

11/21+  
KMV11B

KMV11B LINE CNT DIAG  
CNKMEAO

COPYRIGHT (c) 1979-84  
AH-T849A-MC  
FICHE 01 OF 01

OCT 1984  
digital  
Made In USA

The microfiche card displays a grid of 120 small diagrams or data tables, arranged in 10 rows and 12 columns. Each cell contains a small-scale version of the same content, likely representing a line count diagram for a KMV11B component. The diagrams are arranged in a regular grid pattern across the card.

1  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42

.NLIST TOC  
.REM @

IDENTIFICATION  
-----

PRODUCT CODE: AC-T848A-MC  
PRODUCT NAME: CNKMEAO KMV11B LINE CNT DIAG  
PRODUCT DATE: JULY 1984  
MAINTAINER: CSS ANNECY  
AUTHOR: MICHELET GUY  
MODIFIED BY: JAKI BERG 9-JUL-1984

THE INFORMATION IN THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE AND SHOULD NOT BE CONSTRUED AS A COMMITMENT BY DIGITAL EQUIPMENT CORPORATION. DIGITAL EQUIPMENT CORPORATION ASSUMES NO RESPONSIBILITY FOR ANY ERRORS THAT MAY APPEAR IN THIS DOCUMENT.

NO RESPONSIBILITY IS ASSUMED FOR THE USE OR RELIABILITY OF SOFTWARE ON EQUIPMENT THAT IS NOT SUPPLIED BY DIGITAL OR ITS AFFILIATED COMPANIES.

COPYRIGHT (C) 1984 BY DIGITAL EQUIPMENT CORPORATION

THE FOLLOWING ARE TRADEMARKS OF DIGITAL EQUIPMENT CORPORATION:

DIGITAL	PDP	UNIBUS	MASSBUS
DEC	DECUS	DECTAPE	

PROGRAM DOCUMENT

44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

\*\*\*\*\* MODIFICATION HISTORY \*\*\*\*\*

REV A: ORIGINAL RELEASE GUY MICHELET 14-JAN-81

REV B: BUG FIX GUY MICHELET APRIL 83  
WRONG CLOCK DIVIDER VALUE IN TWO TEST.

CVKMEB => CNKMEA JAKI BERG 9-JUL-84  
CHANGES WERE MADE TO CVKMEB TO PRODUCE CNDMEA FOR THE FALCON-PLUS PROJECT  
(SBC-11/21\*). CHANGES, MARKED BY ";JB REV A-0", ARE:  
- SET THE ODT BREAK VECTOR (LOCATION 140) TO THE STARTING ADDRESS OF  
FALCON'S ODT ROM (170000-OCTAL).  
- LOWER THE INTERRUPT PRIORITY FROM 7 TO 6 TO ALLOW THE <BREAK> KEY TO  
INTERRUPT.

PROGRAM DOCUMENT

62  
63  
64  
65  
66  
67  
68  
69  
70  
71  
72  
73  
74  
75  
76  
77  
78  
79  
80  
81  
82  
83  
84  
85  
86  
87  
88  
89  
90  
91  
92  
93  
94  
95  
96  
97  
98  
99  
100  
101  
102  
103  
104  
105  
106  
107  
108  
109  
110  
111  
112  
113  
114

TABLE OF CONTENTS

- 1.0 INTRODUCTION
  - 1.1 PROGRAM ABSTRACT
  - 1.2 HARDWARE INTRODUCTION
  - 1.3 DIAGNOSTIC DESCRIPTION
- 2.0 HARDWARE REQUIREMENTS
- 3.0 PRELIMINARY PROGRAM REQUIREMENTS
- 4.0 GENERAL PROGRAM CONSIDERATIONS
  - 4.1 DIAGNOSTIC SUPERVISOR
  - 4.2 EXECUTION TIME
- 5.0 PROGRAM LOAD MEDIA
- 6.0 OPERATING INSTRUCTIONS
  - 6.1 LOADING AND STARTING PROCEDURES
    - 6.1.1 LOADING PROCEDURES
    - 6.1.2 STARTING PROCEDURES
    - 6.1.3 STEPS FOR QUICK AND SIMPLE EXECUTION
  - 6.2 INITIAL DIALOGUE
  - 6.3 PROGRAM OPTIONS
    - 6.3.1 START COMMAND
    - 6.3.2 RESTART COMMAND
    - 6.3.3 CONTINUE COMMAND
    - 6.3.4 PROCEED COMMAND
    - 6.3.5 ADD COMMAND
    - 6.3.6 DROP COMMAND
    - 6.3.7 PRINT COMMAND
    - 6.3.8 DISPLAY COMMAND
    - 6.3.9 FLAGS COMMAND
    - 6.3.10 ZFLAGS COMMAND
    - 6.3.11 CONTROL CHARACTERS
    - 6.3.12 HARDWARE PARAMETERS
    - 6.3.13 SOFTWARE PARAMETERS
    - 6.3.14 EXTENDED DISCUSSION OF P-TABLE DIALOGUE
- 7.0 TEST DESCRIPTIONS
- 8.0 ERROR INFORMATION
  - 8.1 ERROR REPORTING

PROGRAM DOCUMENT

116  
117  
118  
119  
120  
121  
122  
123  
124  
125  
126  
127  
128  
129  
130  
131  
132  
133  
134  
135  
136  
137  
138  
139  
140  
141  
142  
143  
144  
145  
146  
147  
148  
149  
150  
151  
152  
153  
154  
155  
156  
157  
158  
159  
160  
161  
162  
163  
164  
165  
166  
167  
168  
169  
170  
171  
172

1.0 INTRODUCTION

1.1 PROGRAM ABSTRACT

THIS DIAGNOSTIC WAS DESIGNED TO TEST OUT THE KMV11 MODULE  
THE PROGRAM WAS IMPLEMENTED USING THE DIAGNOSTIC SUPERVISOR.  
THROUGH DIALOGUE WITH THE OPERATOR, THE PROGRAM WILL ALLOW  
MODIFICATION OF DEVICE PARAMETERS, SUCH AS QBUS ADDRESS,  
VECTOR ADDRESS, AND PROCESSOR TYPE.

1.2 HARDWARE INTRODUCTION

THIS DIAGNOSTIC WILL TEST ALL THE HARDWARE PART OF THE KMV11 B  
MODULE (M7501).  
TO TEST COMPLETELY THIS PART ,EXTERNAL LOOP BACK CONNECTOR  
MUST BE INSTALLED.  
DIAGNOSTIC WILL AUTOMATICALLY DETECT IF LOOPBACK CONNECTOR IS  
PLUGGED OR NOT (IF NOT ,EXTERNAL TEST IS DROPPED AND REPORTS  
THE ERROR)

EXTERNAL LOOP BACK CONNECTOR:

-----  
KMV11 B CAN OPERATE EITHER IN RS422 OR RS 423  
FOR RS422 MODEM SIGNAL 103,104,114,AND 115 ARE SUPPORTED.  
FOR RS 423 MODEM SIGNAL 103,104,105,107,108,106,109,113,114,115  
ARE SUPPORTED.

RS422 LOOP BACK:

TO TEST KMV11 B IN RS422 MODE ,RUN THIS DIAGNOSTIC  
WITH THE ZIF LOOP BACK CONNECTOR 2P-E155A-00 PLUG ON THE ZIF  
SOCKET (12-11591-35)AT THE END OF BC05 CABLE

RS423 LOOP BACK:

TO TEST COMPLETELY A KMV11 B IN RS423 MODE ,RUN THIS DIAGNOSTIC  
WITH ZIF LOOP BACK CONNECTOR 2P-E156A-00 PLUG ON THE ZIF  
SOCKET (12-11591-35) AT THE END OF BC05 CABLE.

RS423 LOOP BACK:

DIAGNOSTIC WILL TEST KMV11 CLOCKS,LINE INTERUPTS, TX AND RX FUCTION  
IN INTERNAL AND EXTERNAL LOOP BACK AND MODEM SIGNALS.

## PROGRAM DOCUMENT

173  
174  
175  
176  
177  
178  
179  
180  
181  
182  
183  
184  
185  
186  
187  
188  
189  
190  
191  
192  
193  
194  
195  
196  
197  
198  
199  
200  
201  
202  
203  
204  
205  
206  
207  
208  
209  
210

## CAUTION:

\*\*\*\*\*

IF LOOP BACK CONNECTORS ARE NOT PLUGED IN BOTH CHANNEL A AND B,  
THE DIAGNOSTIC WILL AUTOMATICALLY REPORT AN ERROR AND DROP THE  
TEST FOR THE EXTERNAL LOOP BACK.

KMOV11 B IS FULLY TESTED ONLY WHEN DIAGNOSTIC HAS BEEN RUN  
SUCCESSFULLY IN BOTH RS422 AND RS423 LOOP BACK.

## 2.0 HARDWARE REQUIREMENTS

THE FOLLOWING HARDWARE IS REQUIRED TO RUN THE KMOV11B  
LINE CONTROLLER STATIC TESTS:

SBC-11/21 +  
16K MEMORY  
CONSOLE TERMINAL

## 3.0 PRELIMINARY PROGRAM REQUIREMENTS

THE PROCESSOR AND MEMORY SHOULD BE THOROUGHLY TESTED PRIOR  
TO RUNNING THIS DIAGNOSTIC.

## 4.0 GENERAL PROGRAM CONSIDERATIONS

## 4.1 DIAGNOSTIC SUPERVISOR

THIS PROGRAM IS COMPATIBLE WITH THE STANDALONE DIAGNOSTIC  
SUPERVISOR, AND MUST BE LOADED TO BE CO-RESIDENT WITH THE  
SUPERVISOR, OR BE PREVIOUSLY COMBINED WITH THE SUPERVISOR

## PROGRAM DOCUMENT

212  
213  
214  
215  
216  
217  
218  
219  
220  
221  
222  
223  
224  
225  
226  
227  
228  
229  
230  
231  
232  
233  
234  
235  
236  
237  
238  
239  
240  
241  
242  
243  
244  
245  
246  
247  
248  
249  
250  
251  
252  
253  
254  
255  
256  
257  
258  
259  
260  
261  
262  
263  
264  
265  
266  
267  
268

AND LOADED AS A SINGLE FILE. IN EITHER CASE, THE COMBINED PROGRAM WILL NOT EXCEED 16K OF MEMORY.

#### 4.2 EXECUTION TIME

THE TOTAL TIME REQUIRED TO RUN THE KMV11 STATIC TESTS IS ABOUT 330 SECONDS PER PASS FOR EACH UNIT.

#### 4.3 XXDP+

THIS PROGRAM MAY BE LOADED UNDER XXDP+, AND MAY BE RUN IN DUMP MODE OR CHAIN MODE.

#### 4.4 ACT/SLIDE

THIS PROGRAM MAY BE LOADED UNDER ACT OR SLIDE AND MAY BE RUN IN DUMP MODE OR CHAIN MODE.

#### 4.5 APT

THIS PROGRAM MAY BE LOADED BY THE APT SYSTEM (INCLUDING APT-RD) AND RUN IN PROGRAM MODE OR SCRIPT MODE.

#### 4.6 MEMORY MANAGEMENT

MEMORY MANAGEMENT IS NOT UTILIZED IN THIS PROGRAM. IF IT IS INSTALLED, IT IS DISABLED BY THE PROGRAM.

#### 4.7 MEMORY PARITY OPTION

IF PARITY MEMORY IS INSTALLED, MEMORY PARITY TRAPS ARE DISABLED BY THE PROGRAM.

#### 4.8 ERROR LOGGING

THE NUMBER OF ERRORS WHICH HAVE OCCURRED ON EACH DEVICE UNDER TEST SINCE THE LAST START OR RESTART COMMAND IS KEPT IN AN ERROR LOG. THIS LOG MAY BE PRINTED BY USING THE "PRINT" COMMAND (SEE SECTION 6.3.8).

#### 5.0 PROGRAM LOAD MEDIA

THIS PROGRAM CAN BE LOADED FROM PAPER TAPE USING THE ABSOLUTE LOADER OR FROM ACT, SLIDE, OR APT SYSTEMS, OR FROM

## PROGRAM DOCUMENT

270  
271  
272  
273  
274  
275  
276  
277  
278  
279  
280  
281  
282  
283  
284  
285  
286  
287  
288  
289  
290  
291  
292  
293  
294  
295  
296  
297  
298  
299  
300  
301  
302  
303  
304  
305  
306  
307  
308  
309  
310  
311  
312  
313  
314  
315  
316  
317  
318  
319  
320  
321  
322  
323  
324

ANY MEDIA SUPPORTED BY XXDP+. WHEN USING THE PAPER TAPE ABSOLUTE LOADER, THE PROGRAM SHOULD BE LOADED FIRST, FOLLOWED BY THE DIAGNOSTIC SUPERVISOR. WHEN USING XXDP+, THE DIAGNOSTIC SUPERVISOR SHOULD BE LOADED FIRST, FOLLOWED BY THE DIAGNOSTIC PROGRAM.

## 6.0 OPERATING INSTRUCTIONS

### 6.1 LOADING AND STARTING PROCEDURES

#### 6.1.1 LOADING PROCEDURES

THIS PROGRAM MAY BE LOADED FROM PAPER TAPE USING THE ABSOLUTE LOADER. IT MAY ALSO BE LOADED FROM ANY XXDP+ LOAD MEDIA. WHEN LOADED UNDER XXDP+, THE DIAGNOSTIC SUPERVISOR WILL BE LOADED AUTOMATICALLY.

#### 6.1.2 STARTING PROCEDURES

THE PROGRAM STARTS AT LOCATION 200. USE STANDARD DEC PROCEDURES TO START THE PROGRAM.

#### 6.1.3 STEPS FOR QUICK AND SIMPLE EXECUTION

THE DIAGNOSTIC CAN BE EXECUTED STANDALONE UNDER XXDP+ WITHOUT READING THE REMAINDER OF THIS DOCUMENT, AS FOLLOWS:

- A) LOAD AND START DIAGNOSTIC USING RUN COMMAND
- B) RECEIVE DIAGNOSTIC SUPERVISOR PROMPT (DR>)
- C) ENTER STA<CR>
- D) ANSWER HARDWARE AND SOFTWARE QUESTIONS
- E) GET END OF PASS MESSAGES OR ERROR MESSAGES
- F) TO END EXECUTION, ENTER CONTROL/C

### 6.2 INITIAL DIALOGUE

AFTER THE PROGRAM AND THE SUPERVISOR ARE LOADED AND THE PROGRAM IS STARTED, THE FOLLOWING IDENTIFICATION IS TYPED:

```
DRS LOADED
DIAG. RUN-TIME SERVICES
NKMEAO
KMV11 B LINE CONTROLLER DIAGNOSTIC
DR>
```



PROGRAM DOCUMENT

326  
327  
328  
329  
330  
331  
332  
333  
334  
335  
336  
337  
338  
339  
340  
341  
342  
343  
344  
345  
346  
347  
348  
349  
350  
351  
352  
353  
354  
355  
356  
357  
358  
359  
360  
361  
362  
363  
364  
365  
366  
367  
368  
369  
370  
371  
372  
373  
374  
375  
376  
377  
378  
379  
380  
381  
382

THE OPERATOR THEN PROCEEDS BY TYPING ONE OR MORE OF THE COMMANDS DESCRIBED IN THE FOLLOWING SECTION 6.3.(FOR MORE DETAILED INFORMATION, REFER TO THE DIAGNOSTIC SUPERVISOR FUNCTIONAL SPECIFICATION).

6.3 PROGRAM OPTIONS

6.3.1 START COMMAND

\*\*\*\*\*  
STA(RT)/TESTS:<TEST-LIST>/PASS:<PASS-CNT>/FLAGS:  
<FLAG-LIST>/EOP:<INCR>  
\*\*\*\*\*

6.3.1.1 TESTS SWITCH (/TESTS:<TEST-LIST>)

<TEST-LIST> IS A SEQUENCE OF DECIMAL NUMBERS (1:2 ETC.) OR RANGES OF DECIMAL NUMBERS (1-5:8-10 ETC.) THAT SPECIFY THE TESTS TO BE EXECUTED. THE NUMBERS ARE SEPARATED BY COLONS. THE NUMBERS RANGE FROM 1 TO THE LARGEST TEST NUMBER IN THE DIAGNOSTIC. THEY MAY BE SPECIFIED IN ANY ORDER. TESTS WILL BE EXECUTED IN NUMERICAL ORDER REGARDLESS OF THE ORDER OF SPECIFICATION. THE DEFAULT IS TO EXECUTE ALL TESTS. ON THIS AND ALL SWITCHES, THE ANGLE BRACKETS <> ARE PUNCTUATION USED IN THE DEFINITION ONLY, AND ARE NOT TO BE TYPED BY THE OPERATOR. SEE EXAMPLE AT END OF 6.3.1.5.

