARAMETER BLOCK FOR KMC#09
5268  026364  000000                KMCR09: 0       ;CONTROL + STATUS REGISTER FOR KMC11 #09
5269  026366  000000                KMCE09: 0       ;LO BYTE=ENABLE (200=YES,0=NO);HI BYTE UNUSED
5270  026370  000000                KMCV09: 0       ;LO BYTE=MODE (200=BOP,0=CCP) HI BYTE=CRC32(200=YES,0=NO)
5271  026372  000000                KMCP09: 0       ;LO BYTE=INT.VECTOR ADDR.,HI=E/I(200=EXT 0=INT)
5272  026374  000000                KMCS09: 0       ;LO BYTE=INT.PRI. HI BYTE=LINE BYTE
5273                                ;PARAMETER BLOCK FOR KMC#10
5274  026376  000000                KMCR10: 0       ;CONTROL + STATUS REGISTER FOR KMC11 #10
5275  026400  000000                KMCE10: 0       ;LO BYTE=ENABLE (200=YES,0=NO);HI BYTE UNUSED
5276  026402  000000                KMCV10: 0       ;LO BYTE=MODE (200=BOP,0=CCP) HI BYTE=CRC32(200=YES,0=NO)
5277  026404  000000                KMCP10: 0       ;LO BYTE=INT.VECTOR ADDR.,HI=E/I(200=EXT 0=INT)
5278  026406  000000                KMCS10: 0       ;LO BYTE=INT.PRI. HI BYTE=LINE BYTE
5279                                ;PARAMETER BLOCK FOR KMC#11
5280  026410  000000                KMCR11: 0       ;CONTROL + STATUS REGISTER FOR KMC11 #11
5281  026412  000000                KMCE11: 0       ;LO BYTE=ENABLE (200=YES,0=NO);HI BYTE UNUSED
5282  026414  000000                KMCV11: 0       ;LO BYTE=MODE (200=BOP,0=CCP) HI BYTE=CRC32(200=YES,0=NO)
5283  026416  000000                KMCP11: 0       ;LO BYTE=INT.VECTOR ADDR.,HI=E/I(200=EXT 0=INT)
5284  026420  000000                KMCS11: 0       ;LO BYTE=INT.PRI. HI BYTE=LINE BYTE
5285                                ;PARAMETER BLOCK FOR KMC#12
5286  026422  000000                KMCR12: 0       ;CONTROL + STATUS REGISTER FOR KMC11 #12
5287  026424  000000                KMCE12: 0       ;LO BYTE=ENABLE (200=YES,0=NO);HI BYTE UNUSED
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 5288  026426  000000                    KMCV12: 0       ;LO BYTE=MODE (200=BOP,0=CCP) HI BYTE=CRC32(200=YES,0=NO)
 5289  026430  000000                    KMCP12: 0       ;LO BYTE=INT.VECTOR ADDR.,HI=E/I(200=EXT 0=INT)
 5290  026432  000000                    KMCS12: 0       ;LO BYTE=INT.PRI. HI BYTE=LINE BYTE
 5291                                    ;PARAMETER BLOCK FOR KMC#13
 5292  026434  000000                    KMCR13: 0       ;CONTROL + STATUS REGISTER FOR KMC11 #13
 5293  026436  000000                    KMCE13: 0       ;LO BYTE=ENABLE (200=YES,0=NO);HI BYTE UNUSED
 5294  026440  000000                    KMCV13: 0       ;LO BYTE=MODE (200=BOP,0=CCP) HI BYTE=CRC32(200=YES,0=NO)
 5295  026442  000000                    KMCP13: 0       ;LO BYTE=INT.VECTOR ADDR.,HI=E/I(200=EXT 0=INT)
 5296  026444  000000                    KMCS13: 0       ;LO BYTE=INT.PRI. HI BYTE=LINE BYTE
 5297                                    ;PARAMETER BLOCK FOR KMC#14
 5298  026446  000000                    KMCR14: 0       ;CONTROL + STATUS REGISTER FOR KMC11 #14
 5299  026450  000000                    KMCE14: 0       ;LO BYTE=ENABLE (200=YES,0=NO);HI BYTE UNUSED
 5300  026452  000000                    KMCV14: 0       ;LO BYTE=MODE (200=BOP,0=CCP) HI BYTE=CRC32(200=YES,0=NO)
 5301  026454  000000                    KMCP14: 0       ;LO BYTE=INT.VECTOR ADDR.,HI=E/I(200=EXT 0=INT)
 5302  026456  000000                    KMCS14: 0       ;LO BYTE=INT.PRI. HI BYTE=LINE BYTE
 5303                                    ;PARAMETER BLOCK FOR KMC#15
 5304  026460  000000                    KMCR15: 0       ;CONTROL + STATUS REGISTER FOR KMC11 #15
 5305  026462  000000                    KMCE15: 0       ;LO BYTE=ENABLE (200=YES,0=NO);HI BYTE UNUSED
 5306  026464  000000                    KMCV15: 0       ;LO BYTE=MODE (200=BOP,0=CCP) HI BYTE=CRC32(200=YES,0=NO)
 5307  026466  000000                    KMCP15: 0       ;LO BYTE=INT.VECTOR ADDR.,HI=E/I(200=EXT 0=INT)
 5308  026470  000000                    KMCS15: 0       ;LO BYTE=INT.PRI. HI BYTE=LINE BYTE
 5309                                    ;PARAMETER BLOCK FOR KMC#16
 5310  026472  000000                    KMCR16: 0       ;CONTROL + STATUS REGISTER FOR KMC11 #16
 5311  026474  000000                    KMCE16: 0       ;LO BYTE=ENABLE (200=YES,0=NO);HI BYTE UNUSED
 5312  026476  000000                    KMCV16: 0       ;LO BYTE=MODE (200=BOP,0=CCP) HI BYTE=CRC32(200=YES,0=NO)
 5313  026500  000000                    KMCP16: 0       ;LO BYTE=INT.VECTOR ADDR.,HI=E/I(200=EXT 0=INT)
 5314  026502  000000                    KMCS16: 0       ;LO BYTE=INT.PRI. HI BYTE=LINE BYTE
 5315
 5316  026504  000000              KMCTBE: 0
 5317
 5318  026506  013701  024360      GETKMC: MOV     CURTAB,R1       ;GET CURRENT TABLE POINTER
 5319  026512  062701  000012      1$:     ADD     #12,R1
 5320  026516  020127  026504              CMP     R1,#KMCS16+2    ;@ END OF TABLE?
 5321  026522  001004                      BNE     2$              ;B=NO
 5322  026524  012737  026232  024360      MOV     #KMCTAB-12,CURTAB
 5323  026532  000207                      RTS     PC
 5324  026534  105761  000002      2$:     TSTB    2(R1)   ;ENABLED?
 5325  026540  100364                      BPL     1$              ;B=NO
 5326  026542  010137  024360              MOV     R1,CURTAB       ;NOW POINTING TO CURRENT KMC
 5327  026546  012702  002260              MOV     #SEL0,R2        ;POINT TO DEVICE REGISTER POINTERS
 5328  026552  012104                      MOV     (R1)+,R4        ;GET KMC CSR0
 5329  026554  012705  000010              MOV     #8.,R5          ;8 REGISTERS
 5330  026560  010422              25$:    MOV     R4,(R2)+
 5331  026562  005204                      INC     R4
 5332  026564  005305                      DEC     R5
 5333  026566  001374                      BNE     25$             ;BR=NO
 5334  026570  062701  000002              ADD     #2,R1           ;SKIP ENABLE ENTRY
 5335                                    ;LOAD THE MODE
 5336  026574  112137  002311              MOVB    (R1)+,MODE
 5337  026600  112137  002314              MOVB    (R1)+,CRC32F    ;LOAD CRC-32 STATUS
 5338                                    ;LOAD VECTOR ADDRESSES
 5339  026604  011112                      MOV     (R1),(R2)       ;LOAD INPUT VECTOR
 5340  026606  042722  100000              BIC     #100000,(R2)+           ;NEXT WORD & CLR JUNK
 5341  026612  011112                      MOV     (R1),(R2)       ;LOAD OUTPUT VECTOR
 5342  026614  062712  000004              ADD     #4,(R2)         ;+4=OUTPUT VECTOR ADDR.
 5343  026620  042722  100000              BIC     #100000,(R2)+   ;STRIP E/I BIT
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5344  026624  105721                          TSTB    (R1)+           ;NEXT BYTE
5345  026626  012737  000200  002316          MOV     #200,CLKDAT     ;INT. + CLK
5346  026634  105721                          TSTB    (R1)+           ;INT?
5347  026636  100003                          BPL     26$             ;B=YES
5348  026640  042737  000200  002316          BIC     #200,CLKDAT     ;MAKE IT EXT.
5349  026646                          26$:
5350  026646  112112                          MOVB    (R1)+,(R2)      ;INPUT PRIORITY
5351  026650  106112                          ROLB    (R2)            ;MAKE SAME AS P.S.WORD
5352  026652  106112                          ROLB    (R2)
5353  026654  106112                          ROLB    (R2)
5354  026656  106112                          ROLB    (R2)
5355  026660  106112                          ROLB    (R2)
5356  026662  162712  000040                  SUB     #40,(R2)                ;INT OCCURS @ LEVEL BELOW PROC.
5357  026666  012212                          MOV     (R2)+,(R2)              ;OUTPUT PRIORITY
5358  026670  111137  002312                  MOVB    (R1),LINEB      ;LOAD LINE BYTE
5359  026674  012702  000001                  MOV     #1,R2
5360  026700  013700  024360                  MOV     CURTAB,R0       ;FIND UNIT#
5361  026704  162700  026244                  SUB     #KMCTAB,R0
5362  026710  001405                          BEQ     4$
5363  026712  005202                  3$:     INC     R2
5364  026714  162700  000012                  SUB     #12, R0
5365  026720  001401                          BEQ     4$
5366  026722  000773                          BR      3$
5367  026724  110237  002456          4$:     MOVB    R2,CUNIT        ;CURRENT UNIT #
5368  026730  062716  000002                  ADD     #2,(SP)
5369  026734  000207                          RTS     PC
5370                                  .SBTTL  ROUTINE TO SIZE MEMORY
5371
5372                                  ;;**********************************************************************
5373                                  ;*CALL:
5374                                  ;*      JSR     PC,$SIZE
5375                                  ;*      RETURN
5376                                  ;*$LSTAD WILL CONTAIN:
5377                                  ;*      WITH KT11 OPTION        -- LAST VIRTUAL ADDRESS OF THE LAST BANK
5378                                  ;*      WITHOUT KT11 OPTION     -- LAST ABSOLUTE ADDRESS OF AVAILABLE MEMORY
5379                                  ;*$LSTBK WILL CONTAIN THE LAST BANK AS A SAF
5380                                  ;*$KT11 IS THE MEMORY MANAGEMENT KEY
5381                                  ;*BIT07 = 0 DON'T USE MEMORY MANAGEMENT
5382                                  ;*      MUST BE SETUP BEFORE THE CALL
5383                                  ;*BIT15 = 0 DON'T HAVE MEMORY MANAGEMENT OPTION
5384                                  ;*      DETERMINED BY ROUTINE
5385
5386  026736  010046                  $SIZE:  MOV     R0,-(SP)        ;;SAVE R0 ON THE STACK
5387  026740  010146                          MOV     R1,-(SP)        ;;SAVE R1 ON THE STACK
5388  026742  010246                          MOV     R2,-(SP)        ;;SAVE R2 ON THE STACK
5389  026744  010346                          MOV     R3,-(SP)        ;;SAVE R3 ON THE STACK
5390  026746  010446                          MOV     R4,-(SP)        ;;SAVE R4 ON THE STACK                  BK001
5391  026750  013746  000114                  MOV     @#114,-(SP)     ;;SAVE MEMORY ERROR VECTOR PS & PC
5392  026754  013746  000116                  MOV     @#116,-(SP)
5393  026760  012737  000116  000114          MOV     #116,@#114      ;;IGNORE PARITY ERRORS WHILE SIZING
5394  026766  012737  000002  000116          MOV     #RTI,@#116
5395  026774  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE PRESENT ERROR VECTOR PS & PC
5396  027000  013746  000006                  MOV     @#ERRVEC+2,-(SP)
5397  027004  010600                          MOV     SP,R0           ;;SAVE THE STACK POINTER
5398                                  ;;SET THE ERRVEC PS TO THE PRESENT PS
5399  027006  104400                          TRAP                    ;;PUSH OLD PSW AND PC ON STACK
```

```
5400  027010  012637  000006          MOV     (SP)+,@#ERRVEC+2        ;;SAVE THE PSW IN @#ERRVEC+2
5401  027014  012701  003776          MOV     #3776,R1                ;;SETUP ADDRESS
5402  027020  105727                  TSTB    (PC)+                   ;;USE MEMORY MANAGEMENT?
5403  027022  000200          $KT11:  .WORD   200                     ;;SET TO USE MEMORY MANAGEMENT
5404  027024  100145                  BPL     $CORE                   ;;BR IF NO
5405  027026  012737  027332  000004  MOV     #$KTNEX,@#ERRVEC        ;;SET FOR TIMEOUT
5406  027034  005737  177572          TST     @#SR0                   ;;KT11 ARE YOU THERE?
5407  027040  052737  100000  027022  BIS     #100000,$KT11           ;;YES--SET KT11 KEY
5408  027046  012737  027076  000004  MOV     #100$,@#ERRVEC          ;;SET FOR TIMEOUT                       BK001
5409  027054  005737  170200          TST     @#170200                ;;UNIBUS MAP ARE YOU THERE?             BK001
5410  027060  012737  176200  027116  MOV     #176200,@#$STOP         ;;YES-SET COMPARISON VALUE FOR 11/70    BK001
5411  027066  012737  000200  027114  MOV     #200,@#$MAP             ;;TURN ON MAP INDICATOR                 BK001
5412  027074  000411                  BR      $MAPRG                  ;;GO SET UP MAP REGISTERS               BK001
5413  027076  012737  006200  027116  100$:   MOV     #6200,@#$STOP   ;;COMPARISON VALUE FOR 18 BIT MAPPING   BK001
5414  027104  022626                  CMP     (SP)+,(SP)+             ;;CLEAN OFF STACK                       BK001
5415  027106  005037  027114          CLR     @#$MAP                  ;;MAKE SURE MAP INDICATOR TURNED OFF    BK001
5416  027112  000412                  BR      $NOMAP                  ;;                                BK001
5417  027114  000000          $MAP:   .WORD   0                       ;;=200 IF MAP PRESENT                   BK001
5418  027116  000000          $STOP:  .WORD   0                       ;;FILLED WITH APPROPRIATE COMPARISON VALUE      BK001
5419  027120  012703  000037  $MAPRG: MOV     #37,R3                  ;;SET UP COUNTER                        BK001
5420  027124  012702  170200          MOV     #170200,R2              ;;START WITH MAPL0                      BK001
5421  027130  005022          100$:   CLR     (R2)+                   ;;LOAD ALL MAP REGISTERS                BK001
5422  027132  012722  000074          MOV     #74,(R2)+               ;;WITH THE VALUE 17000000               BK001
5423  027136  077304                  SOB     R3,100$                 ;;DO ALL 31 REGISTERS                   BK001
5424  027140          $NOMAP:
5425  027140  005046                  CLR     -(SP)                   ;;INITIALIZE FOR 'PAR' LOADING
5426  027142  012702  172340          MOV     #KIPAR0,R2              ;;ADDRESS OF FIRST 'PAR'
5427  027146  012703  000010          MOV     #^D8,R3                 ;;LOAD EIGHT 'PAR.'S' AND EIGHT 'PDR.'S'
5428  027152  012762  077406  177740  1$:     MOV     #77406,-40(R2)  ;;PDR = 4K, UP, READ/WRITE
5429  027160  011622                  MOV     (SP),(R2)+              ;;LOAD 'PAR'
5430  027162  062716  000200          ADD     #200,(SP)               ;;UPDATE FOR NEXT 'PAR'
5431  027166  077307                  SOB     R3,1$                   ;;LOOP UNTIL ALL EIGHT ARE LOADED
5432  027170  012742  177600          MOV     #177600,-(R2)           ;;SETUP KIPAR7 FOR I/O
5433  027174  005042                  CLR     -(R2)                   ;;SETUP KIPAR6 FOR TESTING
5434  027176  012737  027214  000004  MOV     #2$,@#ERRVEC            ;;CATCH TIMEOUT IF NO SR3
5435  027204  012737  000060  172516  MOV     #60,@#SR3               ;;ENABLE 22 BIT MODE AND UNIBUS MAP     BK001
5436  027212  000401                  BR      3$                      ;;THIS PDP-11 HAS A SR3 REGISTER
5437  027214  022626          2$:     CMP     (SP)+,(SP)+             ;;CLEAN OFF THE STACK--NO SR3
5438  027216  005237  177572  3$:     INC     @#SR0                   ;;TURN ON MEMORY MANAGEMENT
5439  027222  012737  027270  000004  MOV     #$KTOUT,@#ERRVEC        ;;SET FOR TIME OUT
5440  027230  105737  027114          TSTB    @#$MAP                  ;;IS MAP THERE?                         BK001
5441  027234  100006                  BPL     4$                      ;;NO-SKIP                               BK001
5442  027236  012737  027312  000114  MOV     #$MMOUT,@#114           ;;SET UP MEMORY ERROR VECTOR            BK001
5443  027244  013737  000006  000116  MOV     @#ERRVEC+2,@#116        ;;LOCK OUT INTERRUPTS           BK001
5444  027252  005737  143776  4$:     TST     @#143776                ;;TRAP ON NON-EX-MEM
5445  027256  062712  000040          ADD     #40,(R2)                ;;MAKE A 1K STEP
5446  027262  023712  027116          CMP     @#$STOP,(R2)            ;;LAST ONE?
5447  027266  101371                  BHI     4$                      ;;NO--TRY IT
5448  027270  011202          $KTOUT: MOV     (R2),R2                 ;;GET LAST BANK+1
5449  027272  005037  177572          CLR     @#SR0                   ;;TURN OFF MEMORY MANAGEMENT
5450  027276  105737  027114          TSTB    @#$MAP                  ;;IS MAP THERE?                         BK001
5451  027302  100034                  BPL     $SIZEX                  ;;NO-SKIP                               BK001
5452  027304  005037  172516          CLR     @#SR3                   ;;TURN OFF MAP                          BK001
5453  027310  000431                  BR      $SIZEX
5454  027312  013704  177744  $MMOUT: MOV     @#177744,R4             ;;SAVE MEMORY ERROR REGISTER            BK001
5455  027316  010437  177744          MOV     R4,@#177744             ;;CLEAR BITS IN REGISTER                BK001
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```
 5456  027322  032704  000001            BIT     #1,R4           ;;MEMORY TIMEOUT?                       BK001
 5457  027326  001360                    BNE     $KTOUT          ;;YES-EXIT                              BK001
 5458  027330  000002                    RTI                     ;;MUST BE PARITY ERROR-IGNORE IT        BK001
 5459  027332  042737  100000  027022  $KTNEX: BIC     #100000,$KT11   ;;KT11 NON-EXISTENT
 5460  027340  012737  027370  000004  $CORE:  MOV     #$CROUT,@#ERRVEC ;;SET FOR TIMEOUT
 5461  027346  005002                    CLR     R2              ;;SET UP BANK
 5462  027350  062701  004000          1$:     ADD     #4000,R1        ;;INCREMENT BY 1K
 5463  027354  062702  000040                  ADD     #40,R2          ;;1K STEP
 5464  027360  005711                    TST     (R1)            ;;TRAP ON TIME OUT
 5465  027362  022701  177776                  CMP     #177776,R1      ;;LAST ONE
 5466  027366  001370                    BNE     1$              ;;NO--TRY AGAIN
 5467  027370  162701  004000          $CROUT: SUB     #4000,R1
 5468  027374  162702  000040          $SIZEX: SUB     #40,R2          ;;DROP BACK
 5469  027400  010006                    MOV     R0,SP           ;;RESTORE THE STACK
 5470  027402  012637  000006                  MOV     (SP)+,@#ERRVEC+2 ;;RESTORE ERROR VECTOR
 5471  027406  012637  000004                  MOV     (SP)+,@#ERRVEC
 5472  027412  012637  000116                  MOV     (SP)+,@#116     ;;RESTORE MEMORY ERROR VECTOR
 5473  027416  012637  000114                  MOV     (SP)+,@#114
 5474  027422  010137  027446                  MOV     R1,$LSTAD       ;;LAST ADDRESS
 5475  027426  010237  027450                  MOV     R2,$LSTBK       ;;LAST BANK
 5476  027432  012604                    MOV     (SP)+,R4        ;;RESTORE R4                            BK001
 5477  027434  012603                    MOV     (SP)+,R3        ;;RESTORE R3
 5478  027436  012602                    MOV     (SP)+,R2        ;;RESTORE R2
 5479  027440  012601                    MOV     (SP)+,R1        ;;RESTORE R1
 5480  027442  012600                    MOV     (SP)+,R0        ;;RESTORE R0
 5481  027444  000207                    RTS     PC
 5482  027446  000000          $LSTAD: .WORD   0               ;;CONTAINS THE LAST ADDRESS
 5483  027450  000000          $LSTBK: .WORD   0               ;;CONTAINS THE LAST BANK
 5484
 5485  027452  012737  000200  027022  GETCOR: MOV     #200,$KT11      ;USE THE MEM. MANAGEMENT
 5486  027460  004737  026736                  JSR     PC,$SIZE
 5487  027464  005005                    CLR     R5
 5488  027466  013704  027446                  MOV     $LSTAD,R4       ;SET UP PHYSICAL ADDRESS
 5489  027472  005737  027022                  TST     $KT11           ;IS THERE A M.M?
 5490  027476  100024                    BPL     3$              ;B=N PHY ADDR. IN $LSTAD
 5491  027500  023727  027450  007540          CMP     $LSTBK,#7540    ;MORE THAN 124K?
 5492  027506  003403                    BLE     1$              ;B=NO
 5493  027510  012737  007540  027450          MOV     #7540,$LSTBK    ;ONLY NEED 18 BITS (ADDRESS)
 5494  027516                          1$:     ;MAKE THE VIRTUAL ADDRESS INTO A PHYSICAL
 5495  027516  013704  027450                  MOV     $LSTBK,R4
 5496  027522  012703  000006                  MOV     #6,R3
 5497  027526  000241                  2$:     CLC
 5498  027530  006304                    ASL     R4              ;ALLIGN BITS FOR AN 18 BIT PHYSICAL ADDRESS
 5499  027532  006105                    ROL     R5              ;MOVE CARRY INTO R5
 5500  027534  005303                    DEC     R3
 5501  027536  001373                    BNE     2$
 5502  027540  052704  003776                  BIS     #3776,R4        ;ADD 1K ($LSTAD ALWAYS 3776)
 5503  027544  010437  027446                  MOV     R4,$LSTAD       ;MAKE SAME AS NO KT11
 5504  027550                          3$:     ;$LSTAD = LOW ORDER 16 BITS + R5 = BITS 16 + 17 IN 0 + 1
 5505  027550  010537  002340                  MOV     R5,XBITS
 5506  027554  001006                    BNE     35$             ;BR=BASE<PHYSICAL ADDRESS
 5507  027556  023704  002532                  CMP     BADDR,R4        ;ANY CORE OVER  DIAG.
 5508  027562  103036                    BHIS    6$              ;B=NO   C/C=0
 5509  027564  013737  027446  002336          MOV     $LSTAD,HADDR
 5510  027572                          35$:
 5511  027572  000241                    CLC                     ;ADJUST FOR SIGNED SUBTRACT
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5512  027574  006004                        ROR     R4
5513  027576  013701  002532                MOV     BADDR,R1
5514  027602  160104                        SUB     R1,R4
5515  027604  000240                        NOP
5516  027606  000240                        NOP
5517  027610  000240                        NOP
5518                                                  ;****** ABOVE CODE MAY NEED ADJUSTMENT
5519  027612  103001                        BCC     4$              ;BORROW? B=N
5520  027614  005305                        DEC     R5              ;YES
5521  027616  006304                4$:     ASL     R4              ;2X RANGE = CHR COUNT
5522  027620  006105                        ROL     R5
5523  027622  010537  027662              MOV     R5,CCHI
5524  027626  010437  027664              MOV     R4,CCLO
5525                                      ;FIND C/C FOR UP TO 8K BYTES OVER THE BASE ADDRESS
5526  027632  005705                        TST     R5              ;OVER 8K BYTES?
5527  027634  001006                        BNE     5$              ;B=YES
5528  027636  022704  017777              CMP     #17777,R4       ;OVER OR EQUAL TO 8K BYTES?
5529  027642  003403                        BLE     5$              ;B=YES
5530  027644  010437  002534              MOV     R4,CCTST        ;MAX CC FOR TEST
5531  027650  000403                        BR      6$              ;
5532  027652  012737  020000  002534  5$:  MOV     #20000,CCTST    ;HIGHEST C/C=0
5533  027660  000207                6$:     RTS     PC
5534  027662  000000                CCHI:   0
5535  027664  000000                CCLO:   0
5536
5537                                      ;THIS ROUTINE WILL LOAD THE "NEXT" SEQUENTIAL 18 BIT BUFFER ADDRESS
5538                                      ;(BITS 17 + 16) INTO "EABITS" (BITS 15 + 14) AND (BITS 15-0) INTO
5539                                      ;"ADDR".  THE BUFFER ADDRESS IS DETERMINED FROM THE "LAST" BUFFER ADDRESS
5540                                      ;CALLED AND THE VALUE OF THE CHARACTER COUNT (LOCATION "CCNT").
5541                                      ;IF BUFFER IS GRANTED RETURN IS PC + 2 IF NOT RETURN IS PC
5542
5543  027666  000241                GETPHA: CLC
5544  027670  013704  030006              MOV     CCNT,R4         ;CHR COUNT /2
5545  027674  006004                        ROR     R4              ;CONVERT TO AN ADDRESS
5546  027676  060437  030010              ADD     R4,ADDR         ;ADDRESS
5547  027702  103011                        BCC     2$
5548  027704  062737  040000  030012      ADD     #40000,EABITS
5549  027712                        1$:     ;NOW FIND OUT IF ADDRESS IS LEGAL
5550  027712  063737  030006  030014      ADD     CCNT,ADINL      ;ADD REQ CHARACTER COUNT TO ADDRESS INDEX
5551  027720  103002                        BCC     2$
5552  027722  005237  030016              INC     ADINH           ;ADD CARRY
5553  027726  023737  030016  027662  2$:  CMP     ADINH,CCHI      ;DOES THIS REQUEST EXCEED THE BUFFER LENGTH?
5554  027734  003012                        BGT     4$              ;B=Y RET.=PC
5555  027736  023737  030014  027664      CMP     ADINL,CCLO
5556  027744  003403                        BLE     3$              ;B=OK GRANT BUFFER REQUEST
5557  027746  005737  030016              TST     ADINH           ;ARE THERE UPPER BITS?
5558  027752  001403                        BEQ     4$              ;B=N REG.=PC
5559  027754  062716  000002        3$:     ADD     #2,(SP)         ;GOOD RETURN
5560  027760  000207                        RTS     PC
5561  027762  005037  030012        4$:     CLR     EABITS          ;REPOINT BUFFER
5562  027766  013737  002532  030010      MOV     BADDR,ADDR      ;LOAD BASE ADDRESS (BUFFER)
5563  027774  005037  030014              CLR     ADINL           ;INITIALIZE ADDRESS INDEX COUNTERS
5564  030000  005037  030016              CLR     ADINH
5565  030004  000207                        RTS     PC
5566  030006  000000                CCNT:   0               ;# OF CHARACTERS REQUESTED IN BUFFER SIZE
5567  030010  000000                ADDR:   0               ;ADDDRESS OF REQUESTED BUFFER
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5568  030012  000000                  EABITS: 0               ;E.A. BITS OF REQL STED BUFFER
5569  030014  000000                  ADINL:  0               ;ADDRESS INDEX LOW (KEEPS TRACK OF INDEX IN BUFFER)
5570  030016  000000                  ADINH:  0               ;ADDRESS INDEX HIGH
5571
5572                                          ;THIS ROUTINE WILL LOAD THE DESIRED FIRMWARE (PARAMETER
5573                                          ;BLOCK SPECIFIED) TO THE CURRENTLY ACTIVE KMC-11
5574
5575  030020  013746  000004          LDMODE: MOV     @#4,-(SP)       ;SAVE 4 & 6
5576  030024  013746  000006                  MOV     @#6,-(SP)
5577  030030  012737  030166  000004          MOV     #4$,@#4         ;TIME OUT TRAP ROUTINE
5578  030036  012777  002000  152214          MOV     #2000,@SEL0
5579  030044  013737  030242  000004          MOV     6$,@#4
5580  030052  005037  030240                  CLR     5$              ;INITIALIZE THE ADDRESS COUNTER
5581  030056  012705  036060                  MOV     #CCPFRM,R5      ;SET POINTER FOR CCP MODE
5582  030062  105737  002311                  TSTB    MODE            ;REQUESTING CCP?
5583  030066  100007                          BPL     2$              ;B=YES CCP
5584  030070  012705  046060                  MOV     #BOPN32,R5      ;POINT TO FILE WO/CRC32
5585  030074  105737  002314                  TSTB    CRC32F          ;IS CRC32 ENABLED?
5586  030100  100002                          BPL     2$              ;B=NO
5587  030102  012705  042060                  MOV     #BOPW32,R5      ;POINT TO FILE WITH CRC32
5588  030106                          2$:     ;LOAD THE DATA WORD INTO KMC11
5589  030106  013777  030240  152154          MOV     5$,@SEL4        ;LOAD ADDRESS
5590  030114  012577  152154                  MOV     (R5)+,@SEL6     ;LOAD THE DATA WORD
5591  030120  052777  020000  152132          BIS     #20000,@SEL0
5592  030126  000240                          NOP
5593  030130  000240                          NOP
5594  030132  042777  020000  152120          BIC     #20000,@SEL0
5595                                          ;UPDATE THE ADDRESS AND TEST FOR DONE
5596  030140  005237  030240                  INC     5$              ;+1 TO ADDRESS COUNTER
5597  030144  022737  002000  030240          CMP     #2000,5$
5598  030152  001355                          BNE     2$
5599  030154  012637  000006                  MOV     (SP)+,@#6       ;RESTORE 4 & 6
5600  030160  012637  000004                  MOV     (SP)+,@#4
5601  030164  000207                          RTS     PC              ;RETURN WHEN DONE
5602  030166                          4$:     ;INDICATE KMC-11 NOT FOUND
5603  030166  062706  000004                  ADD     #4,SP           ;RESTORE STACK
5604  030172  104401  030200                  TYPE    ,65$            ;:TYPE ASCIZ STRING
5605  030176  000413                          BR      64$             ;;GET OVER THE ASCIZ
5606                                  ;;65$:  .ASCIZ  <15><12>/'KMC'' ADDRESS ERROR/
5607  030226                          64$:
5608  030226  013746  002260                  MOV     SEL0,-(SP)      ;GET DEVICE ADDRESS
5609  030232  104402                          TYPOC                   ; & TYPE IT OUT
5610  030234  000137  002076                  JMP     MONIT           ; RETURN TO MONITOR FOR CORRECTION
5611
5612  030240  000000                  5$:     0               ;ADDRESS COUNTER
5613  030242  000000                  6$:     0               ;TEMP. STORE
5614  030244  113737  002312  002313  SETLIN: MOVB    LINEB,CLINE     ;LOAD LINE BYTE
5615  030252  012737  177777  002454          MOV     #-1,CURLIN      ;INIT LINE
5616  030260  004737  031650                  JSR     PC,GETLIN       ;GET FIRST LINE
5617  030264  000000                          HALT                    ;;NO LINES ENABLED!!!
5618  030266  000207                          RTS     PC              ;EXIT
5619
5620
5621                                          ;THIS ROUTINE WILL DISPLAY ON THE CONSOLE DEVICE THE UNITS
5622                                          ;REQUIREING LOOP AROUND CONNECTORS.
5623                                          ;
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```
5624
5625  030270  012700  000020          LPARND: MOV     #16.,R0         ;CLEAR UNIT FLAGS
5626  030274  012701  030556                  MOV     #UNITFG,R1
5627  030300  005021                  1$:     CLR     (R1)+
5628  030302  005300                          DEC     R0
5629  030304  001375                          BNE     1$
5630  030306  012737  026232  024360          MOV     #KMCTAB-12.CURTAB
5631  030314  004737  026506          2$:     JSR     PC,GETKMC               ;GET NEXT ENABLED UNIT
5632  030320  000414                          BR      3$                      ;B=DONE DISPLAY UNITS
5633  030322  105737  002316                  TSTB    CLKDAT                  ;INTERNAL LOOP SELECTED?
5634  030326  100772                          BMI     2$                      ;B=YES
5635  030330  006337  002456                  ASL     CUNIT                   ;ADJUST UNIT # FOR MEMORY REF.
5636  030334  012701  030554                  MOV     #UNITFG-2,R1            ;INDEX INTO TABLE
5637  030340  063701  002456                  ADD     CUNIT,R1
5638  030344  012711  177777                  MOV     #-1,(R1)                ;SET FLAG
5639  030350  000761                          BR      2$                      ;CHECK FOR NEXT UNIT
5640                                          ;DISPLAY UNITS REQUIRING LOOP CONNECTORS
5641  030352  005037  002332          3$:     CLR     TYPFLG                  ;CLEAR TYPE INDICATOR FLAG
5642  030356  012737  000001  002456          MOV     #1,CUNIT
5643  030364  104401  030372                  TYPE    ,65$            ;;TYPE ASCIZ STRING
5644  030370  000421                          BR      64$             ;;GET OVER THE ASCIZ
5645                                  ;;65$:  .ASCIZ  <15><12>/UNITS REQUIRING LOOP CONNECTORS/
5646  030434                          64$:
5647  030434  012701  030556                  MOV     #UNITFG,R1              ;POINT TO UNIT TABLE
5648  030440  005721                  4$:     TST     (R1)+                   ;UNIT RUNNING EXTERNAL?
5649  030442  100017                          BPL     5$                      ;B=NO
5650  030444  104401  030452                  TYPE    ,67$            ;;TYPE ASCIZ STRING
5651  030450  000406                          BR      66$             ;;GET OVER THE ASCIZ
5652                                  ;;67$:  .ASCIZ  <15><12>/  UNIT # /
5653  030466                          66$:
5654  030466  013746  002456                  MOV     CUNIT,-(SP)     ;;SAVE CUNIT FOR TYPEOUT
5655  030472  104405                          TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
5656  030474  012737  177777  002332          MOV     #-1,TYPFLG              ;INDICATE UNIT # HAS BEEN PRINTED
5657  030502  005237  002456          5$:     INC     CUNIT
5658  030506  022737  000021  002456          CMP     #17.,CUNIT              ;DONE?
5659  030514  001351                          BNE     4$                      ;B=NO
5660  030516  005737  002332                  TST     TYPFLG                  ;ANNY UNITS DECLARED?
5661  030522  100407                          BMI     6$                      ;B=YES
5662  030524  104401  030532                  TYPE    ,69$            ;;TYPE ASCIZ STRING
5663  030530  000404                          BR      68$             ;;GET OVER THE ASCIZ
5664                                  ;;69$:  .ASCIZ  <15><12>/ NONE/
5665  030542                          68$:
5666  030542                          6$:
5667  030542  104401  030550                  TYPE    ,71$            ;;TYPE ASCIZ STRING
5668  030546  000402                          BR      70$             ;;GET OVER THE ASCIZ
5669                                  ;;71$:  .ASCIZ  <15><12>
5670  030554                          70$:
5671  030554  000207                          RTS     PC
5672
5673  030556  000020                  UNITFG: .BLKW   16.
5674
5675
5676
5677                                          ;THIS ROUTINE WILL LOAD EACH POTENTIAL INTERRUPT VECTOR FROM
5678                                          ;LOCATIONS 204 TO 776 WITH A .+2/IOT TRAP SEQUENCE TO CATCH
5679                                          ;ANY HARDWARE INTERRUPT TO AN ILLEGAL VECTOR.
```

```
 5680
 5681  030616  012700  000204          INTPRM: MOV     #204,R0         ;POIINTER TO LOCATIONS
 5682  030622  012701  000206                  MOV     #206,R1         ;CONTAINS ADDRESS
 5683  030626  010120                  1$:     MOV     R1,(R0)+        ;.+2
 5684  030630  012720  000004                  MOV     #IOT,(R0)+      ;IOT INSTR.
 5685  030634  062701  000004                  ADD     #4,R1
 5686  030640  022700  001000                  CMP     #1000,R0        ;DONE?
 5687  030644  001370                          BNE     1$              ;B=NO
 5688                                          ;LOAD TIME OUT TRAP VECTOR
 5689  030646  012737  000006  000004          MOV     #6,@#4
 5690  030654  012737  000004  000006          MOV     #4,@#6
 5691  030662  000207                          RTS     PC
 5692
 5693                                          ;THE FOLLOWING ROUTINE WILL INITIALIZE THE CURRENT KMC-11
 5694                                          ;FIRMWARE BY ISSUEING A MASTER CLEAR AND SETTING THE RUN
 5695                                          ;BIT.  A WATCH-LOOP IS EXECUTED TO ASSURE THAT THE FIRMWARE
 5696                                          ;IS RESPONDING TO THE USER COMMANDS.  IF THE FIRMWARE
 5697                                          ;SOULD BE HUNG OR FAILS TO RESPOND A RETURN TO PC IS
 5698                                          ;EXECUTED, OTHERWISE PC+2
 5699
 5700  030664  012737  000015  030756  INTKMC: MOV     #15,3$
 5701  030672  112777  000377  151364          MOVB    #377,@SEL2
 5702  030700  005077  151354                  CLR     @SEL0           ;*; CLEAR RUN, IF UP
 5703  030704  012777  040000  151346          MOV     #40000,@SEL0    ;SET MASTER CLEAR
 5704  030712  012777  100000  151340          MOV     #100000,@SEL0   ;RUN
 5705  030720  005037  001160                  CLR     $TMP0
 5706  030724  105237  001160          1$:     INCB    $TMP0           ;WAIT LOOP
 5707  030730  001375                          BNE     1$              ;
 5708  030732  105777  151326                  TSTB    @SEL2           ;DONE?
 5709  030736  001404                          BEQ     2$              ;B=Y
 5710  030740  005337  030756                  DEC     3$
 5711  030744  001367                          BNE     1$
 5712  030746  000207                          RTS     PC
 5713  030750  062716  000002          2$:     ADD     #2,(SP)
 5714  030754  000207                          RTS     PC
 5715  030756  000000                  3$:     0
 5716
 5717
 5718
 5719                                          ;THIS ROUTINE TEST THAT A 'REQUEST IN'' CAN BE DONE BY
 5720                                          ;CHECKING THAT NO OUTPUT REQUESTS ARE POSTED (SEL2) AND THAT
 5721                                          ;THE FIRMWARE RESPONDS TO A REQUEST IN BY POSTING THE READY-IN.
 5722                                          ;IF THE REQUEST IN CAN BE DONE THE RETURN IS TO PC+2 OTHERWISE TO PC
 5723
 5724  030760  112777  000040  151272  REQNT:  MOVB    #40,@SEL0               ;TRANSMIT BUFFER IN REQ.
 5725  030766  000417                          BR      REQGO
 5726  030770  112777  000044  151262  REQNR:  MOVB    #44,@SEL0               ;REC. BUFFER IN REQUEST
 5727  030776  000413                          BR      REQGO
 5728  031000  112777  000045  151252  REQNC:  MOVB    #45,@SEL0               ;CONTROL IN RECEIVE REQUEST
 5729  031006  000407                          BR      REQGO
 5730  031010  112777  000041  151242  REQNX:  MOVB    #41,@SEL0               ;CONTROL IN TRANSMIT REQUEST
 5731  031016  000403                          BR      REQGO
 5732  031020  112777  000043  151232  REQNI:  MOVB    #43,@SEL0               ;INITIALIZE IN REQUEST
 5733  031026  105777  151232          REQGO:  TSTB    @SEL2           ;OUTPUT REQUESTED
 5734  031032  100410                          BMI     2$              ;B=Y
 5735  031034  005037  001160                  CLR     $TMP0
```

```
5736  031040  105777  151214          1$:     TSTB    @SEL0           ;IS REQUEST GRANTED?
5737  031044  100404                  BMI     3$              ;B=Y
5738  031046  005237  001160          INC     $TMP0           ;ALLOW TIME FOR RESPONSE
5739  031052  001372                  BNE     1$              ;TRY AGAIN
5740  031054  000207          2$:     RTS     PC              ;RETURN PC
5741  031056  062716  000002  3$:     ADD     #2,(SP)
5742  031062  000207                  RTS     PC
5743
5744
5745                                  ;THIS ROUTINE WILL LOAD THE LINE INITIALIZE COMMAND
5746                                  ;IN TO THE DEVICE REGISTERS, CURLIN=LINE # (AT THIS POINE RDY=IN
5747                                  ;IS SET)
5748  031064  113777  002454  151174  INTLIN: MOVB    CURLIN,@SEL3
5749  031072  012777  000400  151174          MOV     #400,@SEL6      ;ENABLE LINE
5750  031100  005077  151164                  CLR     @SEL4           ;UNUSED
5751  031104  004737  031772                  JSR     PC,INPDUN       ;TEST THAT INPUT COMPLETED
5752  031110  000207                  RTS     PC              ;RDY-IN FAILED TO DROP
5753  031112  062716  000002                  ADD     #2,(SP)
5754  031116  000207                  RTS     PC              ;COMMAND COMPLETED
5755
5756                                  ;THIS ROUTINE WILL INITIALIZE ALL THE LINES STARTING AT LINE 1
5757  031120  013700  002454  INTALL: MOV     CURLIN,R0
5758  031124  113737  002313  031202          MOVB    CLINE,HOLDB     ;SAVE LINE BYTE
5759  031132  004737  030244                  JSR     PC,SETLIN       ;INITIALIZE LINE # COUNTER
5760  031136                  1$:
5761  031136  004737  031020                  JSR     PC,REQNI        ;CAN A INITIALIZE IN BE EXECUTED?
5762  031142  000411                  BR      3$              ;A REQUEST IN FAILED
5763  031144  004737  031064                  JSR     PC,INTLIN       ;INITIALIZE # IN CURLIN
5764  031150  000406                  BR      3$              ;LINE INITIALIZATE COMMAND FAILED TO COMPLETE
5765  031152  004737  031650                  JSR     PC,GETLIN       ;GET THE NEXT LINE NUMBER
5766  031156  000401                  BR      2$
5767  031160  000766                  BR      1$
5768  031162  062716  000002          2$:     ADD     #2,(SP)
5769  031166  010037  002454          3$:     MOV     R0,CURLIN
5770  031172  113737  031202  002313          MOVB    HOLDB,CLINE     ;RESTORE
5771  031200  000207                  RTS     PC
5772  031202  000000          HOLDB:  0
5773
5774
5775                                  ;THIS ROUTINE WILL ISSUE A LINE INITIALIZE TO THE LINE
5776                                  ;SPECIFIED IN "CURLIN"
5777
5778  031204                  INTLNE:
5779  031204  004737  031020                  JSR     PC,REQNI        ;CAN A INITIALIZE IN BE EXECUTED?
5780  031210  000405                  BR      1$
5781  031212  004737  031064                  JSR     PC,INTLIN       ;INITIALIZE # IN CURLIN
5782  031216  000402                  BR      1$
5783  031220  062716  000002                  ADD     #2,(SP)         ;SET GOOD RETURN
5784  031224  000207          1$:     RTS     PC
5785
5786
5787                                  ;THIS ROUTINE WILL START THE MAINTENCE CLOCK ON ALL ENABLED LINES
5788
5789  031226  013746  002454  CLKALL: MOV     CURLIN,-(SP)            ;SAVE CURLIN
5790  031232  004737  030244                  JSR     PC,SETLIN
5791  031236                  1$:
```

```
5792  031236  004737  031274          JSR     PC,STCLK        ;SET MAINT LOOP + START CLOCK
5793  031242  000411                  BR      3$
5794  031244  004737  031650          JSR     PC,GETLIN       ;GET THE NEXT LINE NUMBER
5795  031250  000401                  BR      2$                      ;B=NO MORE LINES ENABLED
5796  031252  000771                  BR      1$                      ;DO NEXT LINE
5797  031254  012637  002454  2$:     MOV     (SP)+,CURLIN            ;RESTORE CURLIN
5798  031260  062716  000002          ADD     #2,(SP)                 ;SET FOR A GOOD RETURN
5799  031264  000207                  RTS     PC
5800  031266  012637  002454  3$:     MOV     (SP)+,CURLIN            ;RESTORE CURLIN
5801  031272  000207                  RTS     PC                      ;RETURN
5802
5803                                  ;THIS ROUTINE WILL SET THE MAINTENANCE LOOP AND START THE
5804                                  ;CLOCK.  IF COMMAND FAILS TO EXECUTE A RETURN IS MADE TO
5805                                  ;PC, OTHERWISE TO PC+2.
5806
5807  031274          STCLK:
5808  031274  004737  031000          JSR     PC,REQNC        ;CAN A CONTROL IN BE EXECUTED?
5809  031300  000415                  BR      2$              ;CANNOT ISSUE COMMAND
5810  031302  113777  002454  150756  MOVB    CURLIN,@SEL3    ;SELECT LINE #
5811  031310  112777  000100  150760  MOVB    #100,@SEL7      ;INDICATE LOADING A MAINT. COMMAND
5812  031316  113777  002316  150750  MOVB    CLKDAT,@SEL6    ;SET INTERNAL LOOP + START CLOCK
5813  031324  005077  150740          CLR     @SEL4           ;UNUSED
5814  031330  004737  031772          JSR     PC,INPDUN       ;TEST THAT INPUT COMPLETED
5815  031334  000207          2$:     RTS     PC              ;COMMAND NOT COMPLETED
5816  031336  062716  000002  3$:     ADD     #2,(SP)
5817  031342  000207                  RTS     PC
5818
5819                                  ;THIS ROUTINE WILL EXECUTE EITHER A RECEIVE OR TRANSMIT BUFFER
5820                                  ;IN COMMAND DEPENDING ON THE ENTRY POINT.  THE BUFFER ADDRESS
5821                                  ;IS OBTAINED FROM LOCATION "BUFADR" AND "BUFEA" AND THE CHARACTER
5822                                  ;COUNT OF THE BUFFER FROM "BUFCNT".  CURLIN = LINE #
5823
5824  031344          RIN:
5825  031344  004737  030770          JSR     PC,REQNR        ;CAN A REC. BUFFER-IN BE EXECUTED?
5826  031350  000422                  BR      RPT             ;RECEIVE BUFFER FAIL TO
5827  031352  000403                  BR      FRD
5828  031354          XIN:
5829  031354  004737  030760          JSR     PC,REQNT        ;CAN A TRANSMIT BUFF. IN BE EXECUTED?
5830  031360  000416                  BR      RPT     ;TRANSMIT BUFFER FAILED TO LOAD
5831  031362  113777  002454  150676  FRD:    MOVB    CURLIN,@SEL3    ;LOAD LINE #
5832  031370  013777  002522  150672          MOV     BUFADR,@SEL4    ;16 BIT BUFFER ADDRESS
5833  031376  013777  002524  150670          MOV     BUFEA,@SEL6     ;LOAD EA BITS
5834  031404  063777  002526  150662          ADD     BUFCNT,@SEL6    ;LOAD CHARACTER COUNT OF BUFFER
5835  031412  004737  031772          JSR     PC,INPDUN       ;TEST THAT INPUT COMPLETED
5836  031416  000207          RPT:    RTS     PC
5837  031420  062716  000002          ADD     #2,(SP)
5838  031424  000207                  RTS     PC
5839
5840                                  ;THIS ROUTINE WILL COUNT THE # OF ONES IN THE WORD
5841                                  ;CONTAINED IN LOCATION "WAS" AND RETURN TO PC IF THE
5842                                  ;# IF ODD OR PC+2 IF EVEN.
5843
5844  031426  012701  000010  PARCHK: MOV     #8.,R1          ;COUNT BITS TESTED
5845  031432  005002                  CLR     R2
5846  031434  113700  002464          MOVB    WAS,R0
5847  031440  100402                  BMI     13$             ;BR=BIT 7 = 1
```