6.3.1.2 PASS SWITCH (/PASS:<PASS-CNT>)

<PASS-CNT> IS A DECIMAL NUMBER INDICATING THE DESIRED NUMBER OF PASSES. A PASS IS DEFINED AS THE EXECUTION OF THE FULL DIAGNOSTIC (ALL SELECTED TESTS) AGAINST ALL UNITS SUBMITTED. THE DEFAULT IS NON-ENDING EXECUTION. IN THIS CASE EXIT FROM THE PROGRAM IS ACCOMPLISHED EITHER BY TYPING A CONTROL/C OR BY OCCURANCE OF AN ERROR WITH THE HALT ON ERROR FLAG BEING SET. THE EXIT IS A RETURN TO COMMAND MODE. SEE EXAMPLE AT END OF 6.3.1.5.

6.3.1.3 FLAGS SWITCH (/FLAGS:<FLAG-LIST>)

<FLAG-LIST> IS A SEQUENCE OF ELEMENTS OF THE FORM <FLAG>, <FLAG=1>, OR <FLAG=0>, SEPARATED BY COLONS, WHERE <FLAG> HAS ONE OF THE FOLLOWING VALUES:

- HOE HALT ON ERROR, CAUSING COMMAND MODE TO BE ENTERED WHEN AN ERROR IS ENCOUNTERED
- LOE LOOP ON ERROR, CAUSING THE DIAGNOSTIC TO LOOP

## PROGRAM DOCUMENT

384  
385  
386  
387  
388  
389  
390  
391  
392  
393  
394  
395  
396  
397  
398  
399  
400  
401  
402  
403  
404  
405  
406  
407  
408  
409  
410  
411  
412  
413  
414  
415  
416  
417  
418  
419  
420  
421  
422  
423  
424  
425  
426  
427  
428  
429  
430  
431  
432  
433  
434  
435  
436  
437  
438

CONTINUOUSLY WITHIN THE SMALLEST DEFINED BLOCK OF CODING (SEGMENT, SUBTEST, OR TEST) CONTAINING THE ERROR

IER	INHIBIT ERROR REPORTING
IBE	INHIBIT BASIC ERROR REPORTS
IXE	INHIBIT EXTENDED ERROR REPORTS
PRI	DIRECT ALL MESSAGES TO A LINE PRINTER
PNT	PRINT NUMBER OF TEST BEING EXECUTED
BOE	BELL ON ERROR
UAM	RUN IN UNATTENDED MODE, BYPASSING MANUAL INTERVENTION TESTS
ISR	INHIBIT STATISTICAL REPORTS
IDU	INHIBIT DROPPING OF UNITS BY DIAGNOSTIC
LOT	LOOP ON TEST

THE FLAGS NAMED OR EQUATED TO 1 ARE SET, THOSE EQUATED TO 0 ARE CLEARED. A FLAG NOT SPECIFIED IS CLEARED. IF THE FLAGS SWITCH IS NOT GIVEN ALL FLAGS ARE CLEARED. SEE EXAMPLE AT END OF 6.3.1.5.

#### 6.3.1.4 END OF PASS SWITCH (/EOP:<INCR>)

<INCR> IS A DECIMAL NUMBER INDICATING HOW OFTEN (IN TERMS OF PASSES) IT IS DESIRED THAT THE END OF PASS MESSAGE BE PRINTED. THE DEFAULT IS AT THE END OF EVERY PASS. SEE EXAMPLE AT END OF 6.3.1.5.

#### 6.3.1.5 EFFECT OF START COMMAND

THE EFFECT OF THE START COMMAND IS TO INITIATE THE HARDWARE PARAMETER DIALOGUE, THE SOFTWARE PARAMETER DIALOGUE, AND THEN THE DIAGNOSTIC TESTS THEMSELVES.

THE HARDWARE PARAMETER DIALOGUE COMMENCES WITH THE QUESTION "# UNITS?" TO WHICH THE OPERATOR REPLIES WITH A DECIMAL NUMBER N FROM 1 TO 16. THE TERM "UNIT" REFERS TO THE DEVICE TO WHICH THIS SERIES OF DIAGNOSTICS IS DEDICATED. FOLLOWING THIS ARE THE QUESTIONS WHEREBY THE P-TABLES THEMSELVES WILL BE BUILT. EACH P-TABLE IS A CORE-RESIDENT TABLE CONTAINING ALL THE HARDWARE INFORMATION FOR ONE UNIT. THE OPERATOR MUST SUPPLY N (NUMBER OF UNITS) VALUES FOR EACH QUESTION. HE MAY DO THIS BY GIVING ONE ANSWER TO EACH QUESTION (IN WHICH CASE THE SERIES OF QUESTIONS WILL BE POSED N TIMES) OR BY GIVING N VALUES, SEPARATED BY COMMAS, TO EACH QUESTION (SERIES WILL BE POSED ONCE). EACH QUESTION IS FOLLOWED BY THE RESPONSE RADIX (D FOR DECIMAL, B FOR BINARY, O FOR OCTAL, L FOR YES/NO) IN PARENTHESES AND THE DEFAULT VALUE AFTER THE PARENTHESES.

PROGRAM DOCUMENT

440  
441  
442  
443  
444  
445  
446  
447  
448  
449  
450  
451  
452  
453  
454  
455  
456  
457  
458  
459  
460  
461  
462  
463  
464  
465  
466  
467  
468  
469  
470  
471  
472  
473  
474  
475  
476  
477  
478  
479  
480  
481  
482  
483  
484  
485  
486  
487  
488  
489  
490  
491  
492  
493  
494

FOLLOWING THE HARDWARE QUESTIONS ARE THE SOFTWARE QUESTIONS TO BUILD THE SOFTWARE TABLES, WHICH DEFINE THE MODE (QUICK VERIFY ETC.) THAT THE DIAGNOSTIC WILL EXECUTE IN.

WHEN THE QUESTION "# UNITS?" IS ANSWERED, MEMORY STORAGE IS ALLOCATED FOR THE P-TABLES, AND IF THERE IS NOT ENOUGH TO ACCOMMODATE THEM THE MESSAGE "TOO MANY UNITS" IS ISSUED. IN THIS CASE THE DIAGNOSTIC MUST BE EXECUTED MORE THAN ONCE TO TEST ALL UNITS.

EXAMPLE:

STA/TESTS:1:2-4:6:8-10/PASS:3/FLAGS:IER:HOE=1:UAM:LOE

THIS COMMAND WILL CAUSE THREE PASSES TO BE MADE, EACH PASS CONSISTING OF TESTS 1,2,3,4,6,8,9, AND 10 EXECUTED AGAINST ALL UNITS. THERE IS NO DIFFERENCE BETWEEN SAYING <FLAG> AND SAYING <FLAG=1>. THE NOTATION <FLAG=0> IS MEANINGFUL ONLY ON A COMMAND OTHER THAN START TO CLEAR A FLAG THAT WAS PREVIOUSLY SET. NOTE THAT ON ALL COMMANDS ONLY THE FIRST THREE LETTERS ARE SCANNED.

6.3.2 RESTART COMMAND

\*\*\*\*\*  
RES(TART)/TESTS:<TEST-LIST>/PASS:<PASS-CNT>/FLAGS:  
<FLAG-LIST>/UNITS:<UNIT-LIST>  
\*\*\*\*\*

6.3.2.1 TESTS, PASS, AND FLAGS SWITCHES

<TEST-LIST>, <PASS-CNT>, AND <FLAG-LIST> ARE AS IN THE START COMMAND.

6.3.2.2 UNITS SWITCH (/UNITS:<UNIT-LIST>)

<UNIT-LIST> IS A SEQUENCE OF DECIMAL NUMBERS (0,1 ETC.) OR RANGES OF DECIMAL NUMBERS (0-5, 8-10 ETC.) THAT SPECIFY THE UNITS TO BE TESTED. THE NUMBERS ARE SEPARATED BY COLONS. THE NUMBERS MAY RANGE FROM 0 THRU N-1 (N IS THE NUMBER OF UNITS SPECIFIED IN THE PREVIOUS START COMMAND). THE NUMBER INDICATES THE POSITION OF THE P-TABLE AS THE DATA WAS ENTERED DURING THE HARDWARE DIALOGUE. THE UNITS WHICH ARE SELECTED MUST NOT HAVE BEEN DROPPED BY THE DROP COMMAND. SEE THE DISCUSSION OF ADD AND DROP COMMANDS BELOW. DEFAULT IS TO TEST ALL UNITS WHICH HAVE NOT BEEN DROPPED BY A DROP COMMAND.

PROGRAM DOCUMENT

496  
497  
498  
499  
500  
501  
502  
503  
504  
505  
506  
507  
508  
509  
510  
511  
512  
513  
514  
515  
516  
517  
518  
519  
520  
521  
522  
523  
524  
525  
526  
527  
528  
529  
530  
531  
532  
533  
534  
535  
536  
537  
538  
539  
540  
541  
542  
543  
544  
545  
546  
547  
548  
549

6.3.2.3 EFFECT OF RESTART COMMAND

THE RESTART COMMAND DIFFERS FROM THE START COMMAND IN THAT THE P-TABLES FROM THE PREVIOUS START COMMAND (THERE MUST HAVE BEEN ONE) ARE USED, INSTEAD OF NEW ONES BEING BUILT. THE UNITS SWITCH GIVES THE ABILITY TO SELECT A SUBSET OF THESE. THE SOFTWARE DIALOGUE MAY OPTIONALLY BE REEXECUTED (OPERATOR WILL BE ASKED). THE COMMAND CAN BE USED AFTER COMMAND MODE HAS BEEN REENTERED IN ANY OF THE THREE NORMAL WAYS: A) THE REQUESTED NUMBER OF PASSES HAVE BEEN MADE B) AN ERROR WAS ENCOUNTERED WITH THE HALT ON ERROR FLAG SET C) A CONTROL/C WAS ENTERED BY THE OPERATOR.

6.3.3 CONTINUE COMMAND

\*\*\*\*\*  
CON(TINUE)/PASS:<PASS-CNT/FLAGS:<FLAG-LIST>  
\*\*\*\*\*

6.3.3.1 PASS SWITCH (/PASS:<PASS-CNT>)

<PASS-CNT> IS SAME AS IN START COMMAND, BUT THE DEFAULT IS THE UNSATISFIED PASS-CNT FROM THE PREVIOUS START OR RESTART. IF NONE REMAINS, THE DEFAULT IS NON-ENDING EXECUTION.

6.3.3.2 FLAG SWITCH (/FLAGS:<FLAG-LIST>)

<FLAG-LIST> IS SAME AS IN START COMMAND, BUT UNSPECIFIED FLAGS RETAIN THEIR CURRENT VALUE.

6.3.3.3 EFFECT OF CONTINUE COMMAND

CONTINUE MUST FOLLOW A START OR RESTART, AND COMMAND MODE MUST HAVE BEEN ENTERED DUE TO A HALT ON ERROR OR A CONTROL/C. THE EFFECT OF THE COMMAND IS TO GO TO THE BEGINNING OF THE TEST THAT WAS BEING EXECUTED WHEN THE HALT OR CONTROL/C TOOK PLACE. SOFTWARE DIALOGUE MAY OPTIONALLY BE REEXECUTED. HARDWARE PARAMETERS MAY NOT BE CHANGED.

6.3.4 PROCEED COMMAND

\*\*\*\*\*  
PRO(CEED)/FLAGS:<FLAG-LIST>  
\*\*\*\*\*

PROGRAM DOCUMENT

551  
552  
553  
554  
555  
556  
557  
558  
559  
560  
561  
562  
563  
564  
565  
566  
567  
568  
569  
570  
571  
572  
573  
574  
575  
576  
577  
578  
579  
580  
581  
582  
583  
584  
585  
586  
587  
588  
589  
590  
591  
592  
593  
594  
595  
596  
597  
598  
599  
600  
601  
602  
603  
604  
605

6.3.4.1 FLAGS SWITCH (/FLAGS:<FLAG-LIST>)

<FLAG-LIST> IS AS IN THE START COMMAND, BUT UNSPECIFIED  
FLAGS RETAIN THEIR CURRENT VALUE.

6.3.4.2 EFFECT OF PROCEED COMMAND

PROCEED MUST FOLLOW A START, RESTART, OR CONTINUE. COMMAND  
MODE MUST HAVE BEEN ENTERED VIA A HALT ON ERROR. THE EFFECT  
OF THE COMMAND IS TO BEGIN EXECUTION AT THE LOCATION  
FOLLOWING THE ERROR CALL. NEITHER HARDWARE NOR SOFTWARE  
PARAMETERS MAY BE ALTERED.

6.3.5 ADD COMMAND

\*\*\*\*\*  
ADD/UNITS:<UNIT-LIST>  
\*\*\*\*\*

6.3.5.1 UNITS SWITCH (/UNITS:<UNIT-LIST>)

<UNIT-LIST> IS AS IN THE RESTART COMMAND.

6.3.5.2 EFFECT OF ADD COMMAND

THE UNITS SPECIFIED ARE ADDED TO THE TEST SEQUENCE. EACH  
UNIT MUST HAVE A P-TABLE IN MEMORY DUE TO AN EARLIER  
HARDWARE DIALOGUE. THIS COMMAND MUST BE FOLLOWED BY A  
RESTART OR CONTINUE. THE UNITS SWITCH MUST BE SPECIFIED.  
THE ADD COMMAND IS MEANINGFUL ONLY FOR UNITS THAT WERE  
PREVIOUSLY DROPPED.

6.3.6 DROP COMMAND

\*\*\*\*\*  
DRO(P)/UNITS:<UNIT-LIST>  
\*\*\*\*\*

6.3.6.1 UNITS SWITCH (/UNITS:<UNIT-LIST>)

<UNIT-LIST> IS AS IN THE RESTART COMMAND.

6.3.6.2 EFFECT OF DROP COMMAND

PROGRAM DOCUMENT

607  
608  
609  
610  
611  
612  
613  
614  
615  
616  
617  
618  
619  
620  
621  
622  
623  
624  
625  
626  
627  
628  
629  
630  
631  
632  
633  
634  
635  
636  
637  
638  
639  
640  
641  
642  
643  
644  
645  
646  
647  
648  
649  
650  
651  
652  
653  
654  
655  
656  
657  
658  
659  
660  
661

THE UNITS SPECIFIED WILL BE DROPPED FROM TESTING. THE UNITS WILL BE RESELECTED ONLY BY THE EXECUTION OF AN ADD OR START COMMAND. THE UNITS SWITCH MUST BE ENTERED. THIS COMMAND MUST BE FOLLOWED BY A RESTART OR A CONTINUE COMMAND.

6.3.7 PRINT COMMAND

\*\*\*\*\*  
PRI(NT)  
\*\*\*\*\*

6.3.7.1 EFFECT OF PRINT COMMAND

THE TOTAL NUMBER OF ERRORS FOR EACH UNIT SINCE THE LAST START OR RESTART COMMAND ARE PRINTED. THE ISR (INHIBIT STATISTICAL REPORTING) FLAG IS CLEARED.

6.3.8 DISPLAY COMMAND

\*\*\*\*\*  
DIS(PLAY)/UNITS:<UNIT-LIST>  
\*\*\*\*\*

6.3.8.1 UNITS SWITCH (/UNITS:<UNIT-LIST>)

<UNIT-LIST> IS AS IN THE RESTART COMMAND.

6.3.8.2 EFFECT OF DISPLAY COMMAND

THE HARDWARE P-TABLES FOR ALL UNITS UNDER TEST ARE PRINTED OUT IN THE FORMAT IN WHICH THEY WERE ENTERED. ANY UNITS THAT WERE DROPPED BY THE OPERATOR "DROP" COMMAND ARE SO DESIGNATED.

6.3.9 FLAGS COMMAND

\*\*\*\*\*  
FLA(GS)  
\*\*\*\*\*

6.3.9.1 EFFECT OF FLAGS COMMAND

THE CURRENT SETTINGS OF ALL FLAGS ARE PRINTED.

PROGRAM DOCUMENT

663  
664  
665  
666  
667  
668  
669  
670  
671  
672  
673  
674  
675  
676  
677  
678  
679  
680  
681  
682  
683  
684  
685  
686  
687  
688  
689  
690  
691  
692  
693  
694  
695  
696  
697  
698  
699  
700  
701  
702  
703  
704  
705  
706  
707  
708  
709  
710  
711  
712  
713  
714  
715  
716  
717

6.3.10 ZFLAGS COMMAND

\*\*\*\*\*  
ZFL(AGS)  
\*\*\*\*\*

6.3.10.1 EFFECT OF ZFLAGS COMMAND

ALL FLAGS ARE CLEARED.