```
5848  031442  106300                  12$:    ASLB    R0
5849  031444  100001                          BPL     14$
5850  031446  005202                  13$:    INC     R2              ;COUNT THE ONES
5851  031450  005301                  14$:    DEC     R1              ;COUNT THE ONES
5852  031452  001373                          BNE     12$             ;B=N
5853                                          ;ODD OR EVEN
5854  031454  032702  000001                  BIT     #1,R2
5855  031460  001002                          BNE     15$             ;B=ODD
5856  031462  062716  000002                  ADD     #2,(SP)         ;EVEN
5857  031466  000207                  15$:    RTS     PC
5858
5859                                          ;THIS ROUTINE WILL STORE CONTENTS OF THE CSRS FOR DISPLAYING
5860                                          ;IN THE ERROR REPORT ROUTINE
5861
5862  031470  017737  150564  002342  GETCSR: MOV     @SEL0,CSR0
5863  031476  017737  150562  002344          MOV     @SEL2,CSR2
5864  031504  017737  150560  002346          MOV     @SEL4,CSR4
5865  031512  017737  150556  002350          MOV     @SEL6,CSR6
5866  031520  000207                          RTS     PC
5867
5868
5869  031522  127727  150536  000200  RBONLY: CMPB    @SEL2,#200      ;XMIT?
5870  031530  001005                          BNE     1$              ;SKIP IF NO
5871  031532  105077  150526                  CLRB    @SEL2           ;CLEAR
5872  031536  004737  031742                  JSR     PC,REQOUT
5873  031542  000240                          NOP
5874  031544  000207                  1$:     RTS     PC
5875
5876
5877                                          ;THIS ROUTINE WILL ISSUE A LINE RESET COMMAND TO THE
5878                                          ;LINE SPECIFIED BY "CURLIN".
5879
5880  031546                          LRSET:
5881  031546  004737  031000                  JSR     PC,REQNC        ;CAN A CONTROL IN BE EXECUTED?
5882  031552  000414                          BR      2$              ;OUT REQ. OR HUNG
5883  031554  113777  002454  150504          MOVB    CURLIN,@SEL3    ;LD LINE #
5884  031562  112777  000020  150506          MOVB    #20,@SEL7       ;LINE RESET COMMAND
5885  031570  005077  150474                  CLR     @SEL4           ;UNUSED
5886  031574  105077  150474                  CLRB    @SEL6           ;UNUSED
5887  031600  004737  031772                  JSR     PC,INPDUN       ;TEST THAT INPUT COMPLETED
5888  031604  000207                  2$:     RTS     PC
5889  031606  062716  000002                  ADD     #2,(SP)
5890  031612  000207                          RTS     PC
5891
5892
5893
5894                                          ;TEST THAT INPUT COMMAND COMPLETD PC+2 = COMPLETED PC = NOT COMPLETED
5895  031614  105037  001160          COMIN:  CLRB    $TMP0
5896  031620  105777  150434          1$:     TSTB    @SEL0           ;DID RDY IN DROP?
5897  031624  100004                          BPL     2$              ;B=Y
5898  031626  105237  001160                  INCB    $TMP0
5899  031632  001372                          BNE     1$
5900  031634  000207                          RTS     PC              ;COMMAND NOT COMPLETED
5901  031636  062716  000002          2$:     ADD     #2,(SP)
5902  031642  000207                          RTS     PC              ;OK
5903
```

```
5904                                            ;RETURN PC+2 = NEW LINE # IN CURLIN, PC=DONE
5905  031644  106337  002313          GETLN0: ASLB    CLINE           ;SHIFT TO NEXT LINE
5906  031650  005237  002454          GETLIN: INC     CURLIN
5907  031654  105737  002313                  TSTB    CLINE           ;LOOK FOR LINE BIT
5908  031660  001406                          BEQ     1$              ;SKIP IF NONE LEFT
5909  031662  100370                          BPL     GETLN0          ;CHECK AGAIN
5910  031664  106337  002313                  ASLB    CLINE           ;SHIFT
5911  031670  062716  000002                  ADD     #2,(SP)         ;FOUND LINE
5912  031674  000207                          RTS     PC
5913  031676  113737  002312  002313  1$:     MOVB    LINEB,CLINE     ;INIT LINES
5914  031704  012737  177777  002454          MOV     #-1,CURLIN      ;RESET
5915  031712  000207                          RTS     PC              ;EXIT
5916
5917
5918
5919                                            ;THIS ROUTINE WILL ALLOW TIME FOR KMC TO DETECT SYNC
5920  031714  005037  001160          SYNTIM: CLR     $TMP0
5921  031720  005037  001162                  CLR     $TMP1
5922  031724  005237  001160          1$:     INC     $TMP0
5923  031730  001375                          BNE     1$
5924  031732  005137  001162                  COM     $TMP1
5925  031736  001372                          BNE     1$
5926  031740  000207                          RTS     PC
5927
5928
5929                                            ;THIS ROUTINE WILL MONITOR THE REQUEST OUT OF SEL2
5930                                            ;FOR SETTING WITHIN DURATION OF 1 LOOP
5931
5932  031742  005037  001160          REQOUT: CLR     $TMP0
5933  031746  105777  150312          1$:     TSTB    @SEL2           ;OUTPUT REQUESTED?
5934  031752  100404                          BMI     2$              ;B=YES
5935  031754  005237  001160                  INC     $TMP0
5936  031760  001372                          BNE     1$              ;TRY AGAIN
5937  031762  000207                          RTS     PC              ;NO OUTPUT REQUESTED
5938  031764  062716  000002          2$:     ADD     #2,(SP)
5939  031770  000207                          RTS     PC              ;OUTPUT IS REQUESTED
5940                                            ;THIS ROUTINE WILL TEST THAT THE INPUT STATUS COMMAND
5941                                            ;WILL COMPLETE (RDY-IN DROPS)
5942  031772  042777  000040  150260  INPDUN: BIC     #40,@SEL0
5943  032000  005037  001160                  CLR     $TMP0           ;INSRUCT COMMAND READY
5944  032004  105777  150250          1$:     TSTB    @SEL0           ;INPUT DONE?
5945  032010  100004                          BPL     2$              ;B=YES
5946  032012  005237  001160                  INC     $TMP0
5947  032016  001372                          BNE     1$
5948  032020  000207                          RTS     PC              ;COMMAND NOT ACCEPTED
5949  032022  062716  000002          2$:     ADD     #2,(SP)
5950  032026  000207                          RTS     PC              ;COMMAND DONE
5951
5952                                            ;IF BUFFER REQ. IS LEGAL (CORE AVAIL + WITHIN BOUNDS) MAP KT11
5953                                            ;(IF EXISTANT) AND RETURN TO PC+2 OTHERWISE PC
5954                                            ;ENTER AT -
5955                                            ;       MAPBFR - IF RECEIVE BUFFER POSSIBLY NEEDING CRC BITS
5956                                            ;       MAPBUF - IF ANY OTHER BUFFER
5957
5958  032030  012700  000001          MAPBFR: MOV     #1,R0   ;SET RECEIVE BUFFER FLAG
5959  032034  000401                          BR      MAPBFC
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```
 5960  032036  005000                  MAPBUF: CLR     R0              ;SET OTHER BUFFER FLAG
 5961  032040  005737  027022          MAPBFC: TST     $KT11
 5962  032044  100003                          BPL     8$              ;B=N
 5963  032046  042737  000001  177572          BIC     #1,@#SR0        ;SHUT OFF KT11
 5964  032054  013737  002500  002502  8$:     MOV     CURBUF,MAPADR   ;USE TO READ THE DATA
 5965  032062  013702  002476                  MOV     CUREA,R2
 5966                                  ;FORM RETURN ADDRESS
 5967  032066  013701  002500                  MOV     CURBUF,R1
 5968  032072  062701  000010                  ADD     #10,R1
 5969  032076  103001                          BCC     10$             ;B=NO CARRY
 5970  032100  005202                          INC     R2              ;+1 TO THE EA BITS
 5971  032102  105737  002311          10$:    TSTB    MODE            ;BOP OR CCP
 5972  032106  100020                          BPL     1$              ;SKIP IF CCP
 5973  032110  062701  000010                  ADD     #10,R1          ;CHANGE WORD COUNT TO BYTES
 5974  032114  103001                          BCC     11$
 5975  032116  005202                          INC     R2
 5976  032120  005700                  11$:    TST     R0              ;IS THIS A RECEIVE BUFFER?
 5977  032122  001412                          BEQ     1$              ;SKIP IF NO
 5978  032124  105737  002316                  TSTB    CLKDAT          ;EXTERNAL?
 5979  032130  100407                          BMI     1$              ;SKIP IF INTERNAL
 5980  032132  105737  002314                  TSTB    CRC32F          ;CRC32 ENABLED?
 5981  032136  100004                          BPL     1$              ;SKIP IF NOT ENABLED
 5982  032140  062701  000004                  ADD     #4,R1           ;ADD ADDITIONAL CRC BYTES
 5983  032144  103001                          BCC     1$
 5984  032146  005202                          INC     R2
 5985  032150  010137  002512          1$:     MOV     R1,RETADR
 5986  032154  010205                          MOV     R2,R5
 5987  032156  005004                          CLR     R4
 5988  032160  000241                          CLC
 5989  032162  012700  000002                  MOV     #2,R0
 5990  032166  006205                  14$:    ASR     R5
 5991  032170  006004                          ROR     R4
 5992  032172  005300                          DEC     R0
 5993  032174  001374                          BNE     14$
 5994  032176  010437  002510                  MOV     R4,RETEA
 5995  032202  020237  002340                  CMP     R2,XBITS        ;IS REQUESTED BUFFER LEGAL?
 5996  032206  003122                          BGT     7$              ;B=N DON'T ISSUE THE REQ.
 5997  032210  001003                          BNE     15$             ;B=THERE FOR LESS THAN
 5998  032212  020137  002336                  CMP     R1,HADDR        ;THEN 16 BIT ADDR MUST BE LESS OR EQ
 5999  032216  101116                          BHI     7$              ;IF GREATER OR NOT EQUAL = DONE
 6000                                  ;IF A KT11 AVAILABLE MAP APPROPRIATELY
 6001  032220  005037  002524          15$:    CLR     BUFEA
 6002  032224  005737  027022                  TST     $KT11
 6003  032230  100076                          BPL     66$             ;NO KT11
 6004  032232  012700  000006                  MOV     #6,R0
 6005  032236  012701  172300                  MOV     #KIPDR0,R1
 6006  032242  012721  077406          2$:     MOV     #77406,(R1)+    ;LOAD PDR.
 6007  032246  005300                          DEC     R0
 6008  032250  001374                          BNE     2$
 6009  032252  012700  000001                  MOV     #1,R0           ;DISABLE 6
 6010  032256  012721  077400          3$:     MOV     #77400,(R1)+    ;NO ACCESS
 6011  032262  005300                          DEC     R0
 6012  032264  00[illegible]74                  BNE     3$
 6013  032266  012[illegible]1  077406          MOV     #77406,(R1)     ;PG 7
 6014  032272  013702  002476                  MOV     CUREA,R2
 6015  032276  013701  002500                  MOV     CURBUF,R1
```

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 6016  032302  000241                          CLC
 6017  032304  012700  000012                  MOV     #10.,R0         ;KT11 FORMAT
 6018  032310  006301                  4$:     ASL     R1
 6019  032312  006102                          ROL     R2
 6020  032314  005300                          DEC     R0
 6021  032316  001374                          BNE     4$
 6022  032320  042702  000077                  BIC     #77,R2          ;ASSURE A 4K BOUND
 6023  032324  012700  172340                  MOV     #KIPAR0,R0      ;MAP THE PAGES
 6024  032330  005001                          CLR     R1
 6025  032332  012704  000005                  MOV     #5,R4
 6026  032336  010120                  5$:     MOV     R1,(R0)+        ;DO PAGES 0,1,2,3,+4 (MAIN PROGRAM)
 6027  032340  062701  000200                  ADD     #200,R1         ;4K
 6028  032344  005304                          DEC     R4              ;DONE?
 6029  032346  001373                          BNE     5$              ;B=N
 6030  032350  010210                          MOV     R2,(R0)         ;MAP PAGE 5 WITH BUFFER (REC) ADDRESS
 6031  032352  012737  177600  172356          MOV     #177600,@#KIPAR7        ;I/O PG.
 6032  032360  013737  002532  002502          MOV     BADDR,MAPADR
 6033  032366  062737  020000  002502          ADD     #20000,MAPADR
 6034  032374  052737  000001  177572          BIS     #1,@#SR0        ;KT11 ON
 6035  032402  000241                          CLC                     ;ALLIGN EA BITS
 6036  032404  012700  000003                  MOV     #3,R0
 6037  032410  013701  002476                  MOV     CUREA,R1
 6038  032414  006001                  65$:    ROR     R1              ;ALIGN EA BITS FOR CSR FORMAT
 6039  032416  005300                          DEC     R0
 6040  032420  001375                          BNE     65$
 6041  032422  010137  002524                  MOV     R1,BUFEA        ;PHYSICAL CSR EA FORMAT (15-14)
 6042  032426  012737  010010  002526  66$:    MOV     #10010,BUFCNT   ;LENGTH OF BUFFER
 6043  032434  043737  002330  002526          BIC     MODMSK,BUFCNT
 6044  032442  013737  002500  002522          MOV     CURBUF,BUFADR   ;BUFFER ADDRESS (PHYSICAL 0-15)
 6045  032450  062716  000002                  ADD     #2,(SP)
 6046  032454  000207                  7$:     RTS     PC
 6047
 6048                                          ;THIS ROUTINE WILL INITIALIZE THE "CURBUF" BY CLEARING IT
 6049                                          ;AND WRITING THE TRANSMIT BUFFER(TBUF)
 6050                                          ;WITH A 10 CHARACTER INCREMENT PATTERN
 6051
 6052  032456  013700  002502          INTREC: MOV     MAPADR,R0       ;CURRENTLY MAPPED BUFFER
 6053  032462  005020                  1$:     CLR     (R0)+           ;CLEAR ALL 127. WORDS
 6054  032464  032700  000177                  BIT     #177,R0         ;DONE
 6055  032470  001374                          BNE     1$
 6056                                          ;WRITE THE TRANSMIT BUFFER
 6057  032472  012702  052260                  MOV     #TBUF,R2        ;SET STARTING ADDRESS
 6058  032476  012701  000010                  MOV     #10,R1          ;SET LENGTH OF BUFFER
 6059  032502  004737  032542                  JSR     PC,MEMFIL       ;FILL BUFFER
 6060  032506  000207                          RTS     PC
 6061
 6062                                          ;THIS ROUTINE W' L INITIALIZE THE "CURBUF" BY WRITING IT WITH
 6063                                          ;A 10 CHARACTER .NCREMENT PATTERN THEN CLEARING
 6064                                          ; THE RECEIVE BUFFER (RBUF)
 6065
 6066  032510  013702  002502          INTTRM: MOV     MAPADR,R2       ;CURRENTLY MAPPED BUFFER
 6067  032514  012701  000010                  MOV     #10,R1          ;LENGTH OF BUFFER
 6068  032520  004737  032542                  JSR     PC,MEMFIL       ;FILL BUFFER WITH INCREMENTING PATTERN
 6069                                          ;CLEAR THE RECEIVE BUFFER
 6070  032524  012700  052660                  MOV     #RBUF,R0
 6071  032530  005020                  2$:     CLR     (R0)+
```

```
 6072  032532  020027  053056                 CMP     R0,#RBUF+126.   ;DONE?
 6073  032536  001374                         BNE     2$              ;B=N
 6074  032540  000207                         RTS     PC
 6075
 6076                                         ;THIS ROUTINE WILL WRITE AN INCREMENTING PATTERN IN THE
 6077                                         ;NAMED BUFFER.  IN BOP MODE ALL PATTERNS WILL BE USED
 6078                                         ;IN CCP MODE ONLY PATTERNS 40-175 WILL BE USED.
 6079                                         ;ENTER WITH     R1=LENGTH OF BUFFER IN BYTES
 6080                                         ;               R2=STARTING ADDRESS OF BUFFER
 6081
 6082  032542  010146                 MEMFIL: MOV     R1,-(SP)
 6083  032544  010246                         MOV     R2,-(SP)
 6084  032546  105737  002311                 TSTB    MODE
 6085  032552  100412                         BMI     1$
 6086  032554  012737  000175  032710         MOV     #175,20$        ;CCP HIGH LIMIT=175
 6087  032562  012737  000040  032712         MOV     #40,21$         ;CCP LOW LIMIT=40
 6088  032570  112722  000201                 MOVB    #201,(R2)+      ;SET 1ST CHAR TO SOH
 6089  032574  005301                         DEC     R1              ;REDUCE REMAINING CHAR COUNT
 6090  032576  000406                         BR      2$
 6091  032600  012737  000377  032710  1$:    MOV     #377,20$        ;BOP HIGH LIMIT=377
 6092  032606  012737  000000  032712         MOV     #0,21$          ;BOP LOW LIMIT=0
 6093  032614  023737  032712  032714  2$:    CMP     21$,22$         ;CURRENT VALUE BELOW ALLOWABLE RANGE?
 6094  032622  101004                         BHI     3$              ;B=YES
 6095  032624  023737  032710  032714         CMP     20$,22$         ;CURRENT VALUE ABOVE ALLOWABLE RANGE
 6096  032632  101003                         BHI     4$              ;B=NO
 6097  032634  013737  032712  032714  3$:    MOV     21$,22$         ;SET VALUE TO LOWEST POSSIBLE
 6098  032642  113722  032714          4$:    MOVB    22$,(R2)+       ;STORE PATTERN INTO BUFFER
 6099  032646  005301                         DEC     R1              ;COUNT DOWN NUMBER OF BYTES
 6100  032650  003407                         BLE     6$              ;B=DONE
 6101  032652  105237  032714                 INCB    22$             ;INCREMENT DATA PATTERN
 6102  032656  023737  032710  032714         CMP     20$,22$         ;HAVE WE PASSED HIGHEST VALUE?
 6103  032664  103366                         BHIS    4$              ;B=CONTINUE WITH THIS PATTERN
 6104  032666  000762                         BR      3$              ;START OVER WITH LOWEST VALUE
 6105  032670  105737  002311          6$:    TSTB    MODE            ;WHEN COMPLETE , CHECK MODE
 6106  032674  100402                         BMI     7$              ;SKIP IF BOP
 6107  032676  112742  000003                 MOVB    #3,-(R2)        ;IF CCP REWRITE LAST BYTE AS ETX
 6108  032702  012602                 7$:     MOV     (SP)+,R2
 6109  032704  012601                         MOV     (SP)+,R1
 6110  032706  000207                         RTS     PC
 6111  032710  000000                 20$:    .WORD   0               ;HIGHEST ALLOWED PATTERN
 6112  032712  000000                 21$:    .WORD   0               ;LOWEST ALLOWED PATTERN
 6113  032714  000000                 22$:    .WORD   0               ;CURRENT DATA PATTERN
 6114
 6115                                         ;THIS ROUTINE WILL TEST THE DATA TRANSFERRED TO TH" RECEIVE BUFFER
 6116                                         ;TWO ENTRY POINTS ALLOW FOR THE CURRENT "RECEIVE" BUFFER
 6117
 6118  032716  012701  052660         TSTREC: MOV     #RBUF,R1        ;TABLE "RBUF" IS THE RECEIVE BUFFER
 6119  032722  000402                         BR      .+6
 6120  032724  013701  002502         TSTMAP: MOV     MAPADR,R1       ;"MAPBUF" CONTAINS THE ADDRESSED RECEIVE BUFFER
 6121  032730  012737  000003  002462         MOV     #3,SHBE
 6122  032736  112137  002464          1$:    MOVB    (R1)+,WAS
 6123  032742  142737  000200  002464         BICB    #200,WAS        ;ELIMINATE THE PARITY BIT
 6124  032750  123737  002462  002464         CMPB    SHBE,WAS        ;DOES DATA COMPARE?
 6125  032756  001010                         BNE     2$              ;REPORT ERROR
 6126  032760  005237  002462                 INC     SHBE
 6127  032764  022737  000177  002462         CMP     #177,SHBE       ;DONE?
```