6.3.11 CONTROL CHARACTERS

A CONTROL C (C) ENTERED DURING THE EXECUTION OF A DIAGNOSTIC CAUSES A RETURN TO COMMAND MODE.

A CONTROL Z (Z) ENTERED DURING ONE OF THE THREE OPERATOR DIALOGUES- INITIAL DIALOGUE (SEE 6.2),HARDWARE DIALOGUE (SEE 6.3.1.5), OR SOFTWARE DIALOGUE (SEE 6.3.1.5) CAUSES THE DEFAULTS TO BE TAKEN FOR THE REMAINDER OF THAT DIALOGUE.

A CONTROL O (O) ENTERED DURING THE EXECUTION OF A DIAGNOSTIC CAUSES ALL TELETYPE OUTPUT TO BE SURPRESSED FOR THE REMAINDER OF THE DIAGNOSTIC OR UNTIL ANOTHER O IS TYPED, WHICH RESTORES NORMAL TELETYPE OUTPUT.

6.3.12 HARDWARE PARAMETERS

THE FOLLOWING QUESTIONS WILL BE ASKED ON A START COMMAND. THE VALUE LOCATED TO THE LEFT OF THE QUESTION MARK IS THE DEFAULT VALUE THAT WILL BE TAKEN ON A CARRIAGE RETURN RESPONSE.

2. MICRO-CPU CSR ADDRESS: (O) 177000?

THIS IS THE ADDRESS AT WHICH THE CSR REGISTERS (SELO) RESIDE ON THE UNIBUS. THE ALLOWABLE RANGE IS 160000-177776 (OCTAL), AND THE DEFAULT IS 177000.

3. MICRO CPU VECTOR ADDRESS: (O) 300?

THE ALLOWABLE RANGE IS 300-770,AND DEFAULT VALUE IS 300

PROGRAM DOCUMENT

719  
720  
721  
722  
723  
724  
725  
726  
727  
728  
729  
730  
731  
732  
733  
734  
735  
736  
737  
738  
739  
740  
741  
742  
743  
744  
745  
746  
747  
748  
749  
750  
751  
752  
753  
754  
755  
756  
757  
758  
759  
760  
761  
762  
763  
764  
765  
766  
767  
768  
769  
770  
771  
772  
773  
774  
775

4. MICRO CPU PRIORITY LEVEL: (4) ??

DEFFAULT VALYE IS 4

NOTE:

M7501 MODULE MOUNTED WITH DC003 CHIPS CAN ONLY  
INTERUPT ON LEVEL 4

6.3.13 SOFTWARE PARAMETERS

NO SOFTWARE PARAMETER QUESTIONS ARE ASKED BY PART 2 OF THE  
STATIC LOGIC TESTS.

6.3.14 EXTENDED DISCUSSION OF P-TABLE DIALOGUE

THE FULL CAPABILITY OF THE HARDWARE DIALOGUE IS REVEALED BY  
THE FOLLOWING DISCUSSION OF WHAT HAPPENS INTERNALLY.

AS SOON AS THE QUESTION "# UNITS?" IS ANSWERED (WITH THE  
NUMBER N, SAY) SPACE IN CORE IS ALLOCATED FOR N P-TABLES.  
ALL OF THE P-TABLES ARE OF THE SAME FORMAT, AND THERE IS A  
ONE-TO ONE CORRESPONDENCE BETWEEN THE HARDWARE PARAMETER  
QUESTIONS AND THE SLOTS IN THE P-TABLE FORMAT.

ON THE FIRST TRIP THRU THE QUESTIONS, ALL OF THE SLOTS IN  
ALL OF THE P-TABLES ARE FILLED. IF THE OPERATOR TYPES IN  
LESS THAN N EXPLICIT VALUES IN RESPONSE TO A PARTICULAR  
QUESTION, THESE VALUES ARE PLACED IN THE P-TABLES (ONE VALUE  
GOING INTO THE PROPER SLOT OF EACH P-TABLE BEGINNING WITH  
THE FIRST P-TABLE) UNTIL THE STRING OF VALUES IS EXHAUSTED.  
THE LAST VALUE IN THE STRING BECOMES THE NEW DEFAULT AND IS  
USED TO FILL THAT SLOT IN THE REMAINING P-TABLES.

ON SUBSEQUENT TRIPS THRU THE QUESTIONS, THE SAME PROCESS IS  
CARRIED OUT, EXCEPT THAT THE EARLIEST P-TABLE NOT TO HAVE  
RECEIVED AN EXPLICIT VALUE IN ANY OF ITS SLOTS NOW ASSUMES  
THE ROLE THAT TABLE NUMBER ONE PLAYED IN THE FIRST TRIP.

THE SERIES OF QUESTIONS IS REISSUED UNTIL AT LEAST ONE  
QUESTION HAS RECEIVED N EXPLICIT VALUES FROM THE OPERATOR.

IN GIVING A STRING OF VALUES, COMMAS WITHOUT INTERVENING  
VALUES MAY BE USED TO INDICATE A REPETITION OF THE LAST  
NAMED VALUE.

A STRING OF VALUES MAY BE GIVEN AS A RANGE (6-10 FOR  
EXAMPLE). IF THE VALUES REPRESENT PURE NUMERICAL DATA, THIS  
SAMPLE RANGE TRANSLATES TO THE STRING 6,7,8,9,10 (AN  
INCREMENT OF 1). IF THE VALUES ARE ADDRESSES, THE SAMPLE  
RANGE TRANSLATES TO THE STRING 6,8,10 (AN INCREMENT OF 2).



## PROGRAM DOCUMENT

777  
778  
779  
780  
781  
782  
783  
784  
785  
786  
787  
788  
789  
790  
791  
792  
793  
794  
795  
796  
797  
798  
799  
800  
801  
802  
803  
804  
805  
806  
807  
808  
809  
810  
811  
812  
813  
814  
815  
816  
817  
818  
819  
820  
821  
822  
823  
824  
825

NOW LET US SEE HOW WE COULD USE THESE CAPABILITIES TO CONSTRUCT A SET OF P-TABLES. ASSUME THAT WE HAVE 16 UNITS, AND THAT THERE ARE THREE HARDWARE PARAMETERS FOR EACH (THREE SLOTS IN THE P-TABLE, THREE HARDWARE QUESTIONS IN THE DIALOGUE). LET THE DESIRED VALUE FOR THE FIRST PARAMETER BE THE NUMBER 75 FOR ALL 16 TABLES. LET THE DESIRED VALUE FOR THE SECOND PARAMETER BE EQUAL TO THE UNIT NUMBER (0,1,2,...,15) EXCEPT FOR UNIT 12, WHICH SHOULD RECEIVE THE VALUE 11. LET THE DESIRED VALUE FOR THE THIRD PARAMETER BE THE NUMBER 76 FOR THE FIRST 7 UNITS AND THE NUMBER 77 FOR THE LAST 9 UNITS.

THE FOLLOWING DIALOGUE WOULD ACCOMPLISH THIS GOAL:

0 UNITS (D) ? 16

UNIT 1

<QUESTION 1> ? 75  
<QUESTION 2> ? 0-6  
<QUESTION 3> ? 76

UNIT 21

<QUESTION 1> ?  
<QUESTION 2> ? 7-11..13-15  
<QUESTION 3> ? 77

THE FIRST TIME THE SERIES IS ASKED, SLOT ONE RECEIVES A 75 IN ALL 16 TABLES. SLOT TWO RECEIVES THE VALUES 0,1,2,...,6 IN TABLES 0 THRU 6 AND A CONSTANT 6 IN TABLES 7 THRU 15. SLOT THREE RECEIVES A CONSTANT 76 IN ALL 16 TABLES.

THE SECOND TIME THRU THE SERIES, TABLES 16 THRU THE END ARE GOING TO BE AFFECTED (NOTE THAT THIS PIECE OF INFORMATION IS PRINTED OUT FOR THE OPERATOR IN THE FORM "UNIT XX" AT THE BEGINNING OF EACH SERIES). QUESTION 1 IS RESPONDED TO BY A <CR>, SO SLOT ONE STAYS AT CONSTANT 75 IN TABLES 7 THRU 15, SINCE NO NEW EXPLICIT VALUES ARE TYPED IN. SLOT TWO GETS THE VALUES 7,8,9,10,11 IN TABLES 7 THRU 11, AND GETS A 11 IN SLOT 12, AND GETS THE VALUES 13,14,15 IN TABLES 13 THRU 15. SLOT THREE GETS THE VALUE 77 IN TABLES 7 THRU 15.

THE DIALOGUE IS TERMINATED WHEN THE SOFTWARE RECOGNIZES THAT 16 EXPLICIT VALUES HAVE BEEN GIVEN FOR AT LEAST ONE QUESTION (NAMELY QUESTION 2).

PROGRAM DOCUMENT

827  
828  
829  
830  
831  
832  
833  
834  
835  
836  
837  
838  
839  
840  
841  
842  
843  
844  
845  
846  
847  
848  
849  
850  
851  
852  
853  
854  
855  
856  
857  
858  
859  
860  
861  
862  
863  
864  
865  
866  
867  
868  
869  
870  
871  
872  
873  
874  
875  
876  
877  
878  
879  
880  
881  
882  
883

7.0 TEST DESCRIPTIONS

\*\*\*\*\* TEST 1 \*\*\*\*\*  
\*VERIFY THAT REFERENCED QBUS DEVICE REGISTERS  
\*DO NOT CAUSE TIME OUT TRAP  
\*\*\*\*\*

\*\*\*\*\* TEST 2 \*\*\*\*\*  
\*  
\*CHECK PROM REVISION COMPATIBILITY  
\*  
\*\*\*\*\*

\*\*\*\*\* TEST 3 \*\*\*\*\*  
\*  
\*KMV11 REAL TIME CLOCK TEST  
\*  
\*\*\*\*\*

\*\*\*\*\* TEST 4 \*\*\*\*\*  
\*  
\*BAUD RATE GENERATOR TEST  
\*  
\*\*\*\*\*

\*\*\*\*\* TEST 5 \*\*\*\*\*  
\*  
\*TRANSMIT AND RECEIVE FRAMES IN INTERNAL  
\*LOOPBACK MODE WITHOUT INTERRUPTIONS ON CHANEL A.  
\*  
\*\*\*\*\*

\*\*\*\*\* TEST 6 \*\*\*\*\*  
\*  
\*TRANSMIT AND RECEIVE FRAMES IN INTERNAL  
\*LOOPBACK MODE WITHOUT INTERRUPTIONS ON CHANEL B.  
\*  
\*\*\*\*\*

\*\*\*\*\* TEST 7 \*\*\*\*\*  
\*  
\*TRANSMIT AND RECEIVE FRAMES AT DIFFERENT SPEEDS IN  
\*INTERNAL LOOPBACK ON CHANEL A WITH INTERRUPTS.  
\*\*\*\*\*

PROGRAM DOCUMENT

884  
885  
886  
887  
888  
889  
890  
891  
892  
893  
894  
895  
896  
897  
898  
899  
900  
901  
902  
903  
904  
905  
906  
907  
908  
909  
910  
911  
912  
913  
914  
915  
916  
917  
918  
919  
920  
921  
922  
923  
924  
925  
926  
927  
928  
929  
930  
931  
932  
933  
934  
935  
936  
937  
938  
939  
940

\*  
\*\*\*\*\*

\*\*\*\*\* TEST 8 \*\*\*\*\*

\*  
\*TRANSMIT AND RECEIVE FRAMES AT DIFFERENT SPEEDS IN  
\*INTERNAL LOOPBACK ON CHANEL B WITH INTERRUPTS

\*  
\*\*\*\*\*

NOTE: THE REMAINING TESTS REQUIRE EXTERNAL LOOPBACK  
CONNECTORS.

\*\*\*\*\* TEST 9 \*\*\*\*\*

\*  
\*TRANSMIT FRAMES IN EXTERNAL LOOP BACK ON CHANEL A  
\*(LOOPBACK CONNECTOR INSTALLED)

\*  
\*\*\*\*\*

\*\*\*\*\* TEST 10 \*\*\*\*\*

\*  
\*TRANSMIT FRAMES IN EXTERNAL LOOP BACK ON CHANEL B  
\*(LOOPBACK CONNECTOR INSTALLED)

\*  
\*\*\*\*\*

\*\*\*\*\* TEST 11 \*\*\*\*\*

\*  
\*TEST MODEM SIGNAL CCITT 107 AND CCITT 108 ON  
\*CHANEL A WITH EXTERNAL LOOPBACK  
\*(LOOP BACK CONNECTOR INSTALLED)

\*  
\*TEST MODEM SIGNAL CCITT 107 AND CCITT 108 ON  
\*CHANEL B WITH EXTERNAL LOOPBACK  
\*(LOOP BACK CONNECTOR INSTALLED)

\*  
\*\*\*\*\*

\*\*\*\*\* TEST 12 \*\*\*\*\*

\*  
\*TEST MODEM SIGNAL CCITT 105,106,109 ON CHANEL A

PROGRAM DOCUMENT

941  
942  
943  
944  
945  
946  
947  
948  
949  
950  
951

\* WITH EXTERNAL LOOPBACK  
\*(LOOP BACK CONNECTOR INSTALLED)  
\*  
\*TEST MODEM SIGNAL CCITT 105,106,109 ON CHANEL B  
\* WITH EXTERNAL LOOP BACK  
\*(LOOP BACK CONNECTOR INSTALLED)  
\*  
\*\*\*\*\*

PROGRAM DOCUMENT

953  
954  
955  
956  
957  
958  
959  
960  
961  
962  
963  
964  
965  
966  
967  
968  
969  
970  
971  
972  
973  
974  
975  
976  
977  
978  
979  
980  
981  
982  
983  
984  
985  
986

8.0 ERROR INFORMATION

8.1 ERROR REPORTING

ERRORS ARE REPORTED BY THE PROGRAM AS THEY OCCUR (IF NOT INHIBITED). THE REPORT CONFORMS TO THE DIAGNOSTIC SUPERVISOR ERROR REPORT FORMAT, AND CONSISTS OF A DESCRIPTION OF THE ERROR, THE TEST NUMBER, SUBTEST NUMBER, PC OF THE ERROR CALL, DEVICE ADDRESS, AND BASIC AND EXTENDED ERROR INFORMATION.