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 6128  032772  001361                        BNE     1$              ;B=NO GET NEXT VALUE
 6129  032774  062716  000002                ADD     #2,(SP)
 6130  033000  000207                2$:     RTS     PC
 6131  033002     201     101     127  TERBUF: .BYTE   201,101,127,3   ;SOH & ETX
 6132  033005     003
 6133  033006     201     101     127          .BYTE   201,101,127,27  ;SOH & ETB
 6134  033011     027
 6135  033012     202     101     127          .BYTE   202,101,127,3   ;STX & ETX
 6136  033015     003
 6137  033016     202     101     127          .BYTE   202,101,127,27  ;STX & ETB
 6138  033021     027
 6139
 6140  033022     201     101     101  T7BUF:  .BYTE   201,101,101,3
 6141  033025     003
 6142  033026     226     202     101  LRCBUF: .BYTE   226,202,101,127,127,127,3,376
 6143  033031     127     127     127
 6144  033034     003     376
 6145  033036     226     202     101  PERBUF: .BYTE   226,202,101,126,127,127,3,376
 6146  033041     126     127     127
 6147  033044     003     376
 6148  033046  000000                        .WORD   0
 6149
 6150
 6151  033050  044506  046522  040527  EM01:   .ASCIZ  /FIRMWARE INITIALIZE TEST/
 6152  033056  042522  044440  044516
 6153  033064  044524  046101  055111
 6154  033072  020105  042524  052123
 6155  033100     000
 6156  033101     122  040505  054504  EM02:   .ASCIZ  /READY IN BIT (SEL0-BIT5) TEST/
 6157  033106  044440  020116  044502
 6158  033114  020124  051450  046105
 6159  033122  026460  044502  032524
 6160  033130  020051  042524  052123
 6161  033136     000
 6162  033137     116  026517  052517  EM03:   .ASCIZ  /NO-OUTPUT READY TEST/
 6163  033144  050124  052125  051040
 6164  033152  040505  054504  052040
 6165  033160  051505  000124
 6166  033164  044514  042516  044440  EM04:   .ASCIZ  /LINE INITIALIZE TEST/
 6167  033172  044516  044524  046101
 6168  033200  055111  020105  042524
 6169  033206  052123     000
 6170  033211     122  041505  044505  EM05:   .ASCIZ  /RECEIVE BUFFER-IN TEST/
 6171  033216  042526  041040  043125
 6172  033224  042506  026522  047111
 6173  033232  052040  051505  000124
 6174  033240  051124  047101  046523  EM06:   .ASCIZ  /TRANSMIT BUFFER-IN TEST/
 6175  033246  052111  041040  043125
 6176  033254  042506  026522  047111
 6177  033262  052040  051505  000124
 6178  033270  047111  052111  040511  EM07:   .ASCIZ  !INITIAL I/O COMPLETION TEST!
 6179  033276  020114  027511  020117
 6180  033304  047503  050115  042514
 6181  033312  044524  047117  052040
 6182  033320  051505  000124
 6183  033324  044514  042516  047440  EM10:   .ASCIZ  /LINE OVERFLOW TEST/
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 6184  033332  042526  043122  047514
 6185  033340  020127  042524  052123
 6186  033346     000
 6187  033347     114  047111  020105  EM11:   .ASCIZ  /LINE RESET OF RECEIVE BUFFERS/
 6188  033354  042522  042523  020124
 6189  033362  043117  051040  041505
 6190  033370  044505  042526  041040
 6191  033376  043125  042506  051522
 6192  033404     000
 6193  033405     114  047111  020105  EM12:   .ASCIZ  /LINE RESET OF TRANSMIT BUFFERS/
 6194  033412  042522  042523  020124
 6195  033420  043117  052040  040522
 6196  033426  051516  044515  020124
 6197  033434  052502  043106  051105
 6198  033442  000123
 6199  033444  040442  047502  052122  EM13:   .ASCIZ  /''ABORT IN'' TO TRANSMIT BUFFERS/
 6200  033452  044440  021116  052040
 6201  033460  020117  051124  047101
 6202  033466  046523  052111  041040
 6203  033474  043125  042506  051522
 6204  033502     000
 6205  033503     042  041101  051117  EM14:   .ASCIZ  /''ABORT OUT'' TO RECEIVE BUFFERS/
 6206  033510  020124  052517  021124
 6207  033516  052040  020117  042522
 6208  033524  042503  053111  020105
 6209  033532  052502  043106  051105
 6210  033540  000123
 6211  033542  040442  047502  052122  EM15:   .ASCIZ  /''ABORT OUT'' TO TRANSMIT BUFFERS/
 6212  033550  047440  052125  020042
 6213  033556  047524  052040  040522
 6214  033564  051516  044515  020124
 6215  033572  052502  043106  051105
 6216  033600  000123
 6217  033602  040442  047502  052122  EM16:   .ASCIZ  /''ABORT IN'' TO TRANSMIT BUFFERS/
 6218  033610  044440  021116  052040
 6219  033616  020117  051124  047101
 6220  033624  046523  052111  041040
 6221  033632  043125  042506  051522
 6222  033640     000
 6223  033641     121  042525  044525  EM17:   .ASCIZ  /QUEUING OF ALT. TRANSMIT BUFFERS/
 6224  033646  043516  047440  020106
 6225  033654  046101  027124  052040
 6226  033662  040522  051516  044515
 6227  033670  020124  052502  043106
 6228  033676  051105  000123
 6229  033702  052521  052505  047111  EM20:   .ASCIZ  /QUEUING OF ALT. RECEIVE BUFFERS/
 6230  033710  020107  043117  040440
 6231  033716  052114  020056  042522
 6232  033724  042503  053111  020105
 6233  033732  052502  043106  051105
 6234  033740  000123
 6235  033742  046101  042524  047122  EM21:   .ASCIZ  /ALTERNATE BUFFER DYNAMICS TEST/
 6236  033750  052101  020105  052502
 6237  033756  043106  051105  042040
 6238  033764  047131  046501  041511
 6239  033772  020123  042524  052123
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6240  034000     000
6241  034001     116  046530  051440  EM22:   .ASCIZ  /NXM STATUS TEST/
6242  034006  040524  052524  020123
6243  034014  042524  052123     000
6244  034021     105  041124  023040  EM23:   .ASCIZ  /ETB & ETX TERMINATION TEST/
6245  034026  042440  054124  052040
6246  034034  051105  044515  040516
6247  034042  044524  047117  052040
6248  034050  051505  000124
6249  034054  051114  020103  051105  EM24:   .ASCIZ  /LRC ERROR GENERATION TEST/
6250  034062  047522  020122  042507
6251  034070  042516  040522  044524
6252  034076  047117  052040  051505
6253  034104  000124
6254  034106  040520  044522  054524  EM25:   .ASCIZ  /PARITY ERROR GENERATION TEST/
6255  034114  042440  051122  051117
6256  034122  043440  047105  051105
6257  034130  052101  047511  020116
6258  034136  042524  052123     000
6259  034143     103  040510  040522  EM26:   .ASCIZ  /CHARACTER COUNT TEST/
6260  034150  052103  051105  041440
6261  034156  052517  052116  052040
6262  034164  051505  000124
6263  034170  047514  020127  031461  EM27:   .ASCIZ  /LOW 13 BIT TRM + REC TEST/
6264  034176  041040  052111  052040
6265  034204  046522  025440  051040
6266  034212  041505  052040  051505
6267  034220  000124
6268  034222  042522  042503  053111  EM30:   .ASCIZ  /RECEIVE BUFF. HIGH ORDER BITS (14-17) TEST/
6269  034230  020105  052502  043106
6270  034236  020056  044510  044107
6271  034244  047440  042122  051105
6272  034252  041040  052111  020123
6273  034260  030450  026464  033461
6274  034266  020051  042524  052123
6275  034274     000
6276  034275     124  040522  051516  EM31:   .ASCIZ  /TRANSMIT BUFF HIGH ORDER BITS (14-17) TEST/
6277  034302  044515  020124  052502
6278  034310  043106  044040  043511
6279  034316  020110  051117  042504
6280  034324  020122  044502  051524
6281  034332  024040  032061  030455
6282  034340  024467  052040  051505
6283  034346  000124
6284  034350  0405 4  040524  052040  EM32:   .ASCIZ  /DATA TRANSFER TEST/
6285  034356  0405.2  051516  042506
6286  034364  020122  042524  052123
6287  034372     000
6288  034373     111  050116  052125  EM33:   .ASCIZ  /INPUT INTFRRUPT TEST/
6289  034400  044440  052116  051105
6290  034406  052522  052120  052040
6291  034414  051505  000124
6292  034420  052517  050124  052125  EM34:   .ASCIZ  /OUTPUT INTERRUPT TEST/
6293  034426  044440  052116  051105
6294  034434  052522  052120  052040
6295  034442  051505  000124
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 6296
 6297  034446  047125  052111  021440  DH1:    .ASCIZ  /UNIT #  TEST #  FAIL #  DEV.ADR./
 6298  034454  020040  042524  052123
 6299  034462  021440  020040  040506
 6300  034470  046111  021440  020040
 6301  034476  042504  027126  042101
 6302  034504  027122     000
 6303  034507     125  044516  020124  DH2:    .ASCIZ  /UNIT #  TEST #  FAIL #  SHBE    WAS/
 6304  034514  020043  052040  051505
 6305  034522  020124  020043  043040
 6306  034530  044501  020114  020043
 6307  034536  051440  041110  020105
 6308  034544  020040  053440  051501
 6309  034552     000
 6310  034553     125  044516  020124  DH3:    .ASCIZ  /UNIT #  TEST #  FAIL #  LINE #/
 6311  034560  020043  052040  051505
 6312  034566  020124  020043  043040
 6313  034574  044501  020114  020043
 6314  034602  046040  047111  020105
 6315  034610  000043
 6316  034612  047125  052111  021440  DH4:    .ASCIZ  /UNIT #  TEST #  FAIL #  LINE #  CSR0    CSR2    CSR4    CSR6/
 6317  034620  020040  042524  052123
 6318  034626  021440  020040  040506
 6319  034634  046111  021440  020040
 6320  034642  044514  042516  021440
 6321  034650  020040  051503  030122
 6322  034656  020040  020040  051503
 6323  034664  031122  020040  020040
 6324  034672  051503  032122  020040
 6325  034700  020040  051503  033122
 6326  034706     000
 6327  034707     125  044516  020124  DH5:    .ASCIZ  /UNIT #  TEST #  FAIL #  LINE #  SHBE    CSR0    CSR2    CSR4    CSR6/
 6328  034714  020043  052040  051505
 6329  034722  020124  020043  043040
 6330  034730  044501  020114  020043
 6331  034736  046040  047111  020105
 6332  034744  020043  051440  041110
 6333  034752  020105  020040  041440
 6334  034760  051123  020060  020040
 6335  034766  041440  051123  020062
 6336  034774  020040  041440  051123
 6337  035002  020064  020040  041440
 6338  035010  051123  000066
 6339  035014  047125  052111  021440  DH6:    .ASCIZ  /UNIT #  TEST #  FAIL #  BUFEA   BUFADR  SHBE    WAS/
 6340  035022  020040  042524  052123
 6341  035030  021440  020040  040506
 6342  035036  046111  021440  020040
 6343  035044  052502  042506  020101
 6344  035052  020040  052502  040506
 6345  035060  051104  020040  044123
 6346  035066  042502  020040  020040
 6347  035074  040527  000123
 6348  035100  047125  052111  021440  DH7:    .ASCIZ  /UNIT #  TEST #  FAIL #  T-BUFF  R-BUFF  SHBE    WAS/
 6349  035106  020040  042524  052123
 6350  035114  021440  020040  040506
 6351  035122  046111  021440  020040
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 6352  035130  026524  052502  043106
 6353  035136  020040  026522  052502
 6354  035144  043106  020040  044123
 6355  035152  042502  020040  020040
 6356  035160  040527  000123
 6357  035164  047125  052111  021440  DH10:   .ASCIZ  /UNIT #  TEST #  FAIL #  LINE #  CUR-EA  CUR-ADR SHBE    WAS/
 6358  035172  020040  042524  052123
 6359  035200  021440  020040  040506
 6360  035206  046111  021440  020040
 6361  035214  044514  042516  021440
 6362  035222  020040  052503  026522
 6363  035230  040505  020040  052503
 6364  035236  026522  042101  020122
 6365  035244  044123  042502  020040
 6366  035252  020040  040527  000123
 6367  035260  047125  052111  021440  DH11:   .ASCIZ  /UNIT #  TEST #  FAIL #  SHBE    WAS [redacted]CSR0    CSR2    CSR4    CSR6/
 6368  035266  020040  042524  052123
 6369  035274  021440  020040  040506
 6370  035302  046111  021440  020040
 6371  035310  044123  042502  020040
 6372  035316  020040  040527  020123
 6373  035324  020040  020040  051503
 6374  035332  030122  020040  020040
 6375  035340  051503  031122  020040
 6376  035346  020040  051503  032122
 6377  035354  020040  020040  051503
 6378  035362  033122     000
 6379  035365     125  044516  020124  DH12:   .ASCIZ  /UNIT #  TEST #  FAIL #  WAS   CSR0   CSR2   CSR4  CSR6/
 6380  035372  020043  052040  051505
 6381  035400  020124  020043  043040
 6382  035406  044501  020114  020043
 6383  035414  053440  051501  020040
 6384  035422  041440  051123  020060
 6385  035430  020040  051503  031122
 6386  035436  020040  041440  051123
 6387  035444  020064  041440  051123
 6388  035452  000066
 6389  035454  047125  052111  021440  DH13:   .ASCIZ  /UNIT #  TEST #  FAIL #  LINE #  T-BUFF  SHBE    CSR2    CSR4    CSR6/
 6390  035462  020040  042524  052123
 6391  035470  021440  020040  040506
 6392  035476  046111  021440  020040
 6393  035504  044514  042516  021440
 6394  035512  020040  026524  052502
 6395  035520  043106  020040  044123
 6396  035526  042502  020040  020040
 6397  035534  051503  031122  020040
 6398  035542  020040  051503  032122
 6399  035550  020040  020040  051503
 6400  035556  033122     000
 6401          035562                  .EVEN
 6402  035562  002456  002460  002452  DT1:    .WORD   CUNIT,TSTNUM,ERNUM,SEL0,0
 6403  035570  002260  000000
 6404  035574  002456  002460  002452  DT2:    .WORD   CUNIT,TSTNUM,ERNUM,SHBE,WAS,0
 6405  035602  002462  002464  000000
 6406  035610  002456  002460  002452  DT3:    .WORD   CUNIT,TSTNUM,ERNUM,CURLIN,0
 6407  035616  002454  000000
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6408  035622  002456  002460  002452  DT4:    .WORD   CUNIT,TSTNUM,ERNUM,CURLIN,CSR0,CSR2,CSR4,CSR6,0
6409  035630  002454  002342  002344
6410  035636  002346  002350  000000
6411  035644  002456  002460  002452  DT5:    .WORD   CUNIT,1STNUM,ERNUM,CURLIN,SHBE,CSR0,CSR2,CSR4,CSR6,0
6412  035652  002454  002462  002342
6413  035660  002344  002346  002350
6414  035666  000000
6415  035670  002456  002460  002452  DT6:    .WORD   CUNIT,TSTNUM,ERNUM,RECBUF,SHBE,WAS,0
6416  035676  002506  002462  002464
6417  035704  000000
6418  035706  002456  002460  002452  DT7:    .WORD   CUNIT,TSTNUM,ERNUM,XOUT,ROUT,SHBE,WAS,0
6419  035714  002466  002470  002462
6420  035722  002464  000000
6421  035726  002456  002460  002452  DT10:   .WORD   CUNIT,TSTNUM,ERNUM,CURLIN,CUREA,CURBUF,SHBE,WAS,0
6422  035734  002454  002476  002500
6423  035742  002462  002464  000000
6424  035750  002456  002460  002452  DT11:   .WORD   CUNIT,TSTNUM,ERNUM,SHBE,WAS,CSR0,CSR2,CSR4,CSR6,0
6425  035756  002462  002464  002342
6426  035764  002344  002346  002350
6427  035772  000000
6428  035774  002456  002460  002452  DT12:   .WORD   CUNIT,TSTNUM,ERNUM,WAS,CSR0,CSR2,CSR4,CSR6,0
6429  036002  002464  002342  002344
6430  036010  002346  002350  000000
6431  036016  002456  002460  002452  DT13:   .WORD   CUNIT,TSTNUM,ERNUM,CURLIN,XOUT,SHBE,CSR2,CSR4,CSR6,0
6432  036024  002454  002466  002462
6433  036032  002344  002346  002350
6434  036040  000000
6435  036042  000001  000000  000000  DF1:    .WORD   1,0,0,0,0,0,0
6436  036050  000000  000000  000000
6437  036056  000000
6438  036060                          CCPFRM:
6439  036060  016777  123200  060520          .WORD   016777,123200,060520,103405,100400,000423,063230,000401
6440  036066  103405  100400  000423
6441  036074  063230  000401
6442  036100  063233  000402  063232          .WORD   063233,000402,063232,000777,063231,010001,004002,016403
6443  036106  000777  063231  010001
6444  036114  004002  016403
6445  036120  016403  004003  016601          .WORD   016403,004003,016601,016602,016777,016626,016427,016403
6446  036126  016602  016777  016626
6447  036134  016427  016403
6448  036140  016406  016634  016625          .WORD   016406,016634,016625,016422,016436,016421,016405,016430
6449  036146  016422  016436  016421
6450  036154  016405  016430
6451  036160  016607  016435  016424          .WORD   016607,016435,016424,000400,061220,061222,110422,000560
6452  036166  000400  061220  061222
6453  036174  110422  000560
6454  036200  063236  004400  073237          .WORD   063236,004400,073237,062231,047634,102473,020661,106532
6455  036206  062231  047634  102473
6456  036214  020661  106532
6457  036220  102076  004420  073016          .WORD   102076,004420,073016,047634,020660,113745,113213,004420
6458  036226  047634  020660  113745
6459  036234  113213  004420
6460  036240  073417  103446  100453          .WORD   073417,103446,100453,004420,063016,100470,002012,000400
6461  036246  004420  063016  100470
6462  036254  002012  000400
6463  036260  063223  057235  023601          .WORD   063223,057235,023601,063222,061620,061620,061620,061620
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 6467  036306  063721  061620  063721
 6468  036314  140632  102140
 6469  036320  010003  004003  054362          .WORD   010003,004003,054362,101544,054362,101544,054362,101461
 6470  036326  101544  054362  101544
 6471  036334  054362  101461
 6472  036340  054362  101461  014412          .WORD   054362,101461,014412,077223,054362,101553,063163,101134
 6473  036346  077223  054362  101553
 6474  036354  063163  101134
 6475  036360  060602  063223  000402          .WORD   060602,063223,000402,104543,070217,064214,074615,107553
 6476  036366  104543  070217  064214
 6477  036374  074615  107553
 6478  036400  016575  016400  100772          .WORD   016575,016400,100772,070217,064214,014414,002562,070017
 6479  036406  070217  064214  014414
 6480  036414  002562  070017
 6481  036420  062602  100461  002517          .WORD   062602,100461,002517,000414,070017,040362,101572,000410
 6482  036426  000414  070017  040362
 6483  036434  101572  000410
 6484  036440  043223  104543  043223          .WORD   043223,104543,043223,000401,104572,102201,016606,060615
 6485  036446  000401  104572  102201
 6486  036454  016606  060615
 6487  036460  100724  016517  014420          .WORD   100724,016517,014420,043223,104543,104543,102323,004003
 6488  036466  043223  104543  104543
 6489  036474  102323  004003
 6490  036500  010006  054362  101461          .WORD   010006,054362,101461,054362,101713,054362,101717,003004
 6491  036506  054362  101713  054362
 6492  036514  101717  003004
 6493  036520  054362  101704  063164          .WORD   054362,101704,063164,101220,070077,064214,060615,107553
 6494  036526  101220  070077  064214
 6495  036534  060615  107553
 6496  036540  014775  077225  060615          .WORD   014775,077225,060615,103241,060602,062223,000402,063221
 6497  036546  103241  060602  062223
 6498  036554  000402  063221
 6499  036560  104424  062602  104423          .WORD   104424,062602,104423,016517,054362,101650,000774,104416
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 6501  036574  000774  104416
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 6504  036614  104416  000402
 6505  036620  104416  002606  000414          .WORD   104416,002606,000414,070017,040362,101670,043222,100624
 6506  036626  070017  040362  101670
 6507  036634  043222  100624
 6508  036640  000401  043223  104572          .WORD   000401,043223,104572,023301,000776,063661,062234,060461
 6509  036646  023301  000776  063661
 6510  036654  062234  060461
 6511  036660  062234  000772  063225          .WORD   062234,000772,063225,104476,070077,064234,002661,000414
 6512  036666  104476  070077  064234
 6513  036674  002661  000414
 6514  036700  070017  062602  100461          .WORD   070017,062602,100461,070077,064214,002643,100722,070077
 6515  036706  070077  064214  002643
 6516  036714  100722  070077
 6517  036720  064214  002652  063163          .WORD   064214,002652,063163,074615,056722,107553,103372,056222
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 6519  036734  103372  056222
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 6522  036754  057222  123221
 6523  036760  054661  060702  061231          .WORD   054661,060702,061231,055230,060603,101752,056411,101352
 6524  036766  055230  060603  101752
 6525  036774  056411  101352
 6526  037000  056411  105454  000420          .WORD   056411,105454,000420,070217,062735,120600,102355,120620
 6527  037006  070217  062735  120600
 6528  037014  102355  120620
 6529  037020  106007  100461  042227          .WORD   106007,100461,042227,056413,101366,100736,043222,000404
 6530  037026  056413  101366  100736
 6531  037034  043222  000404
 6532  037040  076402  100737  076602          .WORD   076402,100737,076602,000411,070017,060603,105403,056411
 6533  037046  000411  070017  060603
 6534  037054  105403  056411
 6535  037060  105003  056411  105454          .WORD   105003,056411,105454,070217,000420,062735,100461,063225
 6536  037066  070217  000420  062735
 6537  037074  100461  063225
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 6540  037114  063225  060615
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 6542  037126  003001  056222  042226
 6543  037134  056401  105044
 6544  037140  056227  057222  123221          .WORD   056227,057222,123221,054661,060702,061231,055230,120600
 6545  037146  054661  060702  061231
 6546  037154  055230  120600
 6547  037160  106037  120620  106007          .WORD   106037,120620,106007,104476,042227,056413,105050,104431
 6548  037166  104476  042227  056413
 6549  037174  105050  104431
 6550  037200  043222  000404  076402          .WORD   043222,000404,076402,104432,070217,014401,063225,057221
 6551  037206  104432  070217  014401
 6552  037214  063225  057221
 6553  037220  057222  070217  000401          .WORD   057222,070217,000401,064334,074615,076601,076602,064214
 6554  037226  064334  074615  076601
 6555  037234  076602  064214
 6556  037240  107023  120600  106071          .WORD   107023,120600,106071,120620,106007,104476,004620,070217
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 6558  037254  004620  070217
 6559  037260  042733  064214  043221          .WORD   042733,064214,043221,076701,016517,016400,014410,057221
 6560  037266  076701  016517  016400
 6561  037274  014410  057221
 6562  037300  057222  057223  004002          .WORD   057222,057223,004002,010000,056413,043227,062407,070207
 6563  037306  010000  056413  043227
 6564  037314  062407  070207
 6565  037320  076617  016604  076601          .WORD   076617,016604,076601,076602,076603,062605,100461,000776
 6566  037326  076602  076603  062605
 6567  037334  100461  000776
 6568  037340  063225  104476  023301          .WORD   063225,104476,023301,000776,063661,062234,060461,062234
 6569  037346  000776  063661  062234
 6570  037354  060461  062234
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 6572  037366  063225  023301  000776
 6573  037374  063661  062234
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 6579  037434  062234  060461
 6580  037440  062234  100461  063225          .WORD   062234,100461,063225,000410,004002,010000,056413,043224
 6581  037446  000410  004002  010000
 6582  037454  056413  043224
 6583  037460  062404  070204  076617          .WORD   062404,070204,076617,016405,076603,076602,016400,076605
 6584  037466  016405  076603  076602
 6585  037474  016400  076605
 6586  037500  100461  043620  106614          .WORD   100461,043620,106614,110556,002720,004001,016621,002517
 6587  037506  110556  002720  004001
 6588  037514  016621  002517
 6589  037520  004600  002517  070017          .WORD   004600,002517,070017,016600,002400,004001,002400,070017
 6590  037526  016600  002400  004001
 6591  037534  002400  070017
 6592  037540  002601  000611  070317          .WORD   002601,000611,070317,064617,062231,002635,000673,062232
 6593  037546  064617  062231  002635
 6594  037554  000673  062232
 6595  037560  000547  062230  060220          .WORD   000547,062230,060220,000400,002372,062230,060220,000626
 6596  037566  000400  002372  062230
 6597  037574  060220  000626
 6598  037600  002232  062230  000421          .WORD   002232,062230,000421,062234,000401,002172,062230,110556
 6599  037606  062234  000401  002172
 6600  037614  062230  110556
 6601  037620  123561  107214  061620          .WORD   123561,107214,061620,106272,106671,061620,106711,060521
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 6603  037634  106711  060521
 6604  037640  107723  110556  120400          .WORD   107723,110556,120400,061620,106704,070216,047634,043635
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 6606  037654  047634  043635
 6607  037660  113556  000500  062715          .WORD   113556,000500,062715,110556,047634,057635,113556,002673
 6608  037666  110556  047634  057635
 6609  037674  113556  002673
 6610  037700  110556  070216  043634          .WORD   110556,070216,043634,113156,000420,062714,000412,070016
 6611  037706  113156  000420  062714
 6612  037714  000412  070016
 6613  037720  136500  122520  110556          .WORD   136500,122520,110556,123141,000437,063222,000740,063261
 6614  037726  123141  000437  063222
 6615  037734  000740  063261
 6616  037740  020700  060662  060701          .WORD   020700,060662,060701,062234,110556,061620,106740,070216
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 6618  037754  106740  070216
 6619  037760  047634  112556  043635          .WORD   047634,112556,043635,107750,064333,043635,107750,110556
 6620  037766  107750  064333  043635
 6621  037774  107750  110556
 6622  040000  000423  076675  120400          .WORD   000423,076675,120400,061620,112405,016400,136500,136520
 6623  040006  061620  112405  016400
 6624  040014  136500  136520
 6625  040020  123160  000700  063260          .WORD   123160,000700,063260,063120,063140,063140,063120,076520
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 6627  040034  063120  076520
 6628  040040  123141  000437  076561          .WORD   123141,000437,076561,111002,123160,063260,063160,076660
 6629  040046  111002  123160  063260
 6630  040054  063160  076660
 6631  040060  123160  110556  123160          .WORD   123160,110556,123160,076660,110556,137160,014700,077260
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 6635  040106  063120  136500  136520
 6636  040114  076520  016500
 6637  040120  016421  104770  170610          .WORD   016421,104770,170610,004002,010000,043620,111514,076560
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 6639  040134  111514  076560
 6640  040140  014410  043225  062405          .WORD   014410,043225,062405,070205,054620,061620,061620,061620
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 6643  040160  061620  061223  057625          .WORD   061620,061223,057625,112103,113457,054411,061224,111060
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 6645  040174  061224  111060
 6646  040200  054411  061225  111061          .WORD   054411,061225,111061,057221,000404,060741,110462,055224
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 6648  040214  110462  055224
 6649  040220  055225  054620  061620          .WORD   055225,054620,061620,061620,061620,061620,061227,055226
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 6651  040234  061227  055226
 6652  040240  003360  120440  060660          .WORD   003360,120440,060660,063305,000600,060705,061222,060525
 6653  040246  063305  000600  060705
 6654  040254  061222  060525
 6655  040260  113510  000604  110611          .WORD   113510,000604,110611,055224,055225,055226,055227,110470
 6656  040266  055224  055225  055226
 6657  040274  055227  110470
 6658  040300  123620  000700  061311          .WORD   123620,000700,061311,110501,123400,061620,113120,100447
 6659  040306  110501  123400  061620
 6660  040314  113120  100447
 6661  040320  000600  061300  060520          .WORD   000600,061300,060520,113526,000532,110611,000600,061231
 6662  040326  113526  000532  110611
 6663  040334  000600  061231
 6664  040340  000575  110611  123400          .WORD   000575,110611,123400,061620,113163,123077,000407,063277
 6665  040346  061620  113163  123077
 6666  040354  000407  063277
 6667  040360  063137  063137  063137          .WORD   063137,063137,063137,073537,062231,004600,060417,063236
 6668  040366  073537  062231  004600
 6669  040374  060417  063236
 6670  040400  120400  112154  112556          .WORD   120400,112154,112556,104735,106611,104660,123000,000500
 6671  040406  104735  106611  104660
 6672  040414  123000  000500
 6673  040420  061260  000423  110611          .WORD   061260,000423,110611,060600,113566,110514,060520,113571
 6674  040426  060600  113566  110514
 6675  040434  060520  113571
 6676  040440  100447  000600  061231          .WORD   100447,000600,061231,000575,110611,123400,061620,113201
 6677  040446  000575  110611  123400
 6678  040454  061620  113201
 6679  040460  110535  060600  103447          .WORD   110535,060600,103447,110514,123440,103447,000500,061262
 6680  040466  110514  123440  103447
 6681  040474  000500  061262
 6682  040500  000423  063230  100447          .WORD   000423,063230,100447,057635,154632,000401,070016,002671
 6683  040506  057635  154632  000401
 6684  040514  070016  002671
 6685  040520  000407  070016  120600          .WORD   000407,070016,120600,112222,120620,112337,022420,023002
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 6687  040534  022420  023002
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 6690  040554  043222  110773
 6691  040560  016635  016132  042230          .WORD   016635,016132,042230,070216,000420,062734,110714,063225
 6692  040566  070216  000420  062734
 6693  040574  110714  063225
 6694  040600  002172  000401  062230          .WORD   002172,000401,062230,110661,002172,000402,062230,000772
 6695  040606  110661  002172  000402
 6696  040614  062230  000772
 6697  040620  063225  007200  070216          .WORD   063225,007200,070216,042733,064214,056700,016400,057221
 6698  040626  042733  064214  056700
 6699  040634  016400  057221
 6700  040640  057222  057223  054220          .WORD   057222,057223,054220,054620,112276,003000,004002,010000
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 6702  040654  004002  010000
 6703  040660  056413  043224  000410          .WORD   056413,043224,000410,062404,070204,076617,076600,076601
 6704  040666  062404  070204  076617
 6705  040674  076600  076601
 6706  040700  076602  076603  062605          .WORD   076602,076603,062605,100467,000420,063221,070216,004000
 6707  040706  100467  000420  063221
 6708  040714  070216  004000
 6709  040720  042721  004002  010000          .WORD   042721,004002,010000,056413,043224,000410,062404,070204
 6710  040726  056413  043224  000410
 6711  040734  062404  070204
 6712  040740  076617  016401  016400          .WORD   076617,016401,016400,016400,016400,002401,100467,063225
 6713  040746  016400  016400  002401
 6714  040754  100467  063225
 6715  040760  000500  060665  061231          .WORD   000500,060665,061231,000773,110647,000777,110647,063225
 6716  040766  000773  110647  000777
 6717  040774  110647  063225
 6718  041000  060602  063221  061620          .WORD   060602,063221,061620,061620,061620,061620,063721,061620
 6719  041006  061620  061620  061620
 6720  041014  063721  061620
 6721  041020  061620  063721  061620          .WORD   061620,063721,061620,063721,000600,060661,060725,063322
 6722  041026  063721  000600  060661
 6723  041034  060725  063322
 6724  041040  000410  070016  042722          .WORD   000410,070016,042722,002132,060602,062230,100467,060220
 6725  041046  002132  060602  062230
 6726  041054  100467  060220
 6727  041060  060614  117312  060615          .WORD   060614,117312,060615,103467,016411,002172,000401,062230
 6728  041066  103467  016411  002172
 6729  041074  000401  062230
 6730  041100  100467  016465  000402          .WORD   100467,016465,000402,070016,042224,056412,043621,062225
 6731  041106  070016  042224  056412
 6732  041114  043621  062225
 6733  041120  076501  043221  115062          .WORD   076501,043221,115062,074461,061230,056411,115033,042411
 6734  041126  074461  061230  056411
 6735  041134  115033  042411
 6736  041140  115033  000767  110660          .WORD   115033,000767,110660,120600,116033,120620,112337,034400
 6737  041146  120600  116033  120620
 6738  041154  112337  034400
 6739  041160  022420  003201  060361          .WORD   022420,003201,060361,115452,003202,060362,115452,000401
 6740  041166  115452  003202  060362
 6741  041174  115452  000401
 6742  041200  070016  002671  002132          .WORD   070016,002671,002132,020400,062230,060220,002172,000400
 6743  041206  020400  062230  060220
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 6744  041214  002172  000400
 6745  041220  062230  100467  000404          .WORD   062230,100467,000404,062401,114423,002505,000405,070016
 6746  041226  062401  114423  002505
 6747  041234  000405  070016
 6748  041240  056411  115077  056411          .WORD   056411,115077,056411,115077,000401,070016,002621,000407
 6749  041246  115077  000401  070016
 6750  041254  002621  000407
 6751  041260  070016  057222  002400          .WORD   070016,057222,002400,000400,110747,060614,113231,060535
 6752  041266  000400  110747  060614
 6753  041274  113231  060535
 6754  041300  113654  000402  070016          .WORD   113654,000402,070016,042224,056412,043621,062225,076501
 6755  041306  042224  056412  043621
 6756  041314  062225  076501
 6757  041320  043221  115165  074461          .WORD   043221,115165,074461,061230,056411,115143,042411,115143
 6758  041326  061230  056411  115143
 6759  041334  042411  115143
 6760  041340  042411  000401  070016          .WORD   042411,000401,070016,002621,120600,116134,120620,112337
 6761  041346  002621  120600  116134
 6762  041354  120620  112337
 6763  041360  023002  000400  110747          .WORD   023002,000400,110747,000401,070016,002570,000407,070016
 6764  041366  000401  070016  002570
 6765  041374  000407  070016
 6766  041400  120600  116150  120620          .WORD   120600,116150,120620,112337,022420,023002,000613,060762
 6767  041406  112337  022420  023002
 6768  041414  000613  060762
 6769  041420  115563  000600  110747          .WORD   115563,000600,110747,000400,110747,000404,062401,114522
 6770  041426  000400  110747  000404
 6771  041434  062401  114522
 6772  041440  060614  113231  060535          .WORD   060614,113231,060535,113654,002505,000405,070016,056411
 6773  041446  113654  002505  000405
 6774  041454  070016  056411
 6775  041460  115210  056411  115211          .WORD   115210,056411,115211,043222,000401,070016,002621,114617
 6776  041466  043222  000401  070016
 6777  041474  002621  114617
 6778  041500  054220  043222  000613          .WORD   054220,043222,000613,060762,115617,000600,114620,000400
 6779  041506  060762  115617  000600
 6780  041514  114620  000400
 6781  041520  110747  002626  000410          .WORD   110747,002626,000410,070016,043222,110773,016745,002172
 6782  041526  070016  043222  110773
 6783  041534  016745  002172
 6784  041540  000402  062230  100467          .WORD   000402,062230,100467,060535,113654,000402,070016,042224
 6785  041546  060535  113654  000402
 6786  041554  070016  042224
 6787  041560  056412  043621  062225          .WORD   056412,043621,062225,076501,043221,115266,074461,061230
 6788  041566  076501  043221  115266
 6789  041574  074461  061230
 6790  041600  056411  111215  042411          .WORD   056411,111215,042411,111215,042411,000401,070016,002626
 6791  041606  111215  042411  000401
 6792  041614  070016  002626
 6793  041620  120600  116260  120620          .WORD   120600,116260,120620,112337,023002,110773,000404,062401
 6794  041626  112337  023002  110773
 6795  041634  000404  062401
 6796  041640  114646  060535  113654          .WORD   114646,060535,113654,002633,000405,070016,056411,115307
 6797  041646  002633  000405  070016
 6798  041654  056411  115307
 6799  041660  056411  115310  043222          .WORD   056411,115310,043222,000401,070016,002626,110773,054220
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 6800  041666  000401  070016  002626
 6801  041674  110773  054220
 6802  041700  043222  110773  002717          .WORD   043222,110773,002717,002172,000401,062230,100467,002732
 6803  041706  002172  000401  062230
 6804  041714  100467  002732
 6805  041720  004000  000412  070016          .WORD   004000,000412,070016,002132,042230,040222,000400,002172
 6806  041726  002132  042230  040222
 6807  041734  000400  002172
 6808  041740  062230  100467  016740          .WORD   062230,100467,016740,004000,000413,070016,043222,110773
 6809  041746  004000  000413  070016
 6810  041754  043222  110773
 6811  041760  016400  002172  000402          .WORD   016400,002172,000402,062230,110714,060535,117751,000401
 6812  041766  062230  110714  060535
 6813  041774  117751  000401
 6814  042000  110660  000766  110660          .WORD   110660,000766,110660,000000,000000,000000,000000,000000
 6815  042006  000000  000000  000000
 6816  042014  000000  000000
 6817  042020  001007  114761  001027          .WORD   001007,114761,001027,114763,001047,114765,001067,114767
 6818  042026  114763  001047  114765
 6819  042034  001067  114767
 6820  042040  001107  114771  001127          .WORD   001107,114771,001127,114773,001147,114775,001167,114777
 6821  042046  114773  001147  114775
 6822  042054  001167  114777
 6823  042060                          CCPEND:
 6824
 6825
 6826
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6827  042060                                BOPW32:
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6829  042060  016777  123200  060520              .WORD   016777,123200,060520,103405,100400,000401,063230,000401
6830  042066  103405  100400  000401
6831  042074  063230  000401
6832  042100  063227  000402  063226              .WORD   063227,000402,063226,000777,063231,010001,004002,016403
6833  042106  000777  063231  010001
6834  042114  004002  016403
6835  042120  002403  000400  061220              .WORD   002403,000400,061220,061222,114400,000560,063236,004400
6836  042126  061222  114400  000560
6837  042134  063236  004400
6838  042140  073237  062231  047634              .WORD   073237,062231,047634,102451,020660,102054,102606,004420
6839  042146  102451  020660  102054
6840  042154  102606  004420
6841  042160  073016  047634  020660              .WORD   073016,047634,020660,107664,107003,004420,073417,103424
6842  042166  107664  107003  004420
6843  042174  073417  103424
6844  042200  10043'  004420  063016              .WORD   100431,004420,063016,100446,020660,102606,002012,057635
6845  042206  100446  020660  102606
6846  042214  002012  057635
6847  042220  103715  140620  000403              .WORD   103715,140620,000403,070017,056406,101070,070077,100477
6848  042226  070017  056406  101070
6849  042234  070077  100477
6850  042240  056407  101073  100466              .WORD   056407,101073,100466,043220,000404,076400,100466,016505
6851  042246  043220  000404  076400
6852  042254  100466  016505
6853  042260  036600  000420  070217              .WORD   036600,000420,070217,062735,100437,016462,056222,022203
6854  042266  062735  100437  016462
6855  042274  056222  022203
6856  042300  056226  056227  057220              .WORD   056226,056227,057220,123221,054661,061311,055230,056411
6857  042306  123221  054661  061311
6858  042314  055230  056411
6859  042320  101123  056411  101631              .WORD   101123,056411,101631,000420,070217,062735,120600,102126
6860  042326  000420  070217  062735
6861  042334  120600  102126
6862  042340  120620  102374  100437              .WORD   120620,102374,100437,003000,016462,036600,004600,070217
6863  042346  003000  016462  036600
6864  042354  004600  070217
6865  042360  042727  064214  043221              .WORD   042727,064214,043221,062701,004002,010000,056407,043224
6866  042366  062701  004002  010000
6867  042374  056407  043224
6868  042400  000410  062404  070204              .WORD   000410,062404,070204,016604,076617,076614,076600,016400
6869  042406  016604  076617  076614
6870  042414  076600  016400
6871  042420  000401  062620  100437              .WORD   000401,062620,100437,016601,022600,000403,070017,056406
6872  042426  016601  022600  000403
6873  042434  070017  056406
6874  042440  101172  100501  056407              .WORD   101172,100501,056407,101175,100571,043220,000404,076400
6875  042446  101175  100571  043220
6876  042454  000404  076400
6877  042460  100571  023200  100536              .WORD   100571,023200,100536,016601,036600,100501,002052,057635
6878  042466  016601  036600  100501
6879  042474  002052  057635
6880  042500  103621  023605  060525              .WORD   103621,023605,060525,103302,060605,061620,102623,102244
6881  042506  103302  060605  061620
6882  042514  102623  102244
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 6883  042520  100437  020200  100715          .WORD   100437,020200,100715,000771,063224,000420,070217,076715
 6884  042526  000771  063224  000420
 6885  042534  070217  076715
 6886  042540  100750  120600  102231          .WORD   100750,120600,102231,120620,102374,057625,070077,103242
 6887  042546  120620  102374  057625
 6888  042554  070077  103242
 6889  042560  002533  100501  002563          .WORD   002533,100501,002563,100501,002012,074615,023204,103251
 6890  042566  100501  002012  074615
 6891  042574  023204  103251
 6892  042600  062604  003200  070217          .WORD   062604,003200,070217,042700,004000,056727,004002,010000
 6893  042606  042700  004000  056727
 6894  042614  004002  010000
 6895  042620  000410  056407  043220          .WORD   000410,056407,043220,062400,070200,016604,076617,076614
 6896  042626  062400  070200  016604
 6897  042634  076617  076614
 6898  042640  076604  076605  023700          .WORD   076604,076605,023700,102676,002402,100437,002774,000773
 6899  042646  102676  002402  100437
 6900  042654  002774  000773
 6901  042660  062274  100437  023300          .WORD   062274,100437,023300,000770,062274,000776,063224,000420
 6902  042666  000770  062274  000776
 6903  042674  063224  000420
 6904  042700  070217  076715  000771          .WORD   070217,076715,000771,062274,100750,023300,000770,062274
 6905  042706  062274  100750  023300
 6906  042714  000770  062274
 6907  042720  000771  062274  060615          .WORD   000771,062274,060615,061620,103037,070217,000440,062715
 6908  042726  061620  103037  070217
 6909  042734  000440  062715
 6910  042740  000404  063225  000410          .WORD   000404,063225,000410,004002,010000,056407,043224,062404
 6911  042746  004002  010000  056407
 6912  042754  043224  062404
 6913  042760  070204  016405  076617          .WORD   070204,016405,076617,016400,016400,016400,076605,100437
 6914  042766  016400  016400  016400
 6915  042774  076605  100437
 6916  043000  004600  070217  042727          .WORD   004600,070217,042727,064214,043221,076701,000410,004002
 6917  043006  064214  043221  076701
 6918  043014  000410  004002
 6919  043020  010000  056407  043220          .WORD   010000,056407,043220,062400,070200,016404,076617,076614
 6920  043026  062400  070200  016404
 6921  043034  076617  076614
 6922  043040  016400  016400  062604          .WORD   016400,016400,062604,100437,063204,000500,060664,061231
 6923  043046  100437  063204  000500
 6924  043054  060664  061231
 6925  043060  000773  063224  100750          .WORD   000773,063224,100750,057635,103445,147232,016132,056230
 6926  043066  057635  103445  147232
 6927  043074  016132  056230
 6928  043100  000420  070216  062735          .WORD   000420,070216,062735,100445,062233,016447,016172,014401
 6929  043106  100445  062233  016447
 6930  043114  016172  014401
 6931  043120  062230  042224  056406          .WORD   062230,042224,056406,105037,056225,055230,000402,070016
 6932  043126  105037  056225  055230
 6933  043134  000402  070016
 6934  043140  120600  106030  120620          .WORD   120600,106030,120620,106652,036400,036420,100445,042225
 6935  043146  106652  036400  036420
 6936  043154  100445  042225
 6937  043160  056407  105043  104425          .WORD   056407,105043,104425,041230,003004,056404,104426,016464
 6938  043166  041230  003004  056404
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6939  043174  104426  016464
6940  043200  002132  056230  000400          .WORD   002132,056230,000400,060220,002172,062230,100445,016574
6941  043206  060220  002172  062230
6942  043214  100445  016574
6943  043220  104450  062233  016457          .WORD   104450,062233,016457,104416,016132,054220,056230,042224
6944  043226  104416  016132  054220
6945  043234  056230  042224
6946  043240  056406  105123  056225          .WORD   056406,105123,056225,055230,056411,105100,042411,105512
6947  043246  055230  056411  105100
6948  043254  042411  105512
6949  043260  070216  000420  076735          .WORD   070216,000420,076735,134600,106114,120620,106652,036400
6950  043266  134600  106114  120620
6951  043274  106652  036400
6952  043300  036420  100445  070076          .WORD   036420,100445,070076,016533,120600,106114,120620,106652
6953  043306  016533  120600  106114
6954  043314  120620  106652
6955  043320  036400  036420  100445          .WORD   036400,036420,100445,042225,056407,105127,104473,041230
6956  043326  042225  056407  105127
6957  043334  104473  041230
6958  043340  003004  056404  104474          .WORD   003004,056404,104474,016574,043221,000411,070016,043622
6959  043346  016574  043221  000411
6960  043354  070016  043622
6961  043360  107170  002372  063122          .WORD   107170,002372,063122,063122,063522,062602,060522,062230
6962  043366  063122  063522  062602
6963  043374  060522  062230
6964  043400  060220  060601  002132          .WORD   060220,060601,002132,062230,000402,060220,002172,062230
6965  043406  062230  000402  060220
6966  043414  002172  062230
6967  043420  070216  054620  061620          .WORD   070216,054620,061620,107166,002615,100445,002603,100445
6968  043426  107166  002615  100445
6969  043434  002603  100445
6970  043440  002132  060601  062230          .WORD   002132,060601,062230,100445,054220,054220,057221,000411
6971  043446  100445  054220  054220
6972  043454  057221  000411
6973  043460  070016  043222  104541          .WORD   070016,043222,104541,016610,002172,000401,062230,100445
6974  043466  016610  002172  000401
6975  043474  062230  100445
6976  043500  002615  002172  000401          .WORD   002615,002172,000401,062230,100445,007200,070216,042727
6977  043506  062230  100445  007200
6978  043514  070216  042727
6979  043520  064214  056700  000411          .WORD   064214,056700,000411,070016,043225,004002,010000,056407
6980  043526  070016  043225  004002
6981  043534  010000  056407
6982  043540  043224  000410  062404          .WORD   043224,000410,062404,070204,016400,076617,076614,054220
6983  043546  070204  016400  076617
6984  043554  076614  054220
6985  043560  076605  023700  061620          .WORD   076605,023700,061620,106646,002401,100445,002774,000775
6986  043566  106646  002401  100445
6987  043574  002774  000775
6988  043600  062274  100445  063224          .WORD   062274,100445,063224,000500,060664,061231,000773,063224
6989  043606  000500  060664  061231
6990  043614  000773  063224
6991  043620  002172  000404  062230          .WORD   002172,000404,062230,104673,002172,000777,063224,000401
6992  043626  104673  002172  000777
6993  043634  063224  000401
6994  043640  062230  043635  103445          .WORD   062230,043635,103445,007200,070216,042727,064214,056700
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 6997  043660  004002  010000  056407          .WORD   004002,010000,056407,043220,000410,062400,070200,016400
 6998  043666  043220  000410  062400
 6999  043674  070200  016400
 7000  043700  076617  076614  054220          .WORD   076617,076614,054220,016400,062604,100445,043620,106721
 7001  043706  016400  062604  100445
 7002  043714  043620  106721
 7003  043720  114673  002740  004001          .WORD   114673,002740,004001,002701,004600,070017,002700,004001
 7004  043726  002701  004600  070017
 7005  043734  002700  004001
 7006  043740  002701  000673  062232          .WORD   002701,000673,062232,000407,062230,060220,000400,002372
 7007  043746  000407  062230  060220
 7008  043754  000400  002372
 7009  043760  062230  000431  062234          .WORD   062230,000431,062234,114673,123561,107321,061620,112000
 7010  043766  114673  123561  107321
 7011  043774  061620  112000
 7012  044000  106754  060521  113472          .WORD   106754,060521,113472,114673,004002,010000,056407,043220
 7013  044006  114673  004002  010000
 7014  044014  056407  043220
 7015  044020  000410  062400  070200          .WORD   000410,062400,070200,016405,076617,016400,016400,023260
 7016  044026  016405  076617  016400
 7017  044034  016400  023260
 7018  044040  000410  060660  061620          .WORD   000410,060660,061620,061620,061620,076620,002410,114673
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 7020  044054  002410  114673
 7021  044060  120400  061620  112436          .WORD   120400,061620,112436,070216,047234,043635,117673,002172
 7022  044066  070216  047234  043635
 7023  044074  117673  002172
 7024  044100  000404  062230  000772          .WORD   000404,062230,000772,063224,007200,042727,064214,056700
 7025  044106  063224  007200  042727
 7026  044114  064214  056700
 7027  044120  004002  010000  056407          .WORD   004002,010000,056407,043220,000410,062400,070200,016400
 7028  044126  043220  000410  062400
 7029  044134  070200  016400
 7030  044140  076617  076614  016400          .WORD   076617,076614,016400,016400,016772,114673,047234,043635
 7031  044146  016400  016772  114673
 7032  044154  047234  043635
 7033  044160  117673  000776  023301          .WORD   117673,000776,023301,063661,062234,060461,062234,004600
 7034  044166  063661  062234  060461
 7035  044174  062234  004600
 7036  044200  042727  064214  043221          .WORD   042727,064214,043221,076701,014410,004002,010000,056407
 7037  044206  076701  014410  004002
 7038  044214  010000  056407
 7039  044220  043220  062400  070200          .WORD   043220,062400,070200,016404,076617,076614,016400,016400
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 7042  044240  016772  114673  123141          .WORD   016772,114673,123141,000437,063222,000740,063261,020700
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 7045  044260  060662  060701  062234          .WORD   060662,060701,062234,114673,120400,061620,112605,070216
 7046  044266  114673  120400  061620
 7047  044274  112605  070216
 7048  044300  047634  116673  043635          .WORD   047634,116673,043635,113521,000401,064334,043635,113524
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 7050  044314  043635  113524
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 7053  044334  114673  054220
 7054  044340  016414  054220  054220          .WORD   016414,054220,054220,136500,136520,123160,000740,063260
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 7056  044354  000740  063260
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 7059  044374  123141  063161
 7060  044400  123160  000401  063260          .WORD   123160,000401,063250,111156,063160,063260,063161,111166
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 7062  044414  063161  111166
 7063  044420  063160  111166  070076          .WORD   063160,111166,070076,002461,000407,070016,076601,000401
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 7065  044434  076601  000401
 7066  044440  076660  123160  000436          .WORD   076660,123160,000436,076660,000440,063260,000420,063300
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 7068  044454  000420  063300
 7069  044460  000403  060675  070216          .WORD   000403,060675,070216,076700,114673,047634,116673,043635
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 7077  044534  054220  136500
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 7085  044606  063160  076660  123160
 7086  044614  110662  123160
 7087  044620  000401  076660  000436          .WORD   000401,076660,000436,076660,000403,060675,070217,076675
 7088  044626  076660  000403  060675
 7089  044634  070217  076675
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 7093  044660  070077  123560  113305          .WORD   070077,123560,113305,002533,110706,002603,000412,070017
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 7123  045120  061620  061223  057234          .WORD   061620,061223,057234,057220,000560,057222,060662,061620
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 7125  045134  060662  061620
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 7127  045146  063223  055226  064214
 7128  045154  060605  061620
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 7131  045174  014420  074661
 7132  045200  061620  077303  055224          .WORD   061620,077303,055224,055225,057220,063120,063120,063120
 7133  045206  055225  057220  063120
 7134  045214  063120  063120
 7135  045220  063120  000700  060660          .WORD   063120,000700,060660,060703,061227,003360,120440,060660
 7136  045226  060703  061227  003360
 7137  045234  120440  060660
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 7140  045254  000700  114705
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 7143  045274  061620  063303
 7144  045300  060605  117552  000402          .WORD   060605,117552,000402,070017,056222,062203,056226,056227
 7145  045306  070017  056222  062203
 7146  045314  056226  056227
 7147  045320  057220  123221  054661          .WORD   057220,123221,054661,061311,055230,000403,070017,054406
 7148  045326  061311  055230  000403
 7149  045334  070017  054406
 7150  045340  061224  057220  061105          .WORD   061224,057220,061105,115135,114540,043220,000404,062400
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 7155  045374  061231  000773
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 7178  045566  120400  116247  116673
 7179  045574  110504  106716
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 7209  046034  001067  114767
 7210  046040  001107  114771  001127          .WORD   001107,114771,001127,114773,001147,114775,001167,114777
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 7212  046054  001167  114777
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 7217  046060                          BOPN32:
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 7223  046114  004002  016403
 7224  046120  002403  000400  061220          .WORD   002403,000400,061220,061222,114400,000560,063236,004400
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 7226  046134  063236  004400
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 7228  046146  102451  020660  102054
 7229  046154  102606  004420
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 7231  046166  107625  107001  004420
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 7235  046214  002012  057635
 7236  046220  103713  140620  000403          .WORD   103713,140620,000403,070017,056406,101070,070077,100477
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 7238  046234  070077  100477
 7239  046240  056407  101073  100466          .WORD   056407,101073,100466,043220,000404,076400,100466,016505
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 7243  046266  062735  100437  016462
 7244  046274  056222  022203
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 7247  046314  055230  056411
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 7253  046354  004600  070217
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7287  046640  076604  076605  060605          .WORD   076604,076605,060605,103676,002402,100437,002774,100437
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7307  047014  010000  056407
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7317  047100  062735  100445  016444          .WORD   062735,100445,016444,016172,014401,062230,042224,056406
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7319  047114  042224  056406
7320  047120  105034  056225  055230          .WORD   105034,056225,055230,000402,070016,120600,106025,120620
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7327  047166  104423  016460  002132
7328  047174  056230  000400
7329  047200  060220  002172  062230          .WORD   060220,002172,062230,100445,016556,104445,016454,104413
7330  047206  100445  016556  104445
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7331  047214  016454  104413
7332  047220  016132  054220  056230          .WORD   016132,054220,056230,042224,056406,105112,056225,055230
7333  047226  042224  056406  105112
7334  047234  056225  055230
7335  047240  056411  105074  042411          .WORD   056411,105074,042411,105501,070216,000420,076735,054220
7336  047246  105501  070216  000420
7337  047254  076735  054220
7338  047260  104503  070076  016522          .WORD   104503,070076,016522,120600,106103,120620,106213,036400
7339  047266  120600  106103  120620
7340  047274  106213  036400
7341  047300  036420  100445  042225          .WORD   036420,100445,042225,056407,105116,104467,041230,003004
7342  047306  056407  105116  104467
7343  047314  041230  003004
7344  047320  056404  104470  016556          .WORD   056404,104470,016556,043221,000411,070016,043622,107152
7345  047326  043221  000411  070016
7346  047334  043622  107152
7347  047340  002372  063122  063122          .WORD   002372,063122,063122,063522,062602,060522,062230,060601
7348  047346  063522  062602  060522
7349  047354  062230  060601
7350  047360  060220  002132  062230          .WORD   060220,002132,062230,000402,060220,002172,062230,070076
7351  047366  000402  060220  002172
7352  047374  062230  070076
7353  047400  002565  100445  002132          .WORD   002565,100445,002132,060601,062230,100445,054220,054220
7354  047406  060601  062230  100445
7355  047414  054220  054220
7356  047420  057221  000411  070016          .WORD   057221,000411,070016,043222,104530,007200,070216,042727
7357  047426  043222  104530  007200
7358  047434  070216  042727
7359  047440  064214  056700  000411          .WORD   064214,056700,000411,070016,043225,004002,010000,056407
7360  047446  070016  043225  004002
7361  047454  010000  056407
7362  047460  043224  000410  062404          .WORD   043224,000410,062404,070204,016400,076617,076614,054220
7363  047466  070204  016400  076617
7364  047474  076614  054220
7365  047500  076605  002401  100445          .WORD   076605,002401,100445,063224,000500,060664,061231,000773
7366  047506  063224  000500  060664
7367  047514  061231  000773
7368  047520  063224  002172  000404          .WORD   063224,002172,000404,062230,104634,002172,000777,063224
7369  047526  062230  104634  002172
7370  047534  000777  063224
7371  047540  000401  062230  043635          .WORD   000401,062230,043635,100445,007200,070216,042727,064214
7372  047546  103445  007200  070216
7373  047554  042727  064214
7374  047560  056700  004002  010000          .WORD   056700,004002,010000,056407,043220,000410,062400,070200
7375  047566  056407  043220  000410
7376  047574  062400  070200
7377  047600  016400  076617  076614          .WORD   016400,076617,076614,054220,016400,062604,100445,043620
7378  047606  054220  016400  062604
7379  047614  100445  043620
7380  047620  106662  114672  002740          .WORD   106662,114672,002740,004001,002701,004600,070017,002700
7381  047626  004001  002701  004600
7382  047634  070017  002700
7383  047640  004001  002701  000400          .WORD   004001,002701,000400,002372,062230,000421,062234,114672
7384  047646  002372  062230  000421
7385  047654  062234  114672
7386  047660  123561  107262  061620          .WORD   123561,107262,061620,106334,106710,060521,113424,114672
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 7387  047666  106334  106710  060521
 7388  047674  113424  114672
 7389  047700  004002  010000  056407          .WORD   004002,010000,056407,043220,000410,062400,070200,016405
 7390  047706  043220  000410  062400
 7391  047714  070200  016405
 7392  047720  076617  016400  016400          .WORD   076617,016400,016400,023260,000410,060660,061620,061620
 7393  047726  023260  000410  060660
 7394  047734  061620  061620
 7395  047740  061620  076620  002410          .WORD   061620,076620,002410,114672,120400,061620,106770,070216
 7396  047746  114672  120400  061620
 7397  047754  106770  070216
 7398  047760  047234  043635  117672          .WORD   047234,043635,117672,002172,000404,062230,007200,042727
 7399  047766  002172  000404  062230
 7400  047774  007200  042727
 7401  050000  064214  056700  004002          .WORD   064214,056700,004002,010000,056407,043220,000410,062400
 7402  050006  010000  056407  043220
 7403  050014  000410  062400
 7404  050020  070200  016400  076617          .WORD   070200,016400,076617,076614,016400,016400,016772,114672
 7405  050026  076614  016400  016400
 7406  050034  016772  114672
 7407  050040  047234  043635  117672          .WORD   047234,043635,117672,000776,023301,063661,062234,060461
 7408  050046  000776  023301  063661
 7409  050054  062234  060461
 7410  050060  062234  004600  042727          .WORD   062234,004600,042727,064214,043221,076701,014410,004002
 7411  050066  064214  043221  076701
 7412  050074  014410  004002
 7413  050100  010000  056407  043220          .WORD   010000,056407,043220,062400,070200,016404,076617,076614
 7414  050106  062400  070200  016404
 7415  050114  076617  076614
 7416  050120  016400  016400  016772          .WORD   016400,016400,016772,114672,123141,000437,063222,000740
 7417  050126  114672  123141  000437
 7418  050134  063222  000740
 7419  050140  063261  020700  060662          .WORD   063261,020700,060662,060701,062234,114672,120400,061620
 7420  050146  060701  062234  114672
 7421  050154  120400  061620
 7422  050160  112534  070216  047634          .WORD   112534,070216,047634,116672,043635,113453,000401,064334
 7423  050166  116672  043635  113453
 7424  050174  000401  064334
 7425  050200  043635  113456  114672          .WORD   043635,113456,114672,060535,113461,110446,060535,113461
 7426  050206  060535  113461  110446
 7427  050214  060535  113461
 7428  050220  114672  054220  016412          .WORD   114672,054220,016412,054220,054220,136500,136520,123160
 7429  050226  054220  054220  136500
 7430  050234  136520  123160
 7431  050240  000700  063260  063120          .WORD   000700,063260,063120,063140,063140,063120,063120,076460
 7432  050246  063140  063140  063120
 7433  050254  063120  076460
 7434  050260  123141  063161  123160          .WORD   123141,063161,123160,000401,063260,111110,063160,063260
 7435  050266  000401  063260  111110
 7436  050274  063160  063260
 7437  050300  063161  111120  063160          .WORD   063161,111120,063160,111120,070076,002456,000407,070016
 7438  050306  111120  070076  002456
 7439  050314  000407  070016
 7440  050320  076601  000401  076660          .WORD   076601,000401,076660,123160,000436,076660,003020,000403
 7441  050326  123160  000436  076660
 7442  050334  003020  000403
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 7443  050340  060675  070216  076700          .WORD   060675,070216,076700,114672,047634,116672,043635,113545
 7444  050346  114672  047634  116672
 7445  050354  043635  113545
 7446  050360  000401  064334  043635          .WORD   000401,064334,043635,113550,114672,060535,113553,110540
 7447  050366  113550  114672  060535
 7448  050374  113553  110540
 7449  050400  060535  113553  114672          .WORD   060535,113553,114672,054220,016477,054220,136500,136520
 7450  050406  054220  016477  054220
 7451  050414  136500  136520
 7452  050420  123160  000740  063260          .WORD   123160,000740,063260,063120,063140,063140,063120,076520
 7453  050426  063120  063140  063140
 7454  050434  063120  076520
 7455  050440  016500  016421  123140          .WORD   016500,016421,123140,000402,076740,111620,111206,123160
 7456  050446  000402  076740  111620
 7457  050454  111206  123160
 7458  050460  000401  063260  063160          .WORD   000401,063260,063160,076660,123160,110611,123160,000401
 7459  050466  076660  123160  110611
 7460  050474  123160  000401
 7461  050500  076660  000436  076660          .WORD   076660,000436,076660,000403,060675,070217,076675,114672
 7462  050506  000403  060675  070217
 7463  050514  076675  114672
 7464  050520  123160  000401  063260          .WORD   123160,000401,063260,063160,111627,076660,110611,070077
 7465  050526  063160  111627  076660
 7466  050534  110611  070077
 7467  050540  123560  113234  002533          .WORD   123560,113234,002533,110635,002603,000412,070017,110611
 7468  050546  110635  002603  000412
 7469  050554  070017  110611
 7470  050560  060220  060220  060220          .WORD   060220,060220,060220,060220,060220,060220,060220,060220
 7471  050566  060220  060220  060220
 7472  050574  060220  060220
 7473  050600  060220  060220  060220          .WORD   060220,060220,060220,060220,060220,060220,060220,060220
 7474  050606  060220  060220  060220
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 7476  050620  060220  060220  060220          .WORD   060220,060220,060220,060220,060220,060220,060220,060220
 7477  050626  060220  060220  060220
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 7479  050640  060220  060220  060220          .WORD   060220,060220,060220,060220,060220,060220,060220,060220
 7480  050646  060220  060220  060220
 7481  050654  060220  060220
 7482  050660  060220  060220  060220          .WORD   060220,060220,060220,060220,060220,060220,060220,060220
 7483  050666  060220  060220  060220
 7484  050674  060220  060220
 7485  050700  060220  060220  060220          .WORD   060220,060220,060220,060220,060220,060220,060220,060220
 7486  050706  060220  060220  060220
 7487  050714  060220  060220
 7488  050720  060220  060220  060220          .WORD   060220,060220,060220,060220,060220,060220,060220,060220
 7489  050726  060220  060220  060220
 7490  050734  060220  060220
 7491  050740  060220  060220  060220          .WORD   060220,060220,060220,060220,060220,060220,060220,060220
 7492  050746  060220  060220  060220
 7493  050754  060220  060220
 7494  050760  060220  060220  060220          .WORD   060220,060220,060220,060220,060220,060220,060220,060220
 7495  050766  060220  060220  060220
 7496  050774  060220  060220
 7497  051000  060220  060220  060220          .WORD   060220,060220,060220,060220,060220,060220,060220,060220
 7498  051006  060220  060220  060220
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 7502  051034  060220  060220
 7503  051040  060220  060220  060220          .WORD   060220,060220,060220,060220,060220,060220,060220,060220
 7504  051046  060220  060220  060220
 7505  051054  060220  060220
 7506  051060  174610  004002  010000          .WORD   174610,004002,010000,043620,115606,076560,014410,043225
 7507  051066  043620  115606  076560
 7508  051074  014410  043225
 7509  051100  062405  070205  057625          .WORD   062405,070205,057625,116167,057637,061620,061620,061620
 7510  051106  116167  057637  061620
 7511  051114  061620  061620
 7512  051120  061620  061223  057234          .WORD   061620,061223,057234,057220,000560,057222,060662,061620
 7513  051126  057220  000560  057222
 7514  051134  060662  061620
 7515  051140  061620  061620  061620          .WORD   061620,061620,061620,063223,055226,064214,060605,061620
 7516  051146  063223  055226  064214
 7517  051154  060605  061620
 7518  051160  116500  000600  070017          .WORD   116500,000600,070017,043221,000500,076701,014420,074661
 7519  051166  043221  000500  076701
 7520  051174  014420  074661
 7521  051200  061620  077303  055224          .WORD   061620,077303,055224,055225,057220,063120,063120,063120
 7522  051206  055225  057220  063120
 7523  051214  063120  063120
 7524  051220  063120  000700  060660          .WORD   063120,000700,060660,060703,061227,003360,120440,060660
 7525  051226  060703  061227  003360
 7526  051234  120440  060660
 7527  051240  063305  000600  060705          .WORD   063305,000600,060705,061222,060525,117602,000677,114704
 7528  051246  061222  060525  117602
 7529  051254  000677  114704
 7530  051260  070217  043221  000500          .WORD   070217,043221,000500,062701,000420,060661,061620,063303
 7531  051266  062701  000420  060661
 7532  051274  061620  063303
 7533  051300  060605  117552  000402          .WORD   060605,117552,000402,070017,056222,062203,056226,056227
 7534  051306  070017  056222  062203
 7535  051314  056226  056227
 7536  051320  057220  123221  054661          .WORD   057220,123221,054661,061311,055230,000403,070017,054406
 7537  051326  061311  055230  000403
 7538  051334  070017  054406
 7539  051340  061224  057220  061105          .WORD   061224,057220,061105,115135,114540,043220,000404,062400
 7540  051346  115135  114540  043220
 7541  051354  000404  062400
 7542  051360  120600  116140  120620          .WORD   120600,116140,120620,116145,114454,000400,061231,000773
 7543  051366  116145  114454  000400
 7544  051374  061231  000773
 7545  051400  061226  114454  060601          .WORD   061226,114454,060601,117112,000403,070017,056406,043220
 7546  051406  117112  000403  070017
 7547  051414  056406  043220
 7548  051420  076500  115163  114512          .WORD   076500,115163,114512,043221,000404,076401,114512,054620
 7549  051426  043221  000404  076401
 7550  051434  114512  054620
 7551  051440  061620  061620  061620          .WORD   061620,061620,061620,061620,061223,055224,055225,055226
 7552  051446  061620  061223  055224
 7553  051454  055225  055226
 7554  051460  055227  114465  123620          .WORD   055227,114465,123620,000700,061311,114476,123400,061620
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 7555  051466  000700  061311  114476
 7556  051474  123400  061620
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 7558  051506  000600  061300  060520
 7559  051514  117621  000625
 7560  051520  114704  000600  061231          .WORD   114704,000600,061231,000663,114704,123400,061620,117251
 7561  051526  000663  114704  123400
 7562  051534  061620  117251
 7563  051540  123077  000407  063277          .WORD   123077,000407,063277,063137,063137,063137,073537,062231
 7564  051546  063137  063137  063137
 7565  051554  073537  062231
 7566  051560  004600  060417  063236          .WORD   004600,060417,063236,120400,116247,116672,110436,106657
 7567  051566  120400  116247  116672
 7568  051574  110436  106657
 7569  051600  104700  060600  117654          .WORD   104700,060600,117654,114606,060520,117657,100425,000600
 7570  051606  114606  060520  117657
 7571  051614  100425  000600
 7572  051620  061231  000663  114704          .WORD   061231,000663,114704,123400,061620,117267,114630,060600
 7573  051626  123400  061620  117267
 7574  051634  114630  060600
 7575  051640  103425  114606  123000          .WORD   103425,114606,123000,000500,061260,000401,114704,123440
 7576  051646  000500  061260  000401
 7577  051654  114704  123440
 7578  051660  103425  000500  061262          .WORD   103425,000500,061262,000401,063230,100425,000000,000000
 7579  051666  000401  063230  100425
 7580  051674  000000  000000
 7581  051700  000000  000000  000000          .WORD   000000,000000,000000,000000,000000,000000,000000,000000
 7582  051706  000000  000000  000000
 7583  051714  000000  000000
 7584  051720  000000  000000  000000          .WORD   000000,000000,000000,000000,000000,000000,000000,000000
 7585  051726  000000  000000  000000
 7586  051734  000000  000000
 7587  051740  000000  000000  000000          .WORD   000000,000000,000000,000000,000000,000000,000000,000000
 7588  051746  000000  000000  000000
 7589  051754  000000  000000
 7590  051760  000000  000000  000000          .WORD   000000,000000,000000,000000,000000,000000,000000,000000
 7591  051766  000000  000000  000000
 7592  051774  000000  000000
 7593  052000  000000  000000  000000          .WORD   000000,000000,000000,000000,000000,000000,000000,000000
 7594  052006  000000  000000  000000
 7595  052014  000000  000000
 7596  052020  001007  114761  001027          .WORD   001007,114761,001027,114763,001047,114765,001067,114767
 7597  052026  114763  001047  114765
 7598  052034  001067  114767
 7599  052040  001107  114771  001127          .WORD   001107,114771,001127,114773,001147,114775,001167,114777
 7600  052046  114773  001147  114775
 7601  052054  001167  114777
 7602  052060                        ENDA:
 7603  052060  000100                PATCH:  .BLKW   100
 7604  052260     201                TBUF:   .BYTE   201     ;SET FIRST CHARACTER TO SOH
 7605  052261  000377                        .BLKB   255.    ;PPSEUDO-RANDOM DATA
 7606  052660  000200                RBUF:   .BLKW   128.
 7607
 7608          000001                        .END
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ADDR    030010          5546*  5562*  5567#
ADINH   030016          5552*  5553   5557   5564*  5570#
ADINL   030014          5550*  5555   5563*  5569#
BADDR   002532          1559#  3126   3128   3137   3212   3217   3347   3462   3590   3593   3624   3655   3695
                        5507   5513   5562   6032
BEGIN   001542          1254   1260   1387#
BIT0  = 000001          1184#
BIT00 = 000001          1174#  1184
BIT01 = 000002          1173#  1183
BIT02 = 000004          1172#  1182
BIT03 = 000010          1171#  1181
BIT04 = 000020          1170#  1180
BIT05 = 000040          1169#  1179
BIT06 = 000100          1168#  1178
BIT07 = 000200          1167#  1177
BIT08 = 000400          1166#  1176   4097
BIT09 = 001000          1165#  1175   4105   4188
BIT1  = 000002          1183#
BIT10 = 002000          1164#  4149
BIT11 = 004000          1163#  4112
BIT12 = 010000          1162#
BIT13 = 020000          1161#  4156
BIT14 = 040000          1160#  4083
BIT15 = 100000          1159#  4000
BIT2  = 000004          1182#
BIT3  = 000010          1181#
BIT4  = 000020          1180#
BIT5  = 000040          1179#
BIT6  = 000100          1178#
BIT7  = 000200          1177#
BIT8  = 000400          1176#
BIT9  = 001000          1175#
BOPEND  046060          7215#
BOPN32  046060          5584   7217#
BOPW32  042060          5587   6827#
BPTVEC= 000014          1191#
BUFADR  002522          1554#  1835*  1846*  1969*  1974*  2045*  2067*  2073*  2138*  2191*  2261*  2329*  2408*
                        2438*  2505*  2607*  2643*  2730*  2737*  2840*  2848*  2907*  2911*  2985*  2989*  3054*
                        3058*  3137*  3260*  3267*  3371*  3483   3485*  3491*  3624*  3909*  5832   6044*
BUFCNT  002526          1556#  1741*  1742   1783*  1784   1837*  1842*  1847*  1970*  1975*  2047*  2048*  2071*
                        2072*  2140*  2141*  2193*  2194*  2263*  2264*  2330*  2332*  2409*  2411*  2502*  2503*
                        2604*  2605*  2727*  2728*  2738*  2739*  2837*  2838*  2845*  2846*  2895*  2912*  2977*
                        3046*  3138*  3243*  3244*  3259*  3266*  3366*  3367*  3373*  3374*  3481*  3482*  3492*
                        3493*  3618*  3915*  3919*  3937*  3941*  5834   6042*  6043*
BUFEA   002524          1555#  1836*  1968*  2046*  2139*  2192*  2262*  2333*  2412*  2504*  2606*  2726*  2839*
                        2847*  2896*  2976*  3045*  3136*  3242*  3345*  3372*  3460*  3484   3486*  3490*  3617
                        3623*  5833   6001*  6041*
CCHI    027662          5523*  5534#  5553
CCLO    027664          5524*  5535#  5555
CCNT    030006          5544   5550   5566#
CCPEND  042060          6823#
CCPFRM  036060          5581   6438#
CCTST   002534          1560#  3109   3114   3209   3213   3343   3458   3587   5530*  5532*
CHAR    002516          1551#
CHRADR  002320          1495#  4962*  4963   5179*  5180
CKSWR = 104407          4077   4145   4187   4904#
```