9.0 HISTORY

- DESIGN STARTED ON JANUARY 82
- REV A0 ON DECEMBER 82 ;DIAGNOSTIC REVIEW
- REV B0 ON APRIL 83 ;WRONG CLOCK DIVIDER VALUE IN TWO TEST
- CVKMEBO => CNKMEAO ON JULY 84 ;CONVERT TO RUN UNDER FALCON \*

PROGRAM DOCUMENT

```

988          .TITLE KMV11 B LINE CNT DIAG.
996          002000          . =2000
997
998
999
1000
1001
1002
1003          .MCALL  SVC
1004 002000          SVC          ; INITIALIZE SUPERVISOR MACROS
1005
1006
1007
1008
1009
1010 002000          BGNMOD  KMV11B
1011
1012
1013          000000          $LSTIN= 0
1014          000000          $LSTTAG= 0
1015          177777          SVCINS= -1      ; LIST INSTRUCTIONS, SHIFTED RIGHT
1016          177777          SVCTST= -1     ; LIST TEST TAGS, SHIFTED RIGHT
1017          177777          SVCSUB= -1     ; LIST SUBTEST TAGS, SHIFTED RIGHT
1018          177777          SVCGBL= -1    ; LIST GLOBAL TAGS, SHIFTED RIGHT
1019          177777          SVCTAG= -1    ; LIST OTHER TAGS, SHIFTED RIGHT
1020
1021          ; CHANGE THE VALUES OF THE SVC... SYMBOLS TO BE ZERO IF YOU WISH
1022          ; TO ALIGN THE MACRO CALLS AND THEIR EXPANSIONS. CHANGE THE
1023          ; SYMBOLS TO BE MINUS-ONE TO NOT LIST THE EXPANSIONS. YOU MAY
1024          ; CHANGE THE SYMBOLS AT ANY POINT IN YOUR PROGRAM.
1025
1026

```

PROGRAM HEADER

```
1028      .SBTTL  PROGRAM HEADER
1029      :**
1030      : THE PROGRAM HEADER IS THE INTERFACE BETWEEN
1031      : THE DIAGNOSTIC PROGRAM AND THE SUPERVISOR.
1032      :--
1033
1034 002000      POINTER BGNSW,BGNDU,BGNSETUP
1035
1036
1037
1055
1056 002000      HEADER  NKMEA0,B,0,240.,0
1057
1058
1069
```

## PROGRAM HEADER

```
1071
1072
1073      ;**
1074      ; THIS TABLE IS USED BY THE RUNTIME SERVICES
1075      ; TO PROTECT THE LOAD MEDIA.
1076      ;--
1077      002122      BGNPROT
1078
1079      002122      000000      0      ;OFFSET INTO P-TABLE FOR CSR ADDRESS
1080      002124      177777      -1     ;OFFSET INTO P-TABLE FOR MASSBUS ADDRESS
1081      002126      177777      -1     ;OFFSET INTO P-TABLE FOR DRIVE NUMBER
1082
1083
1097
1098
1099      002130      ENDPROT
1100
```



DISPATCH TABLE

1102  
 1103  
 1104  
 1105  
 1106  
 1107  
 1108  
 1109 002130  
 1110  
 1117  
 1118  
 1119  
 1120  
 1121

.SBTTL DISPATCH TABLE

;/////////////////
 ;/ THE DISPATCH TABLE CONTAINS THE STARTING ADDRESS OF EACH TEST.
 ;/ IT IS USED BY THE SUPERVISOR TO DISPATCH TO EACH TEST.
 ;/////////////////

DISPATCH 12

DEFAULT HARDWARE P-TABLE

1123  
 1124  
 1125  
 1126  
 1127  
 1128  
 1129  
 1130  
 1131  
 1132  
 1133 002162  
 1134  
 1144  
 1145  
 1146 002164 177000  
 1147 002166 000300  
 1148 002170 004000  
 1149 002172 000001  
 1150 002174  
 1151  
 1152

.SBTTL DEFAULT HARDWARE P-TABLE

```

:////////////////////
:/ THE DEFAULT HARDWARE P-TABLE CONTAINS DEFAULT VALUES OF
:/ THE TEST-DEVICE PARAMETERS. THE STRUCTURE OF THIS TABLE
:/ IS IDENTICAL TO THE STRUCTURE OF THE RUN-TIME P-TABLE.
:/ AND IS USED AS A " TEMPLATE" FOR BUILDING THE P-TABLE
:////////////////////

```

```

.ENABL  AMA      DFPTBL
        BGNHW

```

```

        .WORD 177000      ;KMV11,CSRS ADDRESS
        .WORD  300       ;KMV11, VECTOR ADDRESS
        .WORD 4000       ;INTERRUPT PRIORITY LEVEL
        .WORD  1
        ENDDHW

```

DEFAULT HARDWARE P-TABLE

1154  
1155  
1156  
1157  
1158  
1159  
1160  
1161  
1162  
1163  
1164  
1174  
1175  
1190  
1191 002174

.SBTTL GLOBAL EQUATES SECTION

:/  
:/ THE GLOBAL EQUATES SECTION CONTAINS PROGRAM EQUATES THAT  
:/ ARE USED IN MORE THAN ONE TEST.  
:/

EQUALS

; BIT DIFINITIONS

100000	BIT15== 100000
040000	BIT14== 40000
020000	BIT13== 20000
010000	BIT12== 10000
004000	BIT11== 4000
002000	BIT10== 2000
001000	BIT09== 1000
000400	BIT08== 400
000200	BIT07== 200
000100	BIT06== 100
000040	BIT05== 40
000020	BIT04== 20
000010	BIT03== 10
000004	BIT02== 4
000002	BIT01== 2
000001	BIT00== 1

001000	BIT9== BIT09
000400	BIT8== BIT08
000200	BIT7== BIT07
000100	BIT6== BIT06
000040	BIT5== BIT05
000020	BIT4== BIT04
000010	BIT3== BIT03
000004	BIT2== BIT02
000002	BIT1== BIT01
000001	BIT0== BIT00

; EVENT FLAG DEFINITIONS  
; EF32:EF17 RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION

000040	EF.START== 32.	; BIT POSITION IN SECOND STATUS WORD
000037	EF.RESTART== 31.	; (100000) START COMMAND WAS ISSUED
000036	EF.CON;INUE== 30.	; (040000) RESTART COMMAND WAS ISSUED
000035	EF.NEW== 29.	; (020000) CONTINUE COMMAND WAS ISSUED
000034	EF.PWR== 28.	; (010000) A NEW PASS HAS BEEN STARTED
		; (004000) A POWER-FAIL/POWER-UP OCCURRED

GLOBAL EQUATES SECTION

; PRIORITY LEVEL DEFINITIONS

```

000340
000300
000240
000200
000140
000100
000040
000000

```

```

;
PRI07== 340
PRI06== 300
PRI05== 240
PRI04== 200
PRI03== 140
PRI02== 100
PRI01== 40
PRI00== 0

```

; OPERATOR FLAG BITS

```

000004
000010
000020
000040
000100
000200
000400
001000
002000
004000
010000
020000
040000
100000

```

```

;
EVL== 4
LOT== 10
ADR== 20
IDU== 40
ISR== 100
UAM== 200
BOF== 400
PNT== 1000
PRI== 2000
IXE== 4000
IBE== 10000
IER== 20000
LOE== 40000
HOE== 100000

```

```

1192
1193
1194
1195
1196
1197
1198
1199
1200
1201
1202
1203
1204
1205
1206
1207
1208
1209
1210
1211
1212
1213
1214
1215
1216
1217

```

```

000300
054000
044000
040000
052525
125252
013224
070154
000174
000146
000143
000141

```

```

;MAXPRI==340
MAXPRI==300
MAINT0==54000
MAINT1==44000
MCLR==40000
DATA1== 052525
DATA2== 125252
KB1.2== 5780.
KB64== 108.
KB56== 124.
KB68== 102.
KB70== 99.
KB72== 97.

```

```

;JB REV A-0 CNKME
;JB REV A-0 CNKME

```

```

;MASTER CLEAR = 1,MODE = 1 ,MAINT 1 = 1 .T11=HOLD
;MASTER CLEAR = 1,MODE = 0 ,MAINT 1 = 0 .T11=NOT HOLD

```

; OCTAL VALUE OF 1.2 KBAUDS

```

; " " " 64 "
; " " " 56 "
; " " " 68 "
; " " " 70 "
; " " " 72 "

```

DIVIDER CALCULATION= DECIMAL VALUE=6912 / X KBAUDS

```

;*****
;* PROGRAM EVENT FLAG DEFINITIONS
;*****

```

GLOBAL DATA SECTION

1219  
 1220  
 1221  
 1222  
 1223  
 1224  
 1225  
 1231  
 1232  
 1233  
 1234  
 1235  
 1236 002174  
 1237  
 1238  
 1239  
 1252  
 1253 002222  
 002222 000000  
 002224 000000  
 002226 000000  
 002230 000000  
 1254  
 1255  
 1256  
 1257  
 1258  
 1259  
 1260  
 1261 002232 000000  
 1262 002234 000005  
 1263 002236 000000  
 1264 002240 000000  
 1265 002242 000000  
 1266 002244 000000  
 1267 002246 000000  
 1268 002250 000000  
 1269 002252 000000  
 1270 002254 000000  
 1271 002256 000000  
 1272 002260 000000  
 1273 002262 000015  
 1274 002264 000000

.SBTTL GLOBAL DATA SECTION

```

;////////////////////////////////////
; THE GLOBAL DATA SECTION CONTAINS DATA THAT ARE USED
; IN MORE THAN ONE TEST.
;////////////////////////////////////

```

```

;*****
;* STORAGE FOR DEVICE REGISTERS
;*****
DESCRIPT <KMV11B LINE CNT DIAG.>

```

```

ERRTBL
ERRTYP: .WORD 0
ERRNBR: .WORD 0
ERRMSG: .WORD 0
ERRBLK: .WORD 0

```

```

;*****
;* PROGRAM CONTROL PARAMETERS
;*****
LOCK: .WORD 0 ;ADDRESS FOR LOCK CURRENT DATA
MAXERR: .WORD 5 ;MAX ERROR BEFORE DROPPING UNIT
ERRCNT: .WORD 0 ;ERROR COUNT
LOGDEV: .WORD 0 ;LOGICAL DEVICE NUMBER
PSTACK: .WORD 0 ;BASE LEVEL PROGRAM STACK POINTER
SAVSP: .WORD 0 ;STACK POINTER STORAGE
SAVPC: .WORD 0 ;PROGRAM COUNTER STORAGE
FLAG: .WORD 0 ;SCRATCH STORAGE
FTIME: .WORD 0
SAVE4: .WORD 0
SAVE6: .WORD 0
L$SW: .WORD 0
L$UIT: .WORD 15
UNIT: .WORD 0

```

GLOBAL DATA SECTION

```

1276 ;*****
1277 ;* MISCELLANEOUS STORAGE
1278 ;*****
1279
1280 002266 000000 DELCT1: .WORD 0
1281 002270 000000 DELCT2: .WORD 0
1282 002272 000000 GOOD: .WORD 0
1283 002274 000000 GOOD0: .WORD 0
1284 002276 000000 GOOD1: .WORD 0
1285 002300 000000 GOOD2: .WORD 0
1286 002302 000000 GOOD4: .WORD 0
1287 002304 000000 GOOD6: .WORD 0
1288 002306 000000 GOOD10: .WORD 0
1289 002310 000000 GOOD12: .WORD 0
1290 002312 000000 GOOD14: .WORD 0
1291 002314 000000 GOOD16: .WORD 0
1292 002316 000000 SELO: .WORD 0
1293 002320 000000 SEL1: .WORD 0
1294 002322 000000 SEL2: .WORD 0
1295 002324 000000 SEL4: .WORD 0
1296 002326 000000 SEL6: .WORD 0
1297 002330 000000 SEL10: .WORD 0
1298 002332 000000 SEL12: .WORD 0
1299 002334 000000 SEL14: .WORD 0
1300 002336 000000 SEL16: .WORD 0
1301 002340 000000 BSEL1: .WORD 0
1302 002342 000000 RANST: .WORD 0
1303 002344 000000 RANSEL: .WORD 0
1304 002346 000000 RANMTA: .WORD 0
1305 002350 000000 RANDN: .WORD 0
1306 002352 000000 SAVPC1: .WORD 0
1307 002354 000000 SAVSTA: .WORD 0
1308 002356 000000 COUNT: .WORD 0
1309 002360 000000 NUMBER: .WORD 0
1310 002362 000000 ADDR: .WORD 0
1311 002364 000000 GDDAT: .WORD 0
1312 002366 000000 BDDAT: .WORD 0
1313
1314 002370 TTABLE: .BLKW 2000
1315 006370 RTABLE: .BLKW 2000
1316
1317 012370 000000 EXADDR: .WORD 0
1318 012372 000000 INTFLG: .WORD 0
1319 012374 000000 BAD: .WORD 0
1320 012376 000000 BSELO: .WORD 0
1321 012400 000000 DATA: .WORD 0
1322 012402 000000 VECT: .WORD 0
1323
1324
1325 012404 000000 KIND: .WORD 0
1326 012406 000000 CHANEL: .WORD 0
1327
1328 012410 000000 TXDATA: .WORD 0
1329 012412 000000 RXDATA: .WORD 0
1330 012414 000000 TSPEED: .WORD 0
1331 012416 000000 LENGTH: .WORD 0
1332 012420 000000 NUB: .WORD 0

```

;=0 IF KMV11A .-1 IF KMV11B

E3

GLOBAL DATA SECTION

1333	012422	000000	RXCNT:	.WORD	0
1334	012424	000000	STAER?:	.WORD	0
1335	012426	000000	WRDCNT:	.WORD	0

GLOBAL DATA SECTION

1337  
1338  
1339  
1340  
1341  
1342  
1343  
1344  
1345  
1346  
1347  
1348  
1349  
1350  
1351  
1352  
1353  
1354  
1355  
1356  
1357

```
*****  
:LOAD IN LOCATION "GDREV" THE PROM VERSION NUMBER THAT IS *  
:COMPATIBLE WITH THIS DIAGNOSTIC *  
:  
:EACH PROM CONTAIN A REV LEVEL AND A ECO LEVEL: *  
:THE REV LEVEL IS MODIFIED EACH TIME A MODIFICATION IS DONE *  
:THE ECO LEVEL IS MODIFIED WHEN THE PROM MODIFICATION NEED *  
:A DIAGNOSTIC MODIFICATION *  
*****
```

012430 000001

GDREV: .WORD 1



## GLOBAL DATA SECTION

```

1359 ;*****
1360 ;* PROGRAM CONTROL FLAGS
1361 ;*****
1362 012432 000 INIFLG: .BYTE 0 ;PROGRAM INITIALIZING FLAG
1363 .EVEN
1364 012434 000 LOKFLG: .BYTE 0 ;LOCK ON CURRENT TEST FLAG
1365 012435 000 QV.FLG: .BYTE 0 ;QUICK VERIFY FLAG
1366 .EVEN
1367 012436 000000 UUT: .WORD 0 ;CURRENT UNIT UNDER TEST
1368
1369
1370
1371
1372
1373 ;*****
1374 ;* POINTERS TO KMV11 VECTORS AND REGISTERS
1375 ;*****
1376 012440 000000 KMVV00: 0 ;POINTER TO KMV11 INTRPT VECTOR 0
1377 012442 000000 KMVLVL: 0 ;POINTER TO KMV11 INTRPT SERVICE
1378 012444 000000 KMVV04: 0 ;POINTER TO KMV11 INTRPT VECTOR 04
1379 012446 000000 KMVV02: 0 ; " " " " 02
1380 012450 000000 KMVV06: 0 ; " " " " 06
1381 012452 000000 KMTLVL: 0 ;POINTER TO KMV11 TX INTRPT SERVICE PS
1382 012454 000000 KMVCSR: 0 ;POINTER TO KMV11 CONTROL STATUS REGISTER
1383 012456 000000 KMVP02: 0 ;POINTER TO KMV11 PORT REGISTER - SEL2
1384 012460 000000 KMVP04: 0 ;POINTER TO KMV11 PORT REGISTER - SEL4
1385 012462 000000 KMVP06: 0 ;POINTER TO KMV11 PORT REGISTER - SEL6
1386
1387 012464 000000 KMVP10: 0 ;POINTER TO KMV11 PORT REG -SEL10
1388 012466 000000 KMVP12: 0 ;POINTER TO PORT REG -SEL 14
1389 012470 000000 KMVP14: 0 ;POINTER TO PORT REG -SEL14
1390 012472 000000 KMVP16: 0 ;POINTER TO PORT REG 16
1391
1392 012474 000000 LOOP: 0 ;POINTER TO LOOP BACK CONNECTOR
1393
1394
1395 ;:**** PRIMARY REG ADRS STORAGE FOR THIS UNIT ****
1396 ;THESE LOCATIONS WILL BE LOADED FOR THE CURRENT UNIT, IN INIT CODE
1397 012476 REGADR:
1398
1399 ;:**** STACK USED FOR SUBROUTINE LINKAGE ****
1400 012476 .BLKW 100
1401 012676 SSTACK:
1402
1403
1404
1405
1406
1407
1408

```

GLOBAL TEXT SECTION

1410  
1411  
1412  
1413  
1414  
1415  
1416  
1417  
1418  
1419  
1420  
1421 012676  
1422  
1423  
1424  
1425  
1426  
1427  
1434  
1435  
1436  
1437  
1438

```

.SBTTL GLOBAL TEXT SECTION
;*****
; THE GLOBAL TEXT SECTION CONTAINS FORMAT STATEMENTS,
; MESSAGES, AND ASCII INFORMATION THAT ARE USED IN
; MORE THAN ONE TEST.
;*****
;*****
;* NAMES OF DEVICES SUPPORTED BY PROGRAM
;*****
;          DEVTYP <KMV11B>

;
; FORMAT STATEMENTS USED IN PRINT CALLS
;

```

GLOBAL SUBROUTINES

1440  
1441  
1442  
1443  
1444  
1445  
1446  
1447  
1448  
1449  
1450  
1451  
1452  
1453

.SBTTL GLOBAL SUBROUTINES

-----  
: MACRO'S NEEDED TO CALL SUBROUTINES  
-----

.MACRO CLRMAR  
ROMCLK  
004000  
.ENDM CLRMAR

GLOBAL SUBROUTINES

```

1455           ;ROUTINE TO WAIT FOR EVENT OR TIMEOUT
1456
1457
1458
1459           ;CALLING SEQUENCE:      JSR   PC,WAIT1
1460           ;                      JSR   PC,WAIT2
1461
1462
1463           ;INPUTS PARAMETERS:      DELCT1,DELCT2
1464
1465
1466           ;                      INC DELCT1 UNTIL 0
1467           ;                      DEC DELCT2 UNTIL 0      DELCT2= NUMB OF WAIT1 PASSES
1468
1469
1470
1471
1472
1473
1474
1475 012706 005237 002266      WAIT2:  INC   DELCT1
1476 012712 001375           BNE   WAIT2
1477
1478 012714           BREAK
1479
1480 012716 005337 002270      DEC   DELCT2
1481 012722 001371           BNE   WAIT2
1482
1483 012724 000207           RTS    PC
1484
1485
1486
1487
1488
1489
1490 012726 005237 002266      WAIT1:  INC   DELCT1
1491 012732 001375           BNE   WAIT1
1492 012734           BREAK
1493
1494 012736 000207           RTS    PC

```

GLOBAL SUBROUTINES

```

1496           ;MACRO TO WAIT A FEW MS
1497
1498           ;CALLING SEQUENCE:      WAITA  X           0<X<177777
1499           ;                      WAITB  X,Y        0<X OR Y<177777
1500
1501
1502
1503           .MACRO  WAITA  X
1504                 MOV   #X,DELCT1
1505                 JSR   PC,WAIT1
1506           .ENDM
1507
1508
1509
1510
1511
1512
1513
1514
1515           .MACRO  WAITB  X,Y
1516                 MOV   #X,DELCT1
1517                 MOV   #Y,DELCT2
1518                 JSR   PC,WAIT2
1519           .ENDM
1520
1521

```

;LOAD COUNT  
;WAIT



## GLOBAL SUBROUTINES

```

1570          ;ROUTINE TO CHECK REGISTER BSELO AND TO REPORT ERROR
1571
1572
1573
1574
1575
1576
1577          ;CALLING SEQUENCE:      JSR      PC,TSTERR
1578
1579
1580
1581          ;OUTPUT PARAMETERS:      RETURN TO      PC      IF TEST IS OK
1582          ;                        :              PC+2    IF TIMEOUT DURING TEST
1583          ;                        :              PC+4    IF NO KMV11 ANSWER
1584          ;                        :              PC+6    IF DATA CMP ERROR
1585
1586
1587
1588
1589
1590
1591 013102 004537 013652      TSTERR: JSR      R5,CBSELO      ;LOOK IF BSELO=0
1592 013106 000000              .WORD      0
1593 013110 000411              BR        1$          ;TEST IS OK ,RTS PC
1594
1595
1596 013112 004537 013652              JSR      R5,CBSELO      ;LOOK IF BSELO=200
1597 013116 000200              .WORD      200
1598 013120 000406              BR        2$          ;TIMEOUT DURING TEST,RTS PC+2
1599
1600
1601 013122 004537 013652              JSR      R5,CBSELO      ;LOOK IF BSELO=100
1602 013126 000100              .WORD      100
1603 013130 000405              BR        3$          ;DATA CMP ERROR,RTS PC+6
1604
1605
1606
1607 013132 000407              BR        4$          ;NO KMV11 ANSWER ,RTS PC+4
1608
1609
1610
1611 013134 000207              1$:      RTS      PC          ;TEST OK
1612
1613
1614 013136 062716 000002              2$:      ADD      #2,(SP)
1615 013142 000207              RTS      PC          ;TIMEOUT ERROR
1616
1617
1618 013144 062716 000006              3$:      ADD      #6,(SP)
1619 013150 000207              RTS      PC          ;DATA CMP ERROR
1620
1621
1622 013152 062716 000004              4$:      ADD      #4,(SP)
1623 013156 000207              RTS      PC          ;NO KMV11 ANSWER

```

## NUMBER GENERATOR

.SBTTL NUMBER GENERATOR

## DESCRIPTION:

ROUTINE TO GENERATE DATA PATTERNS,  
THE TYPE OF PATTERN IS SELECTED BY R3, AND THE  
PATTERN GENERATED IS RETURNED IN LOCATION "DATA"  
AND LOCATION "GOOD"

## CALLING SEQUENCE:

JSR PC,GENER

## INPUT PARAMETERS:

R3 CONTAINS THE PATTERN NUMBER

R3=0 ALL ZEROES  
1 ALL ONES  
2 010101 ETC BIT PATTERN  
3 101010 ETC BIT PATTERN  
4 ROTATING 1 IN A ZERO WORD  
5 ROTATING 0 IN AN ALL ONE WORD  
6 PSEUDO RANDOM NUMBER  
7 INCREMENTING DATA PATTERN, GOOD  
CONTAINS THE VALUE TO BE UPDATED

## IMPLICIT INPUT PARAMETERS:

NONE

## OUTPUT PARAMETERS:

THE NUMBER GENERATED IS HELD IN  
DATA AND GOOD.

## IMPLICIT OUTPUT PARAMETERS:

NONE

## COMPLETION CODES:

NONE

## POSSIBLE ERROR CODES:

NONE

1625  
1626  
1627  
1628  
1629  
1630  
1631  
1632  
1633  
1634  
1635  
1636  
1637  
1638  
1639  
1640  
1641  
1642  
1643  
1644  
1645  
1646  
1647  
1648  
1649  
1650  
1651  
1652  
1653  
1654  
1655  
1656  
1657  
1658  
1659  
1660  
1661  
1662  
1663  
1664  
1665  
1666  
1667  
1668  
1669  
1670  
1671  
1672  
1673  
1674  
1675  
1676  
1677  
1678  
1679  
1680  
1681



NUMBER GENERATOR

```

1682
1683
1684 013160 042703 177770
1685 013164 004737 013460
1686 013170 006303
1687 013172 000173 013176
1688 013176 013216
1689 013200 013222
1690 013202 013230
1691 013204 013236
1692 013206 013244
1693 013210 013254
1694 013212 013312
1695 013214 013432
1696 013216 005000
1697 013220 000507
1698 013222 005000
1699 013224 005100
1700 013226 000504
1701 013230 012700 052525
1702 013234 000501
1703 013236 012700 125252
1704 013242 000476
1705 013244 000241
1706 013246 004737 013266
1707 013252 000472
1708 013254 000241
1709 013256 004737 013266
1710 013262 005100
1711 013264 000465
1712 013266 006037 013310
1713 013272 001003
1714 013274 012737 100000 013310
1715 013302 013700 013310
1716 013306 000207
1717 013310 000001
1718 013312 012737 000005 002344
1719 013320 004737 013332
1720 013324 013700 002350
1721 013330 000443
1722 013332 013702 002350
1723 013336 001002
1724 013340 013702 002342
1725 013344 032737 000777 002344
1726 013352 001003
1727 013354 012737 000001 002344
1728 013362 013703 002344
1729 013366 013702 002350
1730 013372 033702 002346
1731 013376 001405
1732 013400 005102
1733 013402 033702 002346
1734 013406 001401
1735 013410 000402
1736 013412 000241
1737 013414 000401
1738 013416 000261

;
;
GENER: BIC #177770,R3
        JSR PC,SAVREG
        ASL R3
        JMP @GENSEL(R3)
GENSEL: GEN0 ;ALL ZERO WORD
        GEN1 ;ALL ONE WORD
        GEN52 ;52 PATTERN
        GEN25 ;25 PATTERN
        GENR1 ;ROTATE '1' EACH CALL
        GENRO ;ROTATE '0' EACH CALL
        GENRAN ;RANDOM NUMBER
        GENINC ;INCREMENTING COUNT
GENO: CLR RO ;0>RO
        BR GENEX
GEN1: CLR RO ;NOT0>RO
        COM RO
        BR GENEX
GEN52: MOV #52525,R0 ;5252>RO
        BR GENEX
GEN25: MOV #125252,R0 ;125252>RO
        BR GENEX
GENR1: CLC
        JSR PC,GENROT
        BR GENEX
GENRO: CLC
        JSR PC,GENROT
        COM RO ;SHIFT 0 > RO
        BR GENEX
GENROT: ROR GENISH ;ROTATE 1 PATTERN
        BNE GENER1 ;= 0?
        MOV #100000,GENISH ;YES, SET MSB
        MOV GENISH,R0 ;PUT 1 IN RO
        RTS PC ;AND EXIT
GENISH: 1
GENRAN: MOV #5,RANSEL ;SET SELECT VALUE TO 5
        JSR PC,RANGEN ;GENERATE RANDOM NUMBER IN RO
        MOV RANDN,R0
        BR GENEX
RANGEN: MOV RANDN,R2
        BNE RAN1
        MOV RANST,R2
        BIT #777,RANSEL ;IS RANDOM = 0
        BNE RAN2 ;YES, PUT RANDOM START VALUE IN
        MOV #1,RANSEL ;NO;IS RANSEL SELECT VALUE = 0
        MOV RANSEL,R3 ;YES: SET RANSEL = 1
        MOV RANDN,R2
        BIT RANMTA,R2 ;GET R2 <0 AND 1>
        BEQ RANCLC
        COM R2
        BIT RANMTA,R2
        BEQ RANCLC
        BR RANSEC
RANCLC: CLC
        BR RAN4
RANSEC: SEC

```

NUMBER GENERATOR

1739 013420 006037 002350  
 1740 013424 005303  
 1741 013426 001357  
 1742 013430 000207  
 1743 013432 013700 002272  
 1744 013436 005200  
 1745 013440 010037 002272  
 1746 013444 004737 013540  
 1747 013450 013737 002272 012400  
 1748 013456 000207  
 1749

RAN4: ROR RANDN  
 DEC R3  
 BNE RAN2+4  
 RANEX: RTS PC  
 GENINC: MOV GOOD,RO  
 INC RO  
 GENEX: MOV RO,GOOD  
 JSR PC,RSTREG  
 MOV GOOD,DATA  
 RTS PC

;ROTATE C TO B15  
 ;IS THIS NUMBER REQUIRED?  
 ;NO, GET ANOTHER  
 ;YES, EXIT  
 ;INCREMENTS LOC. 'GOOD'

SAVE REGISTERS

1751  
1752  
1753  
1754  
1755  
1756  
1757  
1758  
1759  
1760  
1761  
1762  
1763  
1764  
1765  
1766  
1767  
1768  
1769  
1770  
1771  
1772  
1773  
1774  
1775  
1776  
1777  
1778  
1779  
1780  
1781  
1782  
1783  
1784  
1785  
1786  
1787  
1788  
1789  
1790  
1791  
1792  
1793  
1794  
1795  
1796  
1797  
1798  
1799  
1800  
1801  
1802  
1803  
1804  
1805 013460  
1806 013466  
1807 013474 012637 002246

```

.SBTTL SAVE REGISTERS

DESCRIPTION:

ROUTINE TO SAVE ALL THE GENERAL PURPOSE
REGISTERS ON THE STACK, AND LEAVE THE ADDRESS OF THE
CALLING ROUTINE ON THE STACK. THE ROUTINE WILL RUN AT
PRIORITY 7 TO AVOID ANY INTERRUPTS

CAUTION:REGISTER R0 IS NOT SAVED

CALLING SEQUENCE:

JSR PC,SAVREG

INPUT PARAMETERS:

NONE

IMPLICIT INPUT PARAMETERS:

NONE

OUTPUT PARAMETERS:

REGISTERS 0 THRU 5 ARE SAVED ON THE STACK
AND THE RETURN ADDRESS OF THE CALLING ROUTINE IS
SET AS THE LAST ENTRY ON THE STACK

IMPLICIT OUTPUT PARAMETERS:

NONE

COMPLETION CODES:

NONE

POSSIBLE ERROR CODES:

NONE

SAVREG: GETPRI SAVSTA
SETPRI MAXPRI
MOV (SP)+,SAVPC ;SAVE PC FOR RETURN FROM THIS ROUTINE

```

SAVE REGISTERS

1808	013500	012637	002352	MOV	(SP)+,SAVPC1	
1809	013504	010546		MOV	R5,-(SP)	
1810	013506	010446		MOV	R4,-(SP)	
1811	013510	010346		MOV	R3,-(SP)	
1812	013512	010246		MOV	R2,-(SP)	
1813	013514	010146		MOV	R1,-(SP)	
1814	013516	010046		MOV	R0,-(SP)	
1815	013520	013746	002352	MOV	SAVPC1,-(SP)	
1816	013524	013746	002246	MOV	SAVPC,-(SP)	;PUT PC READY FOR
1817	013530			SETPRI	SAVSTA	
1818	013536	000207		RTS	PC	;RETURN
1819						
1820						
1821						

RESTORE REGISTERS

1823  
1824  
1825  
1826  
1827  
1828  
1829  
1830  
1831  
1832  
1833  
1834  
1835  
1836  
1837  
1838  
1839  
1840  
1841  
1842  
1843  
1844  
1845  
1846  
1847  
1848  
1849  
1850  
1851  
1852  
1853  
1854  
1855  
1856  
1857  
1858  
1859  
1860  
1861  
1862  
1863  
1864  
1865  
1866  
1867  
1868  
1869  
1870  
1871  
1872  
1873  
1874 013540  
1875 013546  
1876 013554 012637 002246  
1877 013560 012637 002352  
1878 013564 012600  
1879 013566 012601

```

.SBTTL  RESTORE REGISTERS

:
:
:
DESCRIPTION:
:
: RESTORE TO RESTORE THE GENERAL PURPOSE
: REGISTERS. THE STACK IS LEFT IN THE SAME STATE AS IT
: WAS WHEN SAVREG WAS CALLED.
:
: CAUTION:  REGISTER R0 IS NOT SAVED
:
:
: CALLING SEQUENCE:
:         JSR     PC,RSTREG
:
: INPUT PARAMETERS:
:         NONE
:
: IMPLICIT INPUT PARAMETERS:
:         NONE
:
: OUTPUT PARAMETERS:
:         R1 THRU R5 RESTORED
:
: IMPLICIT OUTPUT PARAMETERS:
:         NONE
:
: COMPLETION CODES:
:         NONE
:
: POSSIBLE ERROR CODES:
:         NONE
:
RSTREG: GETPRI  SAVSTA
        SETPRI  MAXPRI
        MOV     (SP)+,SAVPC
        MOV     (SP)+,SAVPC1
        MOV     (SP)+,R0
        MOV     (SP)+,R1

```

RESTORE REGISTERS

1880	013570	012602		MOV	(SP)+,R2	
1881	013572	012603		MOV	(SP)+,R3	
1882	013574	012604		MOV	(SP)+,R4	
1883	013576	012605		MOV	(SP)+,R5	
1884	013600	013746	002352	MOV	SAVPC1,-(SP)	
1885	013604	013746	002246	MOV	SAVPC,-(SP)	;PUT PC READY FOR
1886	013610			SETPRI	SAVSTA	
1887	013616	000207		RTS	PC	

RESTORE REGISTERS

```

1889           ;CHECK CONTENT OF ONE OF THE 8 REGISTERS
1890
1891           ; CALLING SEQUENCE
1892           ;       JSR      R5,CKSELN           ; N = REGISTER NUMBER
1893           ;       .WORD A                   A=EXPECTED CONTENT OF REGISTER N
1894
1895           ;OUTPUT PARAMETER:
1896           ;       BRANCH IN PC+2 IF ERROR DETECTED
1897           ;       BRANCH IN PC IF NO ERROR DETECTED
1898
1899
1900
1901
1902
1903 013620 012537 002272           CKSELO: MOV      (R5)+,GOOD           ;WRITE GOOD
1904 013624 017737 176624 002316           MOV      @KMVCSR,SELO           ;READ SEL 0
1905 013632 023737 002316 002272           CMP      SELO,GOOD             ;CMP ?
1906 013640 001001                       BNE      1$
1907 013642 000402                       BR       2$
1908 013644 062705 000002           1$:     ADD      @2,R5
1909 013650 000205                       2$:     RTS      R5
1910
1911
1912
1913
1914
1915
1916
1917 013652 005037 002272           CBSELO: CLR      GOOD
1918 013656 012537 002272           MOV      (R5)+,GOOD
1919 013662 117737 176566 012376           MOVB    @KMVCSR,BSELO
1920 013670 123737 012376 002272           CMPB    BSELO,GOOD
1921 013676 001001                       BNE      1$
1922 013700 000402                       BR       2$
1923 013702 062705 000002           1$:     ADD      @2,R5
1924 013706 000205                       2$:     RTS      R5