```
CLINE   002313          1490# 5614* 5758  5770* 5905* 5907  5910* 5913*
CLKALL  031226          2324  2403  2498  2600  5789#
CLKDAT  002316          1494# 2772  3233  3527  5345* 5348* 5633  5812  5978
CNTBIT  002325          1498#
COMIN   031614          5895#
CONBIT  002326          1499#
CONFIG  024356          4936# 4951  5107*
CR    = 000015          1099# 4707  4717
CRC32F  002314          1493# 2774  3235  3529  3672  5337* 5585  5980
CRLF  = 000200          1100# 1442  4661  4717
CSR0    002342          1508# 5862* 6408  6411  6424  6428
CSR2    002344          1509# 5863* 6408  6411  6424  6428  6431
CSR4    002346          1510# 5864* 6408  6411  6424  6428  6431
CSR6    002350          1511# 5865* 6408  6411  6424  6428  6431
CUNIT   002456          1535# 4003  4992* 5028  5367* 5635* 5637  5642* 5654  5657* 5658  6402  6404
                        6406  6408  6411  6415  6418  6421  6424  6428  6431
CURBUF  002500          1544# 3347* 3427* 3462* 3552* 3590* 3591* 3683  3735* 5964  5967  6015  6044
                        6421
CURDAT  002324          1497#
CUREA   002476          1543# 3346* 3429* 3461* 3554* 3592* 3737* 5965  6014  6037  6421
CURLIN  002454          1534# 1695  1744  1786  1822  1870  1871  1911  1912  2004  2005  2057  2104
                        2105  2202  2272  2346  2363  2364  2425  2450  2451  2530  2547  2548  2632
                        2657  2658  2754  5615* 5748  5757  5769* 5789  5797* 5800* 5810  5831  5883
                        5906* 5914* 6406  6408  6411  6421  6431
CURLUR  002322          1496#
CURTAB  024360          1518* 4937# 4943* 5004* 5030  5200  5211* 5318  5322* 5326* 5360  5630*
DDISP = 177570          1106# 1293  1413
DF1     036042          1329  1331  1333  1335  1337  1339  1341  1343  1345  1347  1349  1351  1353
                        1355  1357  1359  1361  1363  1365  1367  1369  1371  1373  1375  1377  1379
                        1381  1383  6435#
DH1     034446          1329  6297#
DH10    035164          1375  1377  6357#
DH11    035260          1365  1379  6367#
DH12    035365          1381  1383  6379#
DH13    035454          1373  6389#
DH2     034507          1331  1333  6303#
DH3     034553          1335  6310#
DH4     034612          1337  1339  1349  1351  1355  6316#
DH5     034707          1341  1343  1345  1347  1353  1357  1359  1361  1363  1367  1369  1371  6327#
DH6     035014          6339#
DH7     035100          6348#
DISPLA  001142          1293# 1413* 1421* 4126* 4148*
DISPRE  000174          1257# 1421
DSWR  = 177570          1105# 1292  1412
DT1     035562          1329  6402#
DT10    035726          1375  1377  6421#
DT11    035750          1365  1379  6424#
DT12    035774          1381  1383  6428#
DT13    036016          1373  6431#
DT2     035574          1331  1333  6404#
DT3     035610          1335  6406#
DT4     035622          1337  1339  1349  1351  1355  6408#
DT5     035644          1341  1343  1345  1347  1353  1357  1359  1361  1363  1367  1369  1371  6411#
DT6     035670          6415#
DT7     035706          6418#
EABITS  030012          5548* 5561* 5568#
```