```

## RESTORE REGISTERS

```

1926           ;ROUTINE TO CHECK ALL REGISTER FROM SEL0 TO SEL16
1927
1928
1929           ;CALLING SEQUENCE:
1930           :      JSR R5,CKALL
1931           :      .WORD A           A = EXPECTED VALUE FOR SEL0
1932           :      .WORD B           B      "      "      SEL2
1933           :      .WORD C           C      "      "      SEL4
1934           :      .WORD D           D      "      "      SEL6
1935           :      .WORD E           E      "      "      SEL10
1936           :      .WORD F           F      "      "      SEL12
1937           :      .WORD G           G      "      "      SEL14
1938           :      .WORD H           H      "      "      SEL16
1939
1940
1941           ;OUTPUT PARAMETER:
1942           :      BRANCH IN PC+2 IF ERROR
1943           :      BRANCH IN PC IF NO ERROR
1944
1945
1946
1947 013710 012537 002274      CKALL:  MOV      (R5)+,GOOD0
1948 013714 012537 002300      MOV      (R5)+,GOOD2
1949 013720 012537 002302      MOV      (R5)+,GOOD4
1950 013724 012537 002304      MOV      (R5)+,GOOD6
1951 013730 012537 002306      MOV      (R5)+,GOOD10
1952 013734 012537 002310      MOV      (R5)+,GOOD12
1953 013740 012537 002312      MOV      (R5)+,GOOD14
1954 013744 012537 002314      MOV      (R5)+,GOOD16
1955
1956 013750 017737 176500 002316      MOV      @KMVCSR,SEL0           ;READ SEL0
1957 013756 000240      NOP
1958 013760 017737 176472 002322      MOV      @KMVP02,SEL2         ;READ SEL2
1959 013766 000240      NOP
1960 013770 017737 176464 002324      MOV      @KMVP04,SEL4         ;READ SEL4
1961 013776 000240      NOP
1962 014000 017737 176456 002326      MOV      @KMVP06,SEL6         ;READ SEL6
1963 014006 000240      NOP
1964 014010 017737 176450 002330      MOV      @KMVP10,SEL10        ;READ SEL10
1965 014016 000240      NOP
1966 014020 017737 176442 002332      MOV      @KMVP12,SEL12        ;READ SEL12
1967 014026 000240      NOP
1968 014030 017737 176434 002334      MOV      @KMVP14,SEL14        ;READ SEL14
1969 014036 000240      NOP
1970 014040 017737 176426 002336      MOV      @KMVP16,SEL16        ;READ SEL16
1971
1972 014046 023737 002316 002274      CMP      SEL0,GOOD0
1973 014054 001035      BNE     1$
1974 014056 023737 002322 002300      CMP      SEL2,GOOD2
1975 014064 001031      BNE     1$
1976 014066 023737 002324 002302      CMP      SEL4,GOOD4
1977 014074 001025      BNE     1$
1978 014076 023737 002326 002304      CMP      SEL6,GOOD6
1979 014104 001021      BNE     1$
1980 014106 023737 002330 002306      CMP      SEL10,GOOD10
1981 014114 001015      BNE     1$
1982 014116 023737 002332 002310      CMP      SEL12,GOOD12

```



RESTORE REGISTERS

1983	014124	001011			BNE	1\$
1984	014126	023737	002334	002312	CMP	SEL14,GOOD14
1985	014134	001005			BNE	1\$
1986	014136	023737	002336	002314	CMP	SEL16,GOOD16
1987	014144	001001			BNE	1\$
1988						
1989	014146	000402			BR	2\$
1990	014150	062705	000002	1\$:	ADD	#2,R5
1991	014154	000205		2\$:	RTS	R5

RESTORE REGISTERS

;ROUTINE TO CHECK SEL2 TO SEL16

1993					
1994					
1995					
1996					
1997					
1998					
1999	014156	012537	002300	CKREG:	MOV (R5)+,GOOD2
2000	014162	012537	002302		MOV (R5)+,GOOD4
2001	014166	012537	002304		MOV (R5)+,GOOD6
2002	014172	012537	002306		MOV (R5)+,GOOD10
2003	014176	012537	002310		MOV (R5)+,GOOD12
2004	014202	012537	002312		MOV (R5)+,GOOD14
2005	014206	012537	002314		MOV (R5)+,GOOD16
2006					
2007					
2008	014212	017737	176240	002322	MOV @KMVP02,SEL2
2009	014220	000240			NOP
2010	014222	017737	176232	002324	MOV @KMVP04,SEL4
2011	014230	000240			NOP
2012	014232	017737	176224	002326	MOV @KMVP06,SEL6
2013	014240	000240			NOP
2014	014242	017737	176216	002330	MOV @KMVP10,SEL10
2015	014250	000240			NOP
2016	014252	017737	176210	002332	MOV @KMVP12,SEL12
2017	014260	000240			NOP
2018	014262	017737	176202	002334	MOV @KMVP14,SEL14
2019	014270	000240			NOP
2020	014272	017737	176174	002336	MOV @KMVP16,SEL16
2021					
2022					
2023					
2024					
2025	014300	023737	002322	002300	CMP SEL2,GOOD2
2026	014306	001031			BNE 1\$
2027	014310	023737	002324	002302	CMP SEL4,GOOD4
2028	014316	001025			BNE 1\$
2029	014320	023737	002326	002304	CMP SEL6,GOOD6
2030	014326	001021			BNE 1\$
2031	014330	023737	002330	002306	CMP SEL10,GOOD10
2032	014336	001015			JNE 1\$
2033	014340	023737	002332	002310	CMP SEL12,GOOD12
2034	014346	001011			BNE 1\$
2035	014350	023737	002334	002312	CMP SEL14,GOOD14
2036	014356	001005			BNE 1\$
2037	014360	023737	002336	002314	CMP SEL16,GOOD16
2038	014366	001001			BNE 1\$
2039	014370	000402			BR 2\$
2040					
2041	014372	062705	000002	1\$:	ADD #2,R5
2042	014376	000205		2\$:	RTS R5

RESTORE REGISTERS

```

2044 ;ROUTINE TO CLEAR KMV11 MODULE
2045
2046
2047 ;CALLING SEQUENCE:
2048 ; JSR PC,CLRKMV
2049
2050 ;ROUTINE DESCRIPTION: CLEAR ALL CSR'S REGISTERS AND CHECK IF = 0
2051
2052
2053

```

```

2054 014400 CLRKMV: CLR @KMVCSR ;CLEAR REGISTERS
2055 014400 005077 176050 MOV @MAINTO,@KMVCSR ;SET MAINTENANCE MODE
2056 014404 012777 054000 176042 WAITA 0
2057 014412
2058
2059
2060
2061 014424 012702 000010 MOV #10,R2
2062 014430 013701 012454 MOV KMVCSR,R1 ;LOAD ADDRESS
2063 014434 005021 1$: CLR (R1)+ ;CLEAR
2064 014436 005302 DEC R2 ;ALL DONE
2065 014440 001375 BNE 1$ ;NO
2066 014442 004537 013710 JSR R5,CKALL ;CHECK ALL REG = 0
2067 014446 000000 .WORD 0
2068 014450 000000 .WORD 0
2069 014452 000000 .WORD 0
2070 014454 000000 .WORD 0
2071 014456 000000 .WORD 0
2072 014460 000000 .WORD 0
2073 014462 000000 .WORD 0
2074 014464 000000 .WORD 0
2075 014466 000404 BR 2$ ;OK BRANCH AT END
2076 014470 ERRHRD 1,EM0002,PRALL ;CSR'S REGISTERS CAN'T BE CLEARED
2077 014500 000207 2$: RTS PC
2078

```

## RESTORE REGISTERS

```

2080           ;ROUTINE TO SET MAINT MODE 1 AND CHECK DCT11 CLEAR SELO AFTER HAVING DECODED
2081
2082
2083
2084           ;CALLING SEQUENCE:
2085           ;      JSR PC,MAINM1
2086
2087
2088
2089           ;GIVE AN ERROR IF MASTER CLEAR IS NOT CLEAR BY DCT11
2090           ;
2091           ;MAINT1= MASTER CLEAR=1 + MAINT 1 =0 + MODE = 1 : T11=HOLD
2092
2093
2094
2095
2096
2097
2098
2099 014502 012777 044000 175744 MAINM1: MOV     @MAINT1,@KMVCSR           ;LOAD ADDRESS
2100 014510 012737 000000 002266      MOV     #0,DELCT1
2101 014516 012737 000001 002270      MOV     #1,DELCT2
2102 014524 004737 012706      JSR     PC,WAIT2
2103 014530 004537 013620      JSR     R5,CKSELO           ;CHECK SELO=0 BUT MODE BIT =1
2104 014534 004000      .WORD 4000
2105 014536 000404      BR     1$                 ;OK BRANCH
2106 014540      ERRHRD 2,EM0001,PRSELO
2107 014550 000207      1$:  RTS     PC
2108
2109
2110
2111
2112

```

RESTORE REGISTERS

2114  
2115  
2116  
2117  
2118  
2119  
2120  
2121  
2122  
2123  
2124  
2125  
2126  
2127

;ROUTINE TO SET TEST NUMBER ON BSELO

;CALLING SEQUENCE:  
; JSR R5,TSTNUB  
; .WORD A

A=TEST MICRO PROGRAM NUMBER

2128 014552 012537 012420  
2129 014556 053777 012420 175670  
2130 014564 012737 000000 002266  
2131 014572 004737 012726  
2132 014576 000205

TSTNUB: MOV (R5)+,NUB  
BIS NUB,@KMVCSR  
MOV #0000,DELCT1  
JSR PC,WAIT1  
RTS R5

;LOAD TEST NUMBER

;WAIT

RESTORE REGISTERS

```

2134 ;ROUTINE TO CHECK IF KMV11A OR B AND IF LOOP BACK CONNECTOR
2135 ;ARE PLUGGED OR NOT
2136
2137
2138
2139
2140
2141 ;CALLING SEQUENCE:
2142
2143 ;JSR PC,CKKMV
2144
2145
2146
2147 ;OUTPUTS: IF LOOP BACK LOOP=1
2148 ; IF NO LOOP BACK LOOP=0
2149
2150 ; IF KMV11 A KIND=0
2151 ; IF KMV11 B KIND=1
2152
2153
2154
2155
2156 ;MICRO DIAG NB 44 DESCRIPTION:
2157 ;DCT11 LOOK IF KMV11A OR B BY READING BIT 1 OF 8255 CHIP PORT C
2158 ;IF THIS BIT =0 IT IS KMV11 B MODULE AND DCT11 SET 1 IN BSEL4
2159 ; " " 1 " " A " " 0 "
2160 ;
2161 ;DCT11 LOOK IF LOOP BACK OR NOT BY READING BIT 0 OF 8255 CHIP
2162 ;IF THIS BIT =0 LOOP BACK CONNECTOR ARE PLUGGED SO DCT11 SET 1
2163 ;IN BSEL2 IN OTHER CASE BSEL2=0
2164 ;
2165 ;NOTE:PORT C ADDRESS=13006
2166 ;
2167
2168
2169
2170 014600 004737 014400 CKKMV: JSR PC,CLRKMV
2171 014604 004737 014502 JSR PC,MAINM1 ;SET MAINT MODE
2172 014610 004537 014552 JSR R5,TSTNUB ;CHECK WHICH KMV11 AND IF LOOP BACK
2173 014614 000044 .WORD 44
2174
2175 014616 004737 013102 JSR PC,TSTERR ;LOOK IF TEST CORRECTLY DONE
2176 014622 000412 BR 1$
2177 014624 000402 BR 2$
2178 014626 000401 BR 2$
2179 014630 000400 BR 2$
2180
2181
2182
2183 014632 2$: ERRHRD 3,EM0004 ;NO KMV11 ANSWER
2184 014642 004737 012740 JSR PC,CHKMAX ;LOOK IF MAX ERROR
2185 014646 000207 RTS PC
2186
2187 014650 017737 175602 012474 1$: MOV @KMVP02,LOOP ;WRITE LOOP BIT
2188 014656 042737 177776 012474 BIC @177776,LOOP
2189 014664 017737 175570 012404 MOV @KMVP04,KIND ;WRITE KIND
2190 014672 042737 177776 012404 BIC @177776,KIND

```

C5

KMV11 B LINE CNT DIAG. MACRO M1200 05-JUN-84 15:56 PAGE 44-1

SEQ 0054

RESTORE REGISTERS

2191 014700 000207

RTS PC

RESTORE REGISTERS

```

2193
2194           ;ROUTIN TO WRITE OR READ ONE OF THE KMV11 REGISTERS
2195
2196
2197
2198           ;CALLING SEQUENCE:
2199           ;JSR   R5,WRITE
2200           ;.WORD A           A=ADDRESS TO WRITE
2201           ;.WORD B           B=DATA TO WRITE
2202           ;
2203           ;
2204           ;
2205           ;JSR   R5,READ
2206           ;.WORD A           A=ADDRESS TO READ
2207           ;
2208           ;
2209           ;
2210           ;MICRO DIAG NB 47 DESCRIPTION:
2211           ;WRITE: PUT ADDRESS TO WRITE IN SEL2
2212           ;        PUT DATA TO WRITE IN SEL4
2213           ;        SET BIT 0 OF SEL6(WRITE BIT)
2214           ;        SET TEST NB 44
2215           ;        KMV11 CLEAR BSEL0 WHEN DONE
2216           ;
2217           ;
2218           ;READ:  PUT ADDRESS TO READ IN SEL2
2219           ;        CLEAR BIT 0 IN SEL6
2220           ;        SET TEST 47
2221           ;        KMV11 READ ADDRESS IN SEL2 AND CLEAR BSEL0 WHEN DONE
2222           ;
2223           ;
2224           ;
2225           ;
2226 014702 012577 175550      WRITE:  MOV    (R5)+,@KMVP02      ;WRITE ADDRESS
2227 014706 012577 175546      MOV    (R5)+,@KMVP04      ; " DATA
2228 014712 012777 000001 175542  MOV    #1,@KMVP06        ;BIT WRITE
2229
2230 014720 004537 014552      JSR    R5,TSTNUB        ;SEND TEST NB 47
2231 014724 000047
2232
2233 014726 000205      RTS    R5              ;RETURN
2234
2235
2236
2237
2238
2239
2240 014730 012577 175522      READ:  MOV    (R5)+,@KMVP02      ;SET ADDRESS TO READ
2241 014734 005077 175520      CLR    @KMVP04
2242 014740 005077 175516      CLR    @KMVP06
2243
2244 014744 004537 014552      JSR    R5,TSTNUB        ;SEND TEST NB 44
2245 014750 000047
2246
2247
2248 014752 004737 013102      JSR    PC,TSTERR        ;CHECK BSEL 0
2249 014756 000412      BR     1$              ;OK

```





RESTORE REGISTERS

2264  
2265  
2266  
2267  
2268  
2269  
2270  
2271  
2272  
2273  
2274  
2275  
2276  
2277  
2278  
2279  
2280  
2281  
2282  
2283  
2284  
2285  
2286  
2287  
2288

```

.MACRO ROMCLK
.LIST
    JSR    R5,.ROMCLK    ;CLOCK INSTRUCTION
.NLIST
.ENDM

.MACRO ED$CALL XY
.LIST
;***** TEST'XY' *****
.NLIST
.ENDM

.MACRO BADHEAD
.RADIX 10
ED$CALL \T$TESTNUM+1
.RADIX 8
.ENDM