```
EMTVEC= 000030  1194#  1398*  1399*
EM01    033050  1329   6151#
EM02    033101  1331   6156#
EM03    033137  1333   6162#
EM04    033164  1335   6166#
EM05    033211  1337   6170#
EM06    033240  1339   6174#
EM07    033270  1341   6178#
EM10    033324  1343   6183#
EM11    033347  1345   6187#
EM12    033405  1347   6193#
EM13    033444  1349   6199#
EM14    033503  1351   6205#
EM15    033542  1353   6211#
EM16    033602  1355   6217#
EM17    033641  1357   6223#
EM20    033702  1359   6229#
EM21    033742  1361   6235#
EM22    034001  1363   6241#
EM23    034021  1365   6244#
EM24    034054  1367   6249#
EM25    034106  1369   6254#
EM26    034143  1371   6259#
EM27    034170  1373   6263#
EM30    034222  1375   6268#
EM31    034275  1377   6276#
EM32    034350  1379   6284#
EM33    034373  1381   6288#
EM34    034420  1383   6292#
ENDA    052060  7602#
ERNUM   002452  1533#  1577*  1594*  1619*  1623*  1627*  1632*  1659*  1663*  1686*  1691*  1701*  1731*
                1736*  1740*  1773*  1778*  1782*  1821*  1826*  1829*  1838*  1841*  1848*  1851*  1859*
                1863*  1868*  1873*  1879*  1887*  1895*  1900*  1904*  1909*  1914*  1920*  1956*  1971*
                1976*  1981*  1986*  1990*  1993*  2002*  2036*  2049*  2053*  2056*  2062*  2066*  2070*
                2076*  2081*  2093*  2102*  2133*  2142*  2146*  2149*  2154*  2184*  2195*  2199*  2207*
                2211*  2223*  2254*  2265*  2269*  2277*  2281*  2318*  2326*  2342*  2345*  2354*  2355*
                2359*  2362*  2366*  2397*  2405*  2421*  2424*  2433*  2442*  2446*  2449*  2453*  2458*
                2492*  2501*  2513*  2524*  2529*  2536*  2537*  2541*  2545*  2550*  2555*  2557*  2560*
                2594*  2603*  2615*  2626*  2631*  2638*  2647*  2651*  2655*  2660*  2665*  2679*  2682*
                2716*  2725*  2736*  2749*  2753*  2757*  2765*  2789*  2795*  2826*  2835*  2843*  2851*
                2856*  2859*  2897*  2906*  2910*  2915*  2919*  2924*  2929*  2975*  2984*  2988*  2992*
                2996*  3001*  3005*  3044*  3053*  3057*  3061*  3066*  3070*  3074*  3112*  3135*  3141*
                3145*  3158*  3166*  3171*  3183*  3245*  3256*  3263*  3270*  3276*  3280*  3291*  3296*
                3304*  3348*  3364*  3370*  3377*  3381*  3390*  3395*  3405*  3413*  3418*  3463*  3479*
                3489*  3496*  3500*  3509*  3514*  3521*  3538*  3543*  3596*  3609*  3622*  3627*  3639*
                3644*  3649*  3658*  3664*  3669*  3678*  3687*  3693*  3731*  3779*  3790*  3802*  3808*
                3815*  3824*  3833*  3856*  3896*  3907*  3914*  3918*  3922*  3934*  3940*  3944*  3953*
                3958*  3978*  6402   6404   6406   6408   6411   6415   6418   6421   6424   6428   6431
ERRVEC= 000004  1187#  1410   1411*  1422*  4088   4089*  4091*  4094*  5395   5396   5400*  5405*  5408*
                5434*  5439*  5443   5460*  5470*  5471*
FRD     031362  5827   5831#
FSWSW   002310  1487#
GETCOR  027452  1449   5485#
GETCSR  031470  1750   1792   1930   2014   2114   2164   2234   2298   2376   2470   2572   2694   2799
                2868   2948   3017   3086   3185   3320   3751   3847   3969   5862#
GETKMC  026506  1519   4011   5318#  5631
```