```

## GLOBAL ERROR REPORT SECTION

```

2290      .SBTTL GLOBAL ERROR REPORT SECTION
2291
2292      ;////////////////////
2293      ;/      THE GLOBAL ERROR REPORT SECTION CONTAINS ERROR MESSAGES
2294      ;/      THAT ARE USED IN MORE THAN ONE TEST.
2295      ;////////////////////
2296
2297      .NLIST BEX
2298
2299 015014    040    102    125 TIM:      .ASCIZ / BUS TIMEOUT /
2300
2301 015032    045    116    045 TFM36:   .ASCIZ /%N%AREGISTER ADDRESS ERROR,ADDRESS = %06%A,UNIT = %02/
2302
2303 015120    115    101    123 EM0001: .ASCIZ /MASTER CLEAR FAILS TO RESET: DCT11 CAN'T CLEAR MASTER CLEAR /
2304
2305 015215    040    113    115 EM0002: .ASCIZ / KMV11 REGISTERS CANNOT BE CLEARED /
2306
2307 015261    040    104    101 EM0003: .ASCIZ / DATA COMPARE ERROR ON KMV11 REGISTER (SEL2 TO SEL16)/
2308
2309 015347    040    116    117 EM0004: .ASCIZ / NO ANSWER FROM KMV11 /
2310
2311 015376    040    124    111 EM0006: .ASCIZ / TIMEOUT DURING KMV11 MICRO TEST /
2312
2313 015440    111    116    124 EM0007: .ASCIZ /INTERRUPT OCCURED ON KMV11,WHEN ADDRESSING CSR REGISTER/
2314
2315 015531    116    117    040 EM0010: .ASCIZ /NO KMV11 INTERRUPT WHEN CSR'S ARE ACCESSED/
2316
2317 015604    113    115    126 EM0011: .ASCIZ /KMV11 REAL LINE TIME CLOCK FAILED TO INTERRUPT /
2318
2319 015664    103    110    101 EM0012: .ASCIZ /CHANEL A GENERATOR COUNT CANNOT BE READ OR WRITTEN CORRECTLY /
2320
2321 015762    103    110    101 EM0013: .ASCIZ /CHANEL A GENERATOR OUTPUT IS NOT CORRECT/
2322
2323 016034    103    110    101 EM0112: .ASCIZ /CHANEL B GENERATOR COUNT CANNOT BE READ OR WRITTEN CORRECTLY /
2324
2325 016132    103    110    101 EM0113: .ASCIZ /CHANEL B GENERATOR OUTPUT IS NOT CORRECT/
2326
2327 016204    125    116    101 EM0033: .ASCIZ /UNABLE TO CHANGE BAUD RATE GENERATOR COUNTER /
2328
2329 016262    116    117    040 EM0014: .ASCIZ /NO CHANGE ON BAUD RATE GENERATOR OUTPUT /
2330
2331 016333    124    122    101 EM0015: .ASCIZ /TRANSMISSION ERROR IN INTERNAL LOOP ON CH A WITHOUT INTERRUPTS/
2332
2333 016432    105    122    122 EM0016: .ASCIZ /ERROR WHEN TRANSMITTING FRAMES IN INTERNAL LOOPBACK ON CH A /
2334
2335 016527    124    122    101 EM0115: .ASCIZ /TRANSMISSION ERROR IN INTERNAL LOOP ON CH B WITHOUT INTERRUPTS/
2336
2337 016626    105    122    122 EM0116: .ASCIZ /ERROR WHEN TRANSMITTING FRAMES IN INTERNAL LOOPBACK ON CH B /
2338
2339 016723    105    122    122 EM0017: .ASCIZ /ERROR WHEN TRANSMITTING FRAMES IN EXTERNAL LOOP BACK ON CH A/
2340
2341 017020    105    122    122 EM0020: .ASCIZ /ERROR WHEN TRANSMITTING FRAMES IN EXTERNAL LOOP BACK ON CH B/
2342
2343 017115    113    115    126 EM0023: .ASCIZ /KMV11 REAL TIME CLOCK INTERRUPT OCCURED TOO EARLY /
2344
2345 017200    111    116    103 EM0024: .ASCIZ /INCORRECT KMV11 REPLY /
2346

```

## GLOBAL ERROR REPORT SECTION

2347	017227	116	117	040	EM0027: .ASCIZ /NO LOOP BACK CONNECTOR ,TEST NOT EXECUTED/
2348					
2349	017301	104	101	124	EM0030: .ASCIZ /DATA COMPARE ERROR BETWEEN MODEM SIGNAL 108 AND 107 ON CH A /
2350					
2351	017376	104	101	124	EM0130: .ASCIZ /DATA COMPARE ERROR BETWEEN MODEM SIGNAL 108 AND 107 ON CH B /
2352					
2353	017473	115	117	104	EM0032: .ASCIZ /MODEM SIGNAL ERROR ON CHANEL A IN EXTERNAL LOOPBACK MODE/
2354					
2355	017564	115	117	104	EM0034: .ASCIZ /MODEM SIGNAL ERROR ON CHANEL B IN EXTERNAL LOOPBACK MODE/
2356					
2357	017655	120	122	117	EM0035: .ASCIZ /PROM REVISION IS NOT COMPATIBLE WITH DIAGNOSTIC /
2358					
2359					
2360					
2361					



GLOBAL ERROR REPORT SECTION

```

2403
2404          .EVEN
2405
2406
2407
2408          :-----:
2409          : MACRO'S NEEDED TO REPORT ERRORS
2410          :-----:
2411
2412 021520          BGNMSG  PRSELO          ;REPORT SELO
2413 021520          PRINTB  #MSELO,SELO,GOOD
2414 021550 004737 012740 JSR      PC,CHKMAX
2415 021554          ENDMSG
2416
2417
2418
2419 021556          BGNMSG  PRINT
2420 021556          PRINTB  #MINT,GOOD,BAD
2421 021606 004737 012740 JSR      PC,CHKMAX          ;CHECK IF TOO MANY ERROR
2422 021612          ENDMSG
2423
2424
2425 021614          BGNMSG  PRALL          ;REPORT CONTENT OF ALL CSR'S
2426 021614          PRINTB  #MREG0,SELO,GOOD0
2427 021644          PRINTB  #MREG2,SEL2,GOOD2
2428 021674          PRINTB  #MREG4,SEL4,GOOD4
2429 021724          PRINTB  #MREG6,SEL6,GOOD6
2430 021754          PRINTB  #MREG10,SEL10,GOOD10
2431 022004          PRINTB  #MREG12,SEL12,GOOD12
2432 022034          PRINTB  #MREG14,SEL14,GOOD14
2433 022064          PRINTB  #MREG16,SEL16,GOOD16
2434 022114 004737 012740 JSR      PC,CHKMAX          ;CHECK IF TOO MANY ERROR
2435 022120          ENDMSG
2436
2437
2438
2439
2440
2441
2442 022122          BGNMSG  PRREG          ;REPORT ALL CSR'S BUT SELO
2443 022122          PRINTB  #MREG2,SEL2,GOOD2
2444 022152          PRINTB  #MREG4,SEL4,GOOD4
2445 022202          PRINTB  #MREG6,SEL6,GOOD6
2446 022232          PRINTB  #MREG10,SEL10,GOOD10
2447 022262          PRINTB  #MREG12,SEL12,GOOD12
2448 022312          PRINTB  #MREG14,SEL14,GOOD14
2449 022342          PRINTB  #MREG16,SEL16,GOOD16
2450 022372 004737 012740 JSR      PC,CHKMAX          ;CHECK IF TOO MANY ERROR
2451 022376          ENDMSG
2452
2453
2454
2455
2456
2457
2458
2459 022400          BGNMSG  PBSELO          ;REPORT BSELO

```

## GLOBAL ERROR REPORT SECTION

2460	022400			PRINTB	#MBSELO,BSELO,GOOD	
2461	022430	004737	012740	JSR	PC,CHKMAX	;CHECK IF TOO MANY ERROR
2462	022434			ENDMSG		
2463						
2464						
2465						
2466						
2467						
2468						
2469						
2470						
2471	022436			BGNMSG	PINTR	;REPORT INTERRUPT
2472	022436			PRINTB	#MINTR,ADDR	
2473	022462	004737	012740	JSR	PC,CHKMAX	;CHECK IF TOO MANY ERROR
2474	022466			ENDMSG		
2475						
2476						
2477						
2478						
2479						
2480	022470			BGNMSG	PVECT	;REPORT VECTOR
2481	022470			PRINTB	#MVECT,VECT,GOOD	
2482	022520	004737	012740	JSR	PC,CHKMAX	;CHECK IF TOO MANY ERROR
2483	022524			ENDMSG		
2484						
2485						
2486						
2487						
2488	022526			BGNMSG	PRT11V	
2489	022526			PRINTB	#MT11V,VECT,GOOD	
2490	022556	004737	012740	JSR	PC,CHKMAX	;CHECK IF TOO MANY ERROR
2491	022562			ENDMSG		
2492						
2493						
2494						
2495						
2496	022564			BGNMSG	PFRAME	;REPORT FRAME ERROR
2497	022564			PRINTB	#MFRAM1,RXDATA,TXDATA	
2498	022614			PRINTB	#MFRAM2,TSPEED,LENGTH	
2499	022644	004737	012740	JSR	PC,CHKMAX	;CHECK IF TOO MANY ERROR
2500	022650			ENDMSG		
2501						
2502						
2503						
2504						
2505						
2506	022652			BGNMSG	PMODEM	;REPORT MODEM SIGNAL ERROR
2507	022652			PRINTB	#MODEM1,GOOD	
2508	022676			PRINTB	#MODEM2,BAD	
2509	022722			PRINTB	#MODEM3,DATA	
2510	022746	004737	012740	JSR	PC,CHKMAX	;CHECK IF TOO MANY ERROR
2511	022752			ENDMSG		
2512						
2513						
2514						
2515						
2516						

GLOBAL ERROR REPORT SECTION

```

2517
2518
2519 022754      BGNMSG  PRAMEF
2520 022754      PRINTB  @MRAMEF, TXDATA, RXDATA      ;SHORT REPORT FOR FRAME ERROR
2521 023004      ENDMSG
2522
2523
2524
2525
2526
2527
2528
2529
2530 023006      BGNMSG  PRSTER                        ;REPORT ERROR STATUS ,WORD CNT
2531 023006      PRINTB  @MSTER1, STAERR
2532 023032      PRINTB  @MSTER2, WRDCNT
2533 023056 004737 012740 JSR      PC, CHKMAX      ;CHECK IF TOO MANY ERROR
2534 023062      ENDMSG
2535
2536
2537
2538 023064      BGNMSG  PADFLT                        ;ADDRESS TEST
2539 023064      PRINTB  @TFM36, ADDR, UNIT
2540 023114 004737 012740 JSR      PC, CHKMAX
2541 023120      ENDMSG
2542
2543
2544
2545

```



REPORT CODING SECTION

.SBTTL REPORT CODING SECTION

;++  
: THE REPORT CODING SECTION CONTAINS THE  
: "PRINTS" CALLS THAT GENERATE STATISTICAL REPORTS.  
:--

2547  
2548  
2549  
2550  
2551  
2552  
2553  
2554  
2555 023122  
2556  
2562  
2563 023122  
2564  
2571  
2572 023126  
2573  
2574

BGNRPT

EXIT RPT

ENDRPT

INITIALIZE SECTION

```

2576          .SBTTL  INITIALIZE SECTION
2577
2578          ;//////////
2579          ;/ THE INITIALIZE SECTION CONTAINS THE CODING THAT IS PERFORMED
2580          ;/ AT THE BEGINNING OF EACH PASS.
2581          ;//////////
2582
2583 023130      BGNINIT
2584
2585
2620
2621          .EVEN
2622
2623          .EVEN
2624
2625 023130      SETVEC  #140,#170000,#340          ;ODT ROM ADDRESS          ;JB REV A-0
2626
2627
2628
2629          ;INITIALIZE SUBROUTINE STACK
2630 023156 012705 012676      MOV          #SSTACK,R5
2631          ;STORE BASE LEVEL PROGRAM STACK POINTER
2632 023162 010637 002242      MOV          SP,PSTACK
2633 023166 005737 002252      TST          FTIME
2634 023172 001011              BNE          1$
2635 023174 013737 000004 002254      MOV          @#4,SAVE4
2636 023202 013737 000006 002256      MOV          @#6,SAVE6
2637 023210 012737 000001 002252      MOV          #1,FTIME
2638 023216 013737 002254 000004 1$: MOV          SAVE4,@#4
2639 023224 013737 002256 000006      MOV          SAVE6,@#6
2640
2641 023232          READEF  #EF.START          ;START COMMAND?
2642 023240          BCOMPLETE      SETUP          ;IF YES BRANCH
2643
2644 023242          READEF  #EF.CONTINUE          ;CONTINUE COMMAND?
2645 023250          BCOMPLETE      END
2646
2647 023252          READEF  #EF.NEW          ;NEW PASS?
2648 023260          BNCOMPLETE      NEXT          ;IF NOT EXIT SETUP
2649
2650 023262 012737 177777 012436  SETUP: MOV          #-1,UUT          ;INITIALISE UNIT NUMBER
2651
2652 023270 005237 012436          NEXT:  INC          UUT          ;POINT NEXT UNIT
2653 023274 023737 012436 002262      CMP          UUT,L$UIT          ;ALL DONE?
2654 023302 001523              BEQ          ABORT          ;IF YES END OF PASS
2655
2656 023304 013737 012436 002264      MOV          UUT,UNIT
2657 023312          PRINTF  #RUNNING,UNIT
2658
2659
2660 023336          GPHARD  UUT,R1          ;GET P TABLE
2661 023346          BNCOMPLETE      NEXT          ;IF NOT AVAILABLE GET NEXT
2662
2663
2664 023350          GETPRM:
2665
2666 023350 011137 012454          MOV          (R1),KMVCSR          ;GET ADDRESS OF KMV11

```

INITIALIZE SECTION

```

2667
2668 023354 011137 012456      MOV      (R1),KMVP02      ;GET POINTER TO KMV11 SEL02 REG
2669 023360 062737 000002 012456  ADD      #2,KMVP02      ;GET POINTER TO KMV11 PORT REG - SEL 4
2670
2671 023366 011137 012460      MOV      (R1),KMVP04      ;GET POINTER TO KMV11 PORT REG - SEL 6
2672 023372 062737 000004 012460  ADD      #4,KMVP04
2673
2674 023400 011137 012462      MOV      (R1),KMVP06
2675 023404 062737 000006 012462  ADD      #6,KMVP06      ;GET POINTER TO KMV11 REG 10
2676
2677 023412 011137 012464      MOV      (R1),KMVP10
2678 023416 062737 000010 012464  ADD      #10,KMVP10     ;GET POINTER TO KMV11 REG 12
2679
2680 023424 011137 012466      MOV      (R1),KMVP12
2681 023430 062737 000012 012466  ADD      #12,KMVP12     ;GET POINTER TO KMV11 REG 14
2682
2683 023436 011137 012470      MOV      (R1),KMVP14
2684 023442 062737 000014 012470  ADD      #14,KMVP14     ;GET POINTER TO KMV11 REG 16
2685
2686 023450 012137 012472      MOV      (R1)+,KMVP16
2687 023454 062737 000016 012472  ADD      #16,KMVP16     ;GET POINTER TO VECTOR 0
2688
2689 023462 011137 012440      MOV      (R1),KMVV00      ;GET POINTER TO VECTOR 2
2690
2691 023466 011137 012446      MOV      (R1),KMVV02
2692 023472 062737 000002 012446  ADD      #2,KMVV02      ;GET POINTER TO VECTOR 4
2693
2694 023500 011137 012444      MOV      (R1),KMVV04
2695 023504 062737 000004 012444  ADD      #4,KMVV04      ;GET POINTER TO VECTOR 6
2696
2697 023512 012137 012450      MOV      (R1)+,KMVV06
2698 023516 062737 000006 012450  ADD      #6,KMVV06     ;GET POINTER TO TX PRIORITY LEVEL
2699
2700 023524 012137 012442      MOV      (R1)+,KMVLVL
2701 023530 062737 000006 012452  ADD      #6,KMTLVL     ;GET LOOPBACK PARAMETERS:
2702
2703 023536 011137 012474      MOV      (R1),LOOP
2704
2705 023542 005037 002236      CLR      ERRCNT          ;CLEAR ERROR COUNT
2706 023546      EXIT      INIT
2707
2708
2709
2710 023552      ABORT:  DOCLN          ;CLEAN UP AND ABORT PASS
2711 023554      EXIT INIT          ;EXIT
2712
2713
2714 023560      END:    ENDINIT
2715
2716
2717      .NLIST BEX
2718 023562      045    116    045 .LIST RUNNING: .ASCIZ /%N%A RUNNING ON UNIT #D2%A /
2719      .LIST BEX
2720      .EVEN
2721
2722
2723

```

AUTODROP SECTION

.SBTTL AUTODROP SECTION

2725  
2726  
2727  
2728  
2729  
2730  
2731  
2732  
2733  
2734 023620  
2735  
2742  
2743  
2744  
2745  
2746 023620 013701 012454  
2747 023624 012705 000007  
2748 023630 012737 023662 000004  
2749 023636 012737 000340 000006  
2750 023644 005711  
2751 023646 000240  
2752 023650 062701 000002  
2753 023654 005305  
2754 023656 001372  
2755 023660 000405  
2756  
2757 023662 062706 000004  
2758 023666  
2759  
2760 023674 013737 002254 000004  
2761 023702 013737 002256 000006  
2762 023710  
2763  
2764  
2765  
2766

\*\*\*  
; THIS CODE IS EXECUTED IMMEDIATELY AFTER THE INITIALIZE CODE IF  
; THE "ADR" FLAG WAS SET. THE UNIT(S) UNDER TEST ARE CHECKED TO  
; SEE IF THEY WILL RESPOND. THOSE THAT DON'T ARE IMMEDIATELY  
; DROPPED FROM TESTING.  
!--