```
GETLIN  031650          1712    1755    1797    1936    2008    2107    2159    2229    2293    2336    2372    2415    2466
                        2509    2518    2566    2611    2620    2688    2803    2863    2940    3010    3079    3178    3314
                        3740    5616    5765    5794    5906#
GETLNO  031644          5905#   5909
GETPHA  027666          5543#
GNS   = ****** U        1256    1441    1454    1467    4896    4897    4898    4899    4900    4902    4904    4905    4906
                        4907    4968    4949    4957    5007    5014    5023    5036    5041    5047    5055    5065    5071
                        5083    5088    5104    5144    5187    5606    5645    5652    5664    5669
GTSWR = 104406          1436    4902#
HADDR   002336          1506#   5509*   5998
HOLDB   031202          5758*   5770    5772#
HT    = 000011          1097#   4659    4717
INPDUN  031772          1746    1788    2060    2208    2278    2351    2430    2534    2636    5751    5814    5835    5887
                        5942#
INTALL  031120          2322    2401    2496    2598    2720    5757#
INTKMC  030664          1621    1661    1688    1733    1775    1824    1958    2038    2134    2185    2255    2320    2399
                        2494    2596    2718    2828    2899    2978    3047    3129    3248    3358    3473    3599    3781
                        3804    3820    3897    5700#
INTLIN  031064          5748#   5763    5781
INTLNE  031204          1827    1960    2040    2136    2187    2257    2830    2901    2980    3049    3131    3250    3360
                        3475    3601    3910    5778#
INTPRM  030616          1561    5681#
INTREC  032456          3365    6052#
INTTRM  032510          3480    6066#
IOT   = 000004          1532#   5684
IOTVEC= 000020          1192#   1396*   1397*
KIPAR0= 172340          1225#   5376    5426    6023
KIPAR1= 172342          1226#
KIPAR2= 172344          1227#
KIPAR3= 172346          1228#
KIPAR4= 172350          1229#
KIPAR5= 172352          1230#
KIPAR6= 172354          1231#
KIPAR7= 172356          1232#   6031*
KIPDR0= 172300          1214#   6005
KIPDR1= 172302          1215#
KIPDR2= 172304          1216#
KIPDR3= 172306          1217#
KIPDR4= 172310          1218#
KIPDR5= 172312          1219#
KIPDR6= 172314          1220#
KIPDR7= 172316          1221#
KMCE01  026246          5221#
KMCE02  026260          5227#
KMCE03  026272          5233#
KMCE04  026304          5239#
KMCE05  026316          5245#
KMCE06  026330          5251#
KMCE07  026342          5257#
KMCE08  026354          5263#
KMCE09  026366          5269#
KMCE10  026400          5275#
KMCE11  026412          5281#
KMCE12  026424          5287#
KMCE13  026436          5293#
KMCE14  026450          5299#
```

KMCE15	026462	5305#							
KMCE16	026474	5311#							
KMCNT	024354	4935#	4978*	4982*					
KMCP01	026252	5223#							
KMCP02	026264	5229#							
KMCP03	026276	5235#							
KMCP04	026310	5241#							
KMCP05	026322	5247#							
KMCP06	026334	5253#							
KMCP07	026346	5259#							
KMCP08	026360	5265#							
KMCP09	026372	5271#							
KMCP10	026404	5277#							
KMCP11	026416	5283#							
KMCP12	026430	5289#							
KMCP13	026442	5295#							
KMCP14	026454	5301#							
KMCP15	026466	5307#							
KMCP16	026500	5313#							
KMCR01	026244	5220#							
KMCR02	026256	5226#							
KMCR03	026270	5232#							
KMCR04	026302	5238#							
KMCR05	026314	5244#							
KMCR06	026326	5250#							
KMCR07	026340	5256#							
KMCR08	026352	5262#							
KMCR09	026364	5268#							
KMCR10	026376	5274#							
KMCR11	026410	5280#							
KMCR12	026422	5286#							
KMCR13	026434	5292#							
KMCR14	026446	5298#							
KMCR15	026460	5304#							
KMCR16	026472	5310#							
KMCS01	026254	5224#							
KMCS02	026266	5230#							
KMCS03	026300	5236#							
KMCS04	026312	5242#							
KMCS05	026324	5248#							
KMCS06	026336	5254#							
KMCS07	026350	5260#							
KMCS08	026362	5266#							
KMCS09	026374	5272#							
KMCS10	026406	5278#							
KMCS11	026420	5284#							
KMCS12	026432	5290#							
KMCS13	026444	5296#							
KMCS14	026456	5302#							
KMCS15	026470	5308#							
KMCS16	026502	5314#	5320						
KMCTAB	026244	1518	4938	4942	4979	5003	5218#	5322	5361	5630
KMCTBE	026504	4940	4984	5204	5316#				
KMCV01	026250	5222#							
KMCV02	026262	5228#							
KMCV03	026274	5234#							

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KMCV04  026306          5240#
KMCV05  026320          5246#
KMCV06  026332          5252#
KMCV07  026344          5258#
KMCV08  026356          5264#
KMCV09  026370          5270#
KMCV10  026402          5276#
KMCV11  026414          5282#
KMCV12  026426          5288#
KMCV13  026440          5294#
KMCV14  026452          5300#
KMCV15  026464          5306#
KMCV16  026476          5312#
LDMODE  030020          1562    5575#
LF    = 000012          1098#   4711    4717
LINEB   002312          1489#   5358*   5614    5913
LOOP    002352          1459    1516#   1531
LPARND  030270          1517    5625#
LRCBUF  033026          2989    6142#
LRSET   031546          2147    5880#
LTEST   002376          1521#   4013
MAPADR  002502          1545#   3696    5964*   6032*   6033*   6052    6066    6120
MAPBFC  032040          5959    5961#
MAPBFR  032030          3352    5958#
MAPBUF  032036          3467    361     5960#
MBOP    020416          4007    4017#
MCCP    020410          4009    4016#
MEMFIL  032542          1967    3127    3241    3595    6059    6068    6082#
MMVEC = 000250          1203#
MODE    002311          1488#   1524    1880    1921    1997    2097    2434    2459    2639    2667    2770    2779    2889
                        2971    3040    3115    3226    3397    3524    3652    3680    3699    4005    5336*   5582    5971
                        6084    6105
MODMSK  002330          1500#   1523*   1526*   2048    2072    2141    2194    2264    2332    2411    2503    2605    2728
                        2739    2838    2846    3244    3367    3374    3482    3493    6043
MODTAB  024424          1462    4948    4950#   4951#   5108    5214
MONIT   002076          1264    1443#   1463    1469    4356    4439    5610
NOTR    024412          4946#   4974    4994    4996
NXMADR  002520          1552#
PARCHK  031426          5844#
PATCH   052060          7603#
PERBUF  033036          3058    6145#
PIRQ  = 177772          1104#
PIRQVE= 000240          1198#
POPPOP= 022626          1087#   1597
POPSP = 005726          1088#   3817
POP2SP= 022626          1086#   3816    3843    3855    3962    3977
PRIIN   002304          1485#   3841
PRIOUT  002306          1486#
PR0   = 000000          1121#
PR1   = 000040          1122#
PR2   = 000100          1123#
PR3   = 000140          1124#
PR4   = 000200          1125#
PR5   = 000240          1126#
PR6   = 000300          1127#
PR7   = 000340          1128#   3787    3789    3793    3803    3810    3813    3819    3835    3837    3904    3906    3908
```

```
                        3947    3952    3959
PS      = 177776        1101#   1102    3793*   3803*   3810*   3813*   3819*   3834*   3835    3837*   3908*   3947*   3952*
                        3959*
PSW     = 177776        1102#   1444*   1528*   1563*
PT        024452        4944    4959    4960#
PWRVEC= 000024          1193#
RBONLY  031522          2921    2998    3067    5869#
RBUF    052660          1785    1835    1882    1884    1969    2045    2067    2261    2408    2607    2730    2769    2907
                        2925    2985    3002    3054    3071    3485    3523    3909    6070    6072    6118    7606#
RBUFSZ  002530          1557#   3232*   3237*   3257    3264
RDCHR = 104410          4515    4905#   4961    5175
RDDEC = 104413          4908#   4990
RDLIN = 104411          4275    4589    4906#   5113
RDOCT = 104412          1456    4907#   5090    5149    5163
RECBUF  002506          1547#   6415
RECEA   002504          1546#
REQGO   031026          5725    5727    5729    5731    5733#
REQNC   031000          2054    2200    2422    2629    5728#   5808    5881
REQNI   031020          1692    5732#   5761    5779
REQNR   030770          1779    5726#   5825
REQNT   030760          1737    5724#   5829
REQNX   031010          2270    2343    2527    5730#
REQOUT  031742          1893    1982    1988    2078    2155    2215    2284    2357    2444    2461    2539    2649    2671
                        2751    2796    2854    2917    2994    3064    3151    3274    3306    3384    3503    3633    3926
                        5872    5932#
RESTRT  002362          1518#   4057
RESVEC= 000010          1188#
RETADR  002512          1549#   3407    3516    5985*
RETBUF  002514          1550#   3396*   3399*   3407*   3415    3516*   3523*   3526*   3531*   3540
RETEA   002510          1548#   3406    3515    5994*
RIN     031344          1839    1843    1972    2050    2068    2266    2413    2609    2618    2685    2732    2841    2908
                        2986    3055    3139    3261    3368    3487    3619    3916    3938    5824#
ROUT    002470          1540#   3231*   3239*   3260    6418
RPT     031416          5826    5830    5836#
RRET    002474          1542#   3223*   3238*   3292
SAVE    002334          1502#
SEL0    002260          1475#   1583*   1584*   1585*   1624    1626*   1629    1631*   1634    1636    1642    1699*   1703
                        3794*   3796    3811*   3827*   3828    5327    5578*   5591*   5594*   5608    5702*   5703*   5704*
                        5724*   5726*   5728*   5730*   5732*   5736    5862    5896    5942*   5944    6402
SEL1    002262          1476#
SEL2    002264          1477#   1582*   1590    1664    1567    1854    1861    1890*   1897    1899*   1902    1984*   1991
                        2080*   2088    2360    2370*   2378*   2447    2457*   2463*   2472*   2543    2556*   2653    2666*
                        2677*   2760    2767    2784    2788*   2857    2922    2999    3068    3159    3162    3170*   3278
                        3288    3298*   3393    3402    3419*   3512    3518    3544*   3641    3727*   3928*   3945*   3948
                        3963*   5701*   5708    5733    5863    5869    5871*   5933
SEL3    002266          1478#   1695*   1744*   1786*   1871    1912    2005    2057*   2105    2202*   2272*   2346*   2364
                        2425*   2451    2530*   2548    2632*   2658    2755    5748*   5810*   5831*   5883*
SEL4    002270          1479#   1697*   1743*   1785*   1885    1926    2059*   2204*   2274*   2348*   2427*   2532*   2634*
                        2782    2926    3003    3072    3168    3282    3293    3414    3539    3650    3684    5589*   5750*
                        5813*   5832*   5864    5885*
SEL5    002272          1480#
SEL6    002274          1481#   1696*   1742*   1784*   1866    1875    1907    1916    2058*   2100    2205*   2225    2275*
                        2349*   2368    2428*   2455    2533*   2553    2635*   2663    2763    2861    2935    3008    3077
                        3409    3534    3645    3659    3675    3689    5590*   5749*   5812*   5833*   5834*   5865    5886*
SEL7    002276          1482#   1877    1918    2000    2203*   2273*   2347*   2426*   2531*   2633*   5811*   5884*
SETLIN  030244          1575    1617    1657    1684    1729    1771    1819    1954    2034    2130    2181    2251    2316
```

```
                        2327    2341    2395    2406    2420    2489    2491    2500    2512    2522    2591    2593    2602
                        2614    2624    2714    2824    2887    2969    3038    3106    3111    3207    3340    3455    3584
                        3777    3893    5614#   5759    5790
SETTAB  024362           1530    4938#   4953
SETUP   002442           1520    1530#
SHBE    002462           1537#   1578*   1620*   1637*   1638*   1643*   1644*   1660*   1687*   1732*   1774*   1823*   1852*
                         1861    1865*   1866    1870*   1875*   1876*   1882*   1884*   1885    1891*   1902    1906*   1907
                         1911*   1916*   1917*   1923*   1925*   1926    1957*   1979*   1987*   1991    1996*   1999*   2000
                         2004*   2037*   2077*   2084*   2096*   2099*   2100    2104*   2132*   2183*   2212*   2224*   2225
                         2253*   2319*   2356*   2363*   2367*   2398*   2443*   2450*   2454*   2493*   2538*   2543    2547*
                         2552*   2561*   2595*   2648*   2653    2657*   2662*   2683*   2717*   2750*   2754*   2755    2758*
                         2762*   2763    2769*   2776*   2778*   2781*   2782    2790*   2827*   2852*   2857    2860*   2861
                         2898*   2920*   2922    2925*   2926    2930*   2934*   2935    2974*   2997*   2999    3002*   3003
                         3006*   3007*   3008    3043*   3062*   3068    3071*   3072    3075*   3076*   3077    3113*   3149*
                         3167*   3172*   3175*   3246*   3277*   3278    3281*   3283    3287*   3288    3292*   3294    3301*
                         3305*   3350*   3392*   3406*   3411    3415*   3416    3422*   3465*   3511*   3515*   3522*   3536
                         3540*   3541    3547*   3598*   3610*   3640*   3646*   3647    3651*   3654*   3655*   3656    3660*
                         3661*   3662    3670*   3674*   3676    3679*   3682*   3683*   3685    3688*   3691    3698*   3703*
                         3705    3712*   3713*   3715*   3718    6121*   6124    6126*   6127    6404    6411    6415    6418
                         6421    6424    6431
SR0     = 177572         1207#   5406    5438*   5449*   5963*   6034*
SR1     = 177574         1208#
SR2     = 177576         1209#
SR3     = 172516         1210#   5435*   5452*
STACK   = 001100         1092#   1394    1443    1516
STCLK   031274           1830    1962    2042    2063    2150    2189    2259    2722    2832    2903    2982    3051    3133
                         3252    3362    3477    3603    3791    3806    3822    3912    5792    5807#
STKLMT= 177774           1103#
STTEST  002536           1529    1561#
SWR     001140           1292#   1392    1412*   1414    1420*   1434    4000    4083    4097    4099    4105    4112    4149
                         4156    4184    4188    4359    4398    4453*
SWREG   000176           1258#   1420    1434    4359    4398    4421
SW0     = 000001         1156#
SW00    = 000001         1146#   1156
SW01    = 000002         1145#   1155
SW02    = 000004         1144#   1154
SW03    = 000010         1143#   1153
SW04    = 000020         1142#   1152
SW05    = 000040         1141#   1151
SW06    = 000100         1140#   1150
SW07    = 000200         1139#   1149
SW08    = 000400         1138#   1148
SW09    = 001000         1137#   1147
SW1     = 000002         1155#
SW10    = 002000         1136#
SW11    = 004000         1135#
SW12    = 010000         1134#
SW13    = 020000         1133#
SW14    = 040000         1132#
SW15    = 100000         1131#
SW2     = 000004         1154#
SW3     = 000010         1153#
SW4     = 000020         1152#
SW5     = 000040         1151#
SW6     = 000100         1150#
SW7     = 000200         1149#
```

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SW8    = 000400          1148#
SW9    = 001000          1147#
SYNTIM  031714           1628    1633    1964    2065    2152    2724    2834    2905    2916    2993    3063    3254    3812
                         5920#
TBITVE= 000014           1189#
TBUF    052260           1743    1965    1974    2073    2138    2191    2329    2505    2737    2778    2848    3371    3396
                         6057    7604#
TERBUF  033002           2438    2643    2894    2938    6131#
TKVEC  = 000060          1196#   4331*   4332*
TPVEC  = 000064          1197#
TRAPVE= 000034           1195#   1400*   1401*
TRTVEC= 000014           1190#
TSTMAP  032724           6120#
TSTNUM  002460           1522*   1536#   1574*   1616*   1656*   1683*   1728*   1770*   1818*   1953*   2033*   2129*   2180*
                         2250*   2315*   2394*   2488*   2590*   2713*   2823*   2886*   2968*   3037*   3105*   3206*   3339*
                         3454*   3583*   3776*   3892*   3997*   6402    6404    6406    6408    6411    6415    6418    6421
                         6424    6428    6431
TSTREC  032716           6118#
TST1    002552           1573#
TST10   004534           1937    1952#
TST11   005072           2009    2032#
TST12   005536           2109    2128#
TST13   005734           2160    2179#
TST14   006226           2230    2249#
TST15   006472           2294    2314#
TST16   007042           2373    2393#
TST17   007460           2467    2487#
TST2    002724           1615#
TST20   010124           2568    2589#
TST21   010652           2690    2712#
TST22   011404           2805    2822#
TST23   011666           2864    2885#
TST24   012260           2942    2967#
TST25   012562           3012    3036#
TST26   013064           3081    3104#
TST27   013534           3180    3205#
TST3    003122           1635    1655#
TST30   014416           3316    3338#
TST31   015166           3438    3453#
TST32   016004           3563    3582#
TST33   017156           3742    3775#
TST34   017630           3844    3891#
TST35   020304           3965    3995#
TST36   020424           4012    4021#
TST4    003214           1666    1682#
TST5    003360           1713    1727#
TST6    003522           1756    1769#
TST7    003664           1798    1817#
TYPDS  = 104405          4004    4046    4244    4900#   5029    5655
TYPE   = 104401          1430    1452    1465    4002    4007    4009    4044    4047    4151    4163    4166    4171    4182
                         4208    4225    4227    4230    4232    4247    4252    4304    4306    4353    4365    4419    4420
                         4423    4434    4444    4455    4474    4522    4528    4533    4537    4542    4543    4545    4548
                         4552    4626    4628    4664    4775    4844    4896#   4947    4955    4963    5005    5012    5021
                         5034    5039    5045    5053    5063    5069    5081    5086    5102    5110    5111    5142    5160
                         5161    5180    5185    5604    5643    5650    5662    5667
TYPFLG  002332           1501#   5641*   5656*   5660
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TYPOC = 104402          4165    4170    4216    4240    4422    4897#   5609
TYPON = 104404          4899#
TYPOS = 104403          4898#   5018
T7BUF   033022          1846    1923    1925    6140#
UNITFG  030556          5626    5636    5647    5673#
UNTDON  020400          4002    4014#
VECIN   002300          1483#   3785    3809*   3825*   3852    3902    3974
VECOUT  002302          1484#   3854    3936*   3976
WAS     002464          1538#   1636*   1637    1642*   1643    1667*   2085*   2947*   3247*   3282*   3283    3293*   3294
                        3349*   3409*   3410*   3411    3414*   3416    3464*   3534*   3535*   3536    3539*   3541    3597*
                        3611*   3641*   3642    3645*   3647    3650*   3656    3659*   3660    3662    3667    3671*   3675*
                        3676    3684*   3685    3689*   3690*   3691    3697*   3704*   3705    3716*   3717*   3718    3780*
                        3839*   3840*   3841    3852*   3854*   3895*   3974*   3976*   5846    6122*   6123*   6124    6404
                        6415    6418    6421    6424    6428
XBITS   002340          1507#   5505*   5995
XIN     031354          1849    1977    2074    2143    2196    2334    2439    2507    2516    2563    2644    2741    2849
                        2913    2990    3059    3142    3268    3375    3494    3625    3920    3942    5828#
XOUT    002466          1539#   3230*   3267    6418    6431
XRET    002472          1541#   3222*   3281
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$BDADR  001122          1284#
$BDDAT  001126          1286#
$BELL   001172          1307#   4151    4200    4365    4562
$CHARC  023600          4666*   4676*   4683    4709*   4714#
$CKSWR  022160          4398#   4904
$CMTAG  001100          1272#   1389    1390    1398    1402    1403    1404
$CM3  = 000000          1302#
$CM4  = 000003          1302#   1303#   1304#   1305#
$CNTLC  023072          4353    4434    4562#
$CNTLG  023104          4419    4564#
$CNTLU  023077          4444    4537    4563#
$CORE   027340          5404    5460#
$CRLF   001177          1309#   4171    4182    4200    4208    4227    4232    4252    4309    4455    4542    4562    4630
                        4665    4717    5110    5161
$CROUT  027370          5460    5467#
$DBLK   024020          4741    4775    4783#
$DOAGN  020524          4040    4049    4055#
$DTBL   024010          4744    4779#
$E    = 000035          1085#   1600    1601#   1640    1641#   1669    1670#   1708    1709#   1751    1752#   1793    1794#
                        1931    1932#   2015    2016#   2115    2116#   2165    2166#   2235    2236#   2299    2300#   2377
                        2378#   2471    2472#   2573    2574#   2695    2696#   2800    2801#   2869    2870#   2949    2950#
                        3018    3019#   3087    3088#   3186    3187#   3321    3322#   3434    3435#   3559    3560#   3752
                        3753#   3848    3849#   3970    3971#
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$ENDCT  020462          1402    4042#
$ENDMG  020533          4044    4059#
$ENULL  020530          4047    4058#
$EOP    020426          4032#
$EOPCT  020454          1402*   4039#   4043
$ERFLG  001103          1275#   4067    4101    4103    4109*   4130    4146*   4200
$ERMAX  001115          1281#   1405*   4103    4125*   4130
$ERROR  021034          1398    4082    4144#
$ERRPC  001116          1282#   4153*   4154*   4155    4161*   4162*   4164    4168*   4169    4200    4214
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$ERRTY  021330          4181    4207#
$ERTTL  001112          1279#   4152*   4200
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$FILLC  001156          1300#   4669    4717
$FILLS  001155          1299#   4717
$GDADR  001120          1283#
$GDDAT  001124          1285#
$GET42  020504          4048#
$GTSWR  022250          4420#   4902
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$HIOCT  021642          4297*   4308#
$ICNT   001104          1276#   4116*   4117    4119*   4129
$INTAG  001135          1290#   4417*   4436    4456    4569
$ITEMB  001114          1280#   4155*   4200    4211
$KTNEX  027332          5405    5459#
$KTOUT  027270          5439    5448#   5457
$KT11   027022          5403#   5407*   5459*   5485*   5439    5961    6002
$LF     001200          1310#   4200    4309    4552    4562    4630    4717
$LPADR  001106          1277#   1406*   4107*   4122*   4127    4129
$LPERR  001110          1278#   1407*   1576*   1618*   1658*   1685*   1730*   1772*   1820*   1955*   2035*   2131*   2182*
                        2252*   2317*   2396*   2490*   2592*   2715*   2825*   2888*   2970*   3039*   3107*   3208*   3341*
                        3456*   3585*   3778*   3894*   4107    4123*   4129    4190
$LSTAD  027446          5474*   5482#   5488    5503*   5509
$LSTBK  027450          5475*   5483#   5491    5493*   5495
$MAIL = ****** U        1424    1434    4122    4184    4653
$MAP    027114          5411*   5415*   5417#   5440    5450
$MAPRG  027120          5412    5419#
$MMOUT  027312          5442    5454#
$MNEW   023122          4423    4567#
$MSWR   023111          4420    4565#
$MXCNT  021032          4120    4129#
$N    = 000035          1084#   1571    1577#   1613    1619#   1653    1659#   1680    1686#   1725    1731#   1767    1773#
                        1815    1821#   1950    1956#   2030    2036#   2126    2132#   2177    2183#   2247    2253#   2312
                        2318#   2391    2397#   2485    2491#   2587    2593#   2710    2716#   2820    2826#   2883    2889#
                        2965    2971#   3034    3040#   3102    3108#   3203    3209#   3336    3342#   3451    3457#   3580
                        3586#   3773    3779#   3889    3895#
$NOMAP  027140          5416    5424#
$NULL   001154          1298#   4671    4717
$NWTST= 000000          1572#   1614#   1654#   1681#   1726#   1768#   1816#   1951#   2031#   2127#   2178#   2248#   2313#
                        2392#   2486#   2588#   2711#   2821#   2884#   2966#   3035#   3103#   3204#   3337#   3452#   3581#
                        3774#   3890#   3994#   4020#
$OCNT   024252          4816*   4845*   4858#
$OMODE  024254          4811*   4815*   4820    4823*   4834*   4860#
$OVER   021016          4084    4100    4108    4118    4126#
$PASS   001100          1273#   4036*   4037*   4045    4058    4114    4130
$QUES   001176          1308#   4200    4306    4309    4474    4545    4562    4628    4630    4717    5111    5160
$RDCHR  022522          4487#   4905
$RDDEC  023134          4584#   4908
$RDLIN  022612          4510#   4906
$RDOCT  021504          4270#   4907
$RDSZ = 000024          4503#
$RTNAD  020526          4057#
$R2A  = ****** U        4909
$SAVRE= ****** U        4909
$SCOPE  020550          1396    4076#
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$SIZE   026736          5386#   5486
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$STOP   027116          5410*   5413*   5418#   5446
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                        1683    1728    1770    1818    1953    2033    2129    2180    2250    2315    2394    2488    2590
                        2713    2823    2886    2968    3037    3105    3206    3339    3454    3583    3776    3892    3996
                        4022    4029    4035    4050    4056    4058    4068    4069    4070    4071    4072    4078    4095
                        4097    4098    4101    4102    4103    4110    4111    4112    4123    4126    4129    4136    4137
                        4138    4139    4140    4149    4156    4184    4188    4200
$SWRMK= 000000          4072    4073    4099
$TERM = 000030          4873    4909#
$TIMES  001166          1305#   1403*   4035*   4110*   4117    4120*   4129
$TKB    001146          1295#   4312    4333    4344    4374    4402    4429    4690    4697    4717
$TKCNT  021644          4313#   4328*   4363    4380*   4494    4496*
$TKINT  021660          1451    1527    4328#   4354    4415
$TKQEN= 021657          4317#   4388    4499
$TKQIN  021646          4314#   4329*   4330    4386*   4387*   4388    4390*
$TKQOU  021650          4315#   4330*   4497    4498*   4499    4501*
$TKQSR  021652          4316#   4329    4390    4501
$TKS    001144          1294#   4312    4334*   4370*   4372    4378*   4400    4416*   4426    4438*   4458*   4688    4695
                        4717
$TKSRV  021730          4331    4344#
$TMP0   001160          1302#   1587*   1588*   1702*   1705*   1853*   1856*   2086*   2090*   2892*   3795*   3798*   3826*
                        3830*   3946*   3950*   5123*   5125    5127    5129    5131*   5132*   5134*   5705*   5706*   5735*
                        5738*   5895*   5898*   5920*   5922*   5932*   5935*   5943*   5946*
$TMP1   001162          1303#   2893*   3924*   3929*   3935*   3964*   5921*   5924*
$TMP2   001164          1304#   3955*   3956*
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                        1726    1728#   1756    1768    1770#   1798    1816    1818#   1937    1951    1953#   2009    2031
                        2033#   2109    2127    2129#   2160    2178    2180#   2230    2248    2250#   2294    2313    2315#
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                        3742    3774    3776#   3844    3890    3892#   3965    3994    3996#   4012    4020    4022#
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$TPFLG  001157          1301#   4647    4717
$TPS    001150          1296#   4704    4717
$TRAP   024256          1400    4869#
$TRAP2  024312          4884#   4895
$TRP  = 000014          4888#   4897#   4898#   4899#   4900#   4901#   4902    4903#   4904    4905#   4906#   4907#   4908#
                        4909#
$TRPAD  024324          4878    4895#   4909
$TSTNM  001102          1274#   1521*   3996*   4034*   4067    4099    4121*   4126    4130    4148    4200
$TTYIN  023046          4512    4513    4525    4543    4557    4561#
$TYPBN= ****** U        4901
$TYPDS  023604          4729#   4900
$TYPE   023312          4647#   4888    4896
$TYPEC  023462          4460    4668    4675    4682    4687#
$TYPEX  023602          4710    4712    4715#
$TYPOC  024054          4814#   4897
$TYPON  024070          4813    4816#   4899
$TYPOS  024030          4809#   4898
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$XON  = 000021          4346    4699    4717
$XTSTR  020574          4086#
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.       = 053260         1236#   1252    1256#   1261#   1271#   1311    1393    1406    1407    1455#   1468#   4058    4062
                         4129    4130    4200    4255#   4309    4312    4316#   4317    4318#   4561#   4562    4569#   4630
                         4717    4783#   4874    4876    4909    4950#   5024#   5037#   5042#   5048#   5056#   5066#   5105#
                         5145#   5670#   5673#   6119    6401#   7603#   7605#   7606#
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ABORT	999#	2303	2382											
ALTBUF	1009#	2700												
ALTSTA	1004#	2476	2578											
BSEADR	1019#	3193												
CHRCNT	1014#	3091												
COMMEN	1199#													
DATADR	1024#	3326	3441											
DATTST	1030#	3566												
ENDCOM	1199#													
ERR	944#	1600	1640	1669	1708	1751	1793	1931	2015	2115	2165	2235	2299	2377	2471
	2573	2695	2800	2869	2949	3018	3087	3186	3321	3433	3558	3752	3848	3970	
ERROR	1093#	1600	1640	1669	1708	1751	1793	1931	2015	2115	2165	2235	2299	2377	2471
	2573	2695	2800	2869	2949	3018	3087	3186	3321	3434	3559	3752	3848	3970	
ESCAPE	1199#													
GETPRI	1199#	5399												
GETSWR	1199#	1431#												
INRDY	948#	1603												
INTIN	1032#	3755												
INTOUT	1033#	3872												
INTTST	944#	1564												
IOBUFI	966#	1717	1759											
KMCSER	1038#	5619												
LININT	958#	1672												
LINOVR	979#	1940												
LRCTST	1014#	2953												
MUL	1199#													
NABORT	999#	2168	2239											
NEWTST	1199#	1572	1614	1654	1681	1726	1768	1816	1951	2031	2127	2178	2248	2313	2392
	2486	2588	2711	2821	2884	2966	3035	3103	3204	3337	3452	3581	3774	3890	3994
	4020														
NOOUT	953#	1647												
NXM	1014#	2810												
PARTAB	938#	4910												
PARTST	1014#	3022												
PASS	1034#	3994												
POP	1199#	4298	4619	4770										
PUMP	939#	5571												
PUSH	1199#	4272	4586	4729										
REPORT	1199#													
RSTRCV	984#	2018												
RSTXMT	989#	2118												
SCOPE	1094#	1573	1615	1655	1682	1727	1769	1817	1952	2032	2128	2179	2249	2314	2393
	2487	2589	2712	2822	2885	2967	3036	3104	3205	3338	3453	3582	3775	3891	3995
	4021	4033													
SETPRI	1199#	4490													
SETTRA	4888#	4897	4898	4899	4900	4902	4904	4905	4906	4907	4908				
SETUP	1199#	1387													
SKIP	1199#	1635	1666	1713	1756	1798	1937	2009	2108	2160	2230	2294	2373	2467	2567
	2689	2804	2864	2941	3011	3080	3179	3316	3437	3562	3741	3844	3965	4012	
SLASH	1199#														
SPACE	1199#														
STARS	1199#	1267	1311	1564	1570	1572	1603	1612	1614	1647	1652	1654	1672	1678	1681
	1717	1723	1726	1759	1765	1768	1801	1813	1816	1940	1948	1951	2019	2028	2031
	2118	2124	2127	2168	2175	2178	2245	2248	2303	2311	2313	2382	2390	2392	2476
	2483	2486	2578	2585	2588	2700	2708	2711	2811	2818	2821	2873	2881	2884	2954
	2963	2966	3023	3032	3035	3092	3100	3103	3194	3201	3204	3327	3334	3337	3442

```
        3449    3452    3567    3581    3755    3771    3774    3872    3885    3890    3994    4020    4025    4064    4132
        4202    4258    4311    4393    4408    4479    4503    4572    4632    4719    4786    4863    5372
SWRSU   1199#  1408#
TABLES  1068#  6131
TERMXB  1014#  2872
TRMTRP  4888#  4909
TYPBIN  1199#
TYPDEC  1199#  4045    4242    5654
TYPNAM  1199#  1424
TYPNUM  1199#
TYPOCS  1199#
TYPOCT  1199#  4164    4169    4214    4239    4421
TYPTXT  1199#  1452    1464    4946    4955    5005    5011    5021    5034    5039    5045    5053    5063    5068    5081
        5086    5102    5141    5185    5604    5643    5650    5662    5666
XRTST    970#  1801
$CLKAL  1040#  2324    2403    2498    2600
$CLRTA  1049#
$GETCO   944#  5484
$GETCS  1054#  1750    1792    1930    2013    2113    2163    2234    2298    2376    2470    2572    2694    2799    2867
        2948    3016    3085    3184    3750    3846    3968
$GETKM  1063#  1519    4011
$GETLI  1057#  1711    1754    1796    1935    2008    2107    2159    2228    2292    2336    2372    2415    2466    2509
        2518    2566    2611    2620    2688    2802    2863    3178    3313    3739    5765    5794
$GETPH   944#  5536
$INPDU  1062#  1746    1788    2060    2208    2278    2351    2430    2534    2636    5751    5814    5835    5887
$INTAL  1048#  2322    2401    2496    2598    2720
$INTKM  1040#  1621    1661    1688    1733    1775    1824    1958    2038    2134    2185    2255    2320    2399    2494
        2596    2718    2828    2899    2978    3047    3129    3248    3357    3472    3599    3781    3804    3820    3897
$INTLI  1041#  5763    5781
$INTLN  1050#  1827    1960    2040    2136    2187    2257    2830    2901    2980    3049    3131    3250    3360    3475
        3601    3910
$INTRE  1060#  3365
$INTTR  1061#  3480
$LRSET  1055#  2147
$MAPBU  1058#  3615
$PARAM   938#  5216
$PARCK  1066#
$REQNC  1045#  2054    2200    2422    2629    5807    5880
$REQNI  1046#  1692    5761    5778
$REQNR  1042#  1779    5824
$REQNT  1043#  1737    5828
$REQNX  1047#  2270    2343    2527
$REQOU  1056#  1892    1982    1988    2155    2214    2283    2357    2444    2461    2539    2649    2670    2751    2796
        2854    2917    2994    3064    3150    3273    3383    3502    3632    3925
$RIN    1052#  1839    1843    1972    2050    2068    2266    2413    2609    2618    2685    2731    2841    2908    2986
        3055    3139    3261    3368    3487    3619    3916    3938
$STCLK  1051#  1830    1962    2042    2063    2150    2189    2259    2722    2832    2903    3133    3252    3362    3477
        3603    3791    3806    3822    3912    5791
$SYNTI  1064#  1628    1633    2152    2916    2993    3063    3812
$TSTDA  1059#
$TSTN    944#  1571    1613    1653    1680    1725    1767    1815    1950    2030    2126    2177    2247    2312    2391
        2485    2587    2710    2820    2883    2965    3034    3102    3203    3336    3451    3580    3773    3889
$XIN    1053#  1849    1977    2074    2143    2196    2334    2439    2507    2516    2563    2644    2740    2849    2913
        2990    3059    3142    3268    3375    3494    3625    3920    3942
$$CMRE  1265#
$$CMTM  1265#  1302    1303    1304
```

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$$ESCA   1199#
$$NEWT   1199#  1572  1614  1654  1681  1726  1768  1816  1951  2031  2127  2178  2248  2313  2392
         2486   2588  2711  2821  2884  2966  3035  3103  3204  3337  3452  3581  3774  3890  3994
         4020
$$SET    4888#  4897  4898  4899  4900  4902  4904  4905  4906  4907  4908
$$SKIP   1199#  1635  1666  1713  1756  1798  1937  2009  2109  2160  2230  2294  2373  2467  2568
         2690   2805  2864  2942  3012  3081  3180  3316  3438  3563  3742  3844  3965  4012
.EQUAT   1070#  1089
.HEADE   1070#
.KT11    1070#  1199
.SETLN    938#  5614
.SETUP   1070#  1265
.SWRHI   1070#
.$CMTA   1070#  1265
.$EOP    1070#  4023
.$ERRO   1070#  4130
.$ERRT   1070#  4200
.$GETK    938#  5318
.$RDDE   1070#  4570
.$RDOC   1070#  4256
.$READ   1070#  4309
.$SCOP   1070#  4062
.$SIZE   1070#  5370
.$TRAP   1070#  4861
.$TYPD   1070#  4717
.$TYPE   1070#  4630
.$TYPO   1070#  4784
.$40CA   1070#  1234


. ABS.  053260     000

 ERRORS DETECTED:  0

 CZKMEA,CZKMEA/CRF/SOL/NL:TOC=CZKMEA
 RUN-TIME:  134 108 7 SECONDS
 RUN-TIME RATIO: 1513/250=6.0
 CORE USED:  52K  (103 PAGES)
```