.EVEN  
BGNAUTO

;DEVICE DOES NOT HAVE A "READY"  
MOV KMVCSR,R1 ;R1 CONTAINS BASE KMV11 ADDRESS  
MOV #7,R5 ;7 REGISTERS TO BE TESTED  
MOV #2#,4 ;SET OUT TIMEOUT TRAP  
MOV #340,6 ;LEVEL 7  
1\$: TST (R1) ;REFERENCE DEVICE REGISTERS  
NOP  
ADD #2,R1 ;NEXT REGISTER  
DEC R5 ;DEC REGISTER COUNT  
BNE 1\$ ;BR IF NOT LAST REGISTER  
BR 3\$  
2\$: ADD #4,SP  
DODU LOGDEV  
3\$: MOV SAVE4,4  
MOV SAVE6,6  
ENDAUTO

CLEANUP CODING SECTION

2768  
 2769  
 2770  
 2771  
 2772  
 2773  
 2774  
 2775 023712  
 2776  
 2777  
 2797  
 2798  
 2799  
 2800 023712  
 2801  
 2802 023714  
 2803  
 2804  
 2805  
 2806  
 2807

.SBTTL CLEANUP CODING SECTION

```

:////////////////////
:/ THE CLEANUP CODING SECTION CONTAINS THE CODING THAT IS PERFORMED
:/ AT THE END OF EACH PASS.
:////////////////////

```

BGNCLN

BRESET

ENDCLN

DROP UNIT SECTION

```

2809          .SBTTL  DROP UNIT SECTION
2810
2811          ;//////////
2812          ;// THE DROP-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
2813          ;// TO NO LONGER BE TESTED.
2814          ;//////////
2815
2816 023716          BGNDU
2817
2818
2819
2828
2829
2841
2842          .EVEN
2843
2844 023716          PRINTF  #DROPD,RO          ;UNIT DROPPED
2845
2846 023740          EXIT    DU
2847
2848
2849
2850
2851
2852 023744          045    116    045  DROPD:  .NLIST  BEX
2853                .ASCIZ  /%N%A UNIT %D2%A DROPPED/
2854                .LIST   BEX
2855                .EVEN
2856 023774          ENDDU
2857
2858
2859
2860
2861

```

ADD UNIT SECTION

2863  
2864  
2865  
2866  
2867  
2868  
2869  
2870  
2871  
2872  
2881  
2882 023776  
2883 023776  
2884  
2885  
2886  
2887  
2888  
2889  
2890  
2891

.SBTTL ADD UNIT SECTION

://  
:/ THE ADD-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE  
:/ TO BE (A) TESTED FOR THE FIRST TIME, OR (B) RESUMED IN TESTING. IF  
:/ "EF.AUNIT" IS SET, THE UNIT WILL BE TESTED AS A NEW UNIT.  
://

BGNAU  
ENDAU

## HARDWARE TESTS

```
2893          .SBTTL  HARDWARE TESTS
2894
2895
2896
2897          ;START OF CODE BLOCK WHICH IS USED AS DATA
2898 024000 ROMMAP:;+
2899          ; TEST TO ...
2900          ;--
2901
2902
2903
2904
2905
2906
2907
2908
2909
2910
2911
2912
2913
2914          ;      BGNTST
2915
2916
2917
2918
2919
2920
2921
2922          ;      EXIT  TST
2923
2924
2925
2926
2927
2928
2929
2930
2931
2932
2933
2934
2935
2936
2937          ;      .EVEN
2938          ;      ENDTST
2939
2940
2941
2942
2943
2944
2945
```



HARDWARE TESTS

2947 024000

BADHEAD

\*\*\*\*\* TEST1 \*\*\*\*\*

2948

;\*VERIFY THAT REFERENCING QBUS DEVICE REGISTERS

2949

;\*DOES NOT CAUSE TIME OUT TRAPS.

2950 024000

BADHEAD

\*\*\*\*\* TEST1 \*\*\*\*\*

2951

2952 024000

BGNTST

2953 024000 013701 012454

MOV KMVCSR,R1

;R1 CONTAINS KMV11 ADDRESSES

2954 024004 012705 000007

MOV #7,R5

;7 REGISTERS TO BE TESTED

2955 024010 012737 024046 000004

MOV #2\$,4

;SET OUT TIMEOUT TRAP

2956 024016 012737 000340 000006

MOV #340,6

;LEVEL 7

2957 024024 005711

1\$:

TST (R1)

;REFERENCE DEVICE REGISTERS

2958 024026 000240

NOP

2959 024030

ESCAPE TST

2960 024034 062701 000002

ADD #2,R1

;NEXT REGISTER

2961 024040 005305

DEC R5

;DEC REGISTER COUNT

2962 024042 001370

BNE 1\$

;BR IF NOT LAST REGISTER

2963 024044 000415

BR 3\$

2964

2965 024046 062706 000004

2\$:

ADD #4,SP

2966 024052 010137 002362

MOV R1,ADDR

2967 024056 013737 012436 002264

MOV UUT,UNIT

2968 024064

ERRHRD 0,TIM,PADFLT

2969 024074

ESCAPE TST

2970

2971

2972 024100 013737 002254 000004

3\$:

MOV SAVE4,4

2973 024106 013737 002256 000006

MOV SAVE6,6

2974 024114

ESCAPE TST

2975

2976 024120

ENDTST

2977

.EVEN

2978

2979

## HARDWARE TESTS

```

2981 024122      BADHEAD
                ;***** TEST2 *****
2982            ;CHECK PROM REVISION TO SEE IF IT IS COMPATIBLE WITH DIAGNOSTIC
2983 024122      BADHEAD
                ;***** TEST2 *****

2984
2985
2986
2987
2988 024122      STARS 1
2989            ;READ LOCATION 2 OF THE PROM (ADDRESS 160002) WHICH CONTAINS PROM VERSION
2990            :      NUMBER
2991            ;CHECK IF DIAGNOSTIC AND PROM ARE COMPATIBLE AND GIVE AN ERROR IF NOT
2992 024122      STARS 1
2993
2994
2995
2996
2997
2998 024122      BGNTST
2999 024122      004737 014400      JSR      PC,CLRKMV      ;CLEAR ALL REGISTERS
3000 024126      004737 014502      JSR      PC,MAINM1    ;SET MAINT MODE
3001
3002
3003 024132      004537 014730      REVPRO: JSR      R5,READ      ;READ LOCATION 160002
3004 024136      160002              .WORD      160002
3005
3006
3007 024140      023737 012430 012374  CMP      GDREV,BAD    ;LOOK IF COMPATIBLE
3008 024146      001410              BEQ      1$           ;YES
3009
3010 024150              ERRHRD 7,EM0035      ;REPORT THE ERROR
3011 024160      004737 012740      JSR      PC,CHKMAX    ;CHECK IF TOO MANY ERROR
3012 024164
3013 024170
3014 024170      1$:
                ENDTST

```

HARDWARE TESTS

3016  
3017  
3018 024172  
  
3019  
3020 024172  
  
3021  
3022  
3023  
3024  
3025  
3026  
3027 024172  
3028  
3029  
3030  
3031  
3032  
3033  
3034  
3035  
3036  
3037  
3038  
3039  
3040  
3041  
3042  
3043  
3044  
3045  
3046  
3047  
3048  
3049  
3050  
3051  
3052  
3053  
3054  
3055  
3056  
3057  
3058  
3059  
3060  
3061  
3062 024172  
3063  
3064  
3065  
3066  
3067  
3068  
3069  
3070 024172

BADHEAD  
:\*\*\*\*\* TEST3 \*\*\*\*\*  
:REAL TIME CLOCK TEST  
BADHEAD  
:\*\*\*\*\* TEST3 \*\*\*\*\*

STARS 1  
:TEST DESCRIPTION:  
:THIS TEST CHECK KMV11 REAL TIME CLOCK.  
:THE DCT11 FULLY EXECUTE THIS MICRO TEST AND GIVE A TEST RESULT  
:VIA CSR'S TO THE HOST COMPUTER.( TIMING IS CHECKED BY DCT11)  
:  
:  
:DCT11 ENABLE CLOCK,AND THEN SET UP CLOCK FOR 80 MS PERIOD  
:  
:  
:QBUS WAIT FOR AT LEAST 80 MS AND CHECK IF AN INTERRUPT OCCUR  
:ON DCT11 SHIP AT VECTOR 130  
:  
:TURN OF CLOCK, WAIT AGAIN FOR MORE THAN 80 MS AND CHECK THAT NO  
:INTERRUPT OCCUR  
:  
:ERROR REPORTING:           BSELO=200           IF TIMEOUT DURING TEST  
:                            BSELO=100           IF ERROR DURING TEST  
:                            BSELO=TEST NUB   IF NO KMV11 ANSWER  
:                            BSELO=0           IF TEST IS OK  
:  
:IF ERROR                   SEL6=1           IF NO INTERRUPT OCCUR  
:                            SEL6=2           IF BAD VECTOR  
:                            SEL6=4           IF INTERRUPT OCCUR WHEN CLOCK  
:    IS NOT ENABLE  
:                            SEL6=10          INTERRUPT OCCUR TOO EARLY  
:  
:  
:                            SEL2=EXPECTED VECTOR  
:                            SEL4=OBTAINED VECTOR  
:  
:  
: MICRO TEST NB= 27

STARS 1

BGNTST

## HARDWARE TESTS

3071	024172	004737	014400		JSR	PC,CLRKMV		;CLR REG
3072	024176	004737	014502		JSR	PC,MAINM1		;SET MAINT MODE
3073	024202	004537	014552	RTCLK:	JSR	R5,TSTNUB		
3074	024206	000027			.WORD	27		
3075								
3076	024210				WAITB	0,2		;WAIT FOR TEST EXECUTION
3077								
3078								
3079	024230	004737	013102		JSR	PC,TSTERR		;CHECK BSELO
3080	024234	000520			BR	1\$		;TEST OK
3081	024236	000423			BR	2\$		;TIMEOUT ERROR
3082	024240	000432			BR	3\$		;NO KMV ANSWER
3083								
3084								
3085	024242	022777	000001	166212	CMP	#1,@KMVP06		;ERROR DURING TEST ,SEE WHICH ONE
3086	024250	001436			BEQ	4\$		;NO INTERRUPT OCCUR
3087								
3088	024252	022777	000002	166202	CMP	#2,@KMVP06		
3089	024260	001442			BEQ	5\$		;INT ON BAD VECTOR
3090								
3091	024262	022737	000004	012462	CMP	#4,KMVP06		
3092	024270	001452			BEQ	6\$		;INT OCCUR WHEN CLOCK IS DISABLE
3093								
3094								
3095								
3096	024272	022737	000010	012462	CMP	#10,KMVP06		;INTERRUPT OCCUR TOO EARLY
3097	024300	001456			BEQ	7\$		
3098								
3099	024302	000137	024456		JMP	10\$		;WRONG KMV11 ANSWER
3100								
3101								
3102								
3103								
3104	024306				2\$:	ERRHRD	8,EM0006	;TIMEOUT ERROR
3105	024316	004737	012740		JSR	PC,CHKMAX		;CHECK IF TOO MANY ERROR
3106	024322				ESCAPE	TST		
3107								
3108								
3109								
3110	024326				3\$:	ERRHRD	9,EM0004	;NO KMV11 ANSWER
3111	024336	004737	012740		JSR	PC,CHKMAX		;CHECK IF TOO MANY ERROR
3112	024342				ESCAPE	TST		
3113								
3114								
3115	024346				4\$:	ERRHRD	10,EM0011	;NO INTERRUPT OCCUR
3116	024356	004737	012740		JSR	PC,CHKMAX		;CHECK IF TOO MANY ERROR
3117	024362				ESCAPE	TST		
3118								
3119								
3120								
3121	024366	017737	166066	012402	5\$:	MOV	@KMVP04,VECT	;READ BAD VECT
3122	024374	012737	000130	002272	MOV	#130,GOOD		
3123	024402				ERRHRD	11,EM0007,PINTR		;INTERRUPT OCCUR AT A BAD VECTOR
3124	024412				ESCAPE	TST		
3125								
3126								
3127	024416				6\$:	ERRHRD	12,EM0012	;INT OCCUR WHEN CHIP IS DISABLE

## HARDWARE TESTS

3128	024426	004737	012740		JSR PC,CHKMAX		
3129	024432				ESCAPE TST		:CHECK IF TOO MANY ERROR
3130							
3131							
3132							
3133							
3134	024436			7\$:	ERRHRD 13,EM0023		:INTERRUPT OCCURS EARLY
3135	024446	004737	012740		JSR PC,CHKMAX		:CHECK IF TOO MANY ERROR
3136	024452				ESCAPE TST		
3137							
3138							
3139							
3140							
3141							
3142							
3143	024456			10\$:	ERRHRD 14,EM0024		:WRONG KMV11 ANSWER
3144	024466	004737	012740		JSR PC,CHKMAX		:CHECK IF TOO MANY ERROR
3145	024472				ESCAPE TST		
3146							
3147							
3148							
3149							
3150	024476	000240		1\$:	NOP		
3151	024500			ENDTST			
3152							
3153							
3154							

HARDWARE TESTS

3156 024502

```

BADHEAD
:***** TEST4 *****
:BAUD RATE GENERATOR TEST
BADHEAD
:***** TEST4 *****

```

3157  
3158 024502

3159  
3160  
3161  
3162  
3163  
3164  
3165  
3166  
3167 024502

```

STARS 1
:THIS TEST READ THE STATUS AND THE OUTPUT OF THE BAUD RATE GENERATOR
:DURING EACH PHASE OF THE CLOCK PULSE
:
:
:NOTE:THIS TEST AND ALL ITS VERIFICATIONS ARE MADE BY THE DCT11 WHICH
: ONLY GIVE TEST RESULT TO THE HOST VIA CSR'S
: ALL THE TIMING IS CHECKED BY THE DCT11
:
:

```

3170  
3171  
3172  
3173  
3174  
3175  
3176  
3177

```

:TEST DESCRIPTION:
:-DCT11 LOAD GENE COUNT WITH MAX COUNT (=+4.74 MSEC)
:
:-READ BACK GENE COUNT AND STATUS AND CHECK
:

```

3178  
3179  
3180  
3181  
3182  
3183  
3184  
3185  
3186  
3187  
3188  
3189  
3190  
3191

```

STEP 1:READ COUNT AFTER STARTING CLOCK
CLOCK COUNT MUST BE NEGATIVE
OUTPUT MUST BE = 1

```

3192  
3193  
3194  
3195  
3196  
3197  
3198  
3199

```

ERROR REPORTING:
IF COUNT=POSITIVE      BSELO=100=ERROR
                        SEL6 =1  =GENE COUNT CAN'T BE READ OR
                        WRITE CORRECTLY
IF OUTPUT=0            BSELO=100=ERROR
                        SEL6 =2  =GENE OUTPUT ISN'T IN A GOOD
                        STATE(NO ACTION)

```

3200  
3201  
3202  
3203  
3204  
3205

```

STEP 2: WAIT 2.5MSEC AND READ BACK AGAIN GENERATOR COUNT AND STATUS
OUTPUT MUST BE = 0

```

3206  
3207  
3208  
3209  
3210

```

ERROR REPORTING:
IF OUTPUT =1          BSELO=100= ERROR
                      SEL6=10  =OUTPUT ISN'T IN A GOOD STATE

```

```

STEP3:WAIT 2.5 MSEC MORE AND READ BACK AGAIN GENERATOR COUNT AND STATUS

```

HARDWARE TESTS

3211  
3212  
3213  
3214  
3215  
3216  
3217  
3218  
3219  
3220  
3221  
3222  
3223  
3224  
3225  
3226  
3227 024502

:  
: OUTPUT MUST BE = 1  
:  
:  
: ERROR REPORTING:  
: IF OUTPUT=0  
:  
: -ELSE EXIT  
:  
:  
: TEST 30= TEST GENERATOR A  
: TEST 31= TEST GENERATOR B  
STARS 1

BSEL0=100=ERROR  
SEL6=40 =NO ACTION ON GENERATOR OUTPUT





HARDWARE TESTS

3286  
 3287  
 3288 024726  
 3289 024736 004737 012740  
 3290 024742  
 3291  
 3292  
 3293  
 3294 024746  
 3295 024746

GENOUT: ERRHRD 19,EM0014  
 JSR PC,CHKMAX  
 ESCAPE SUB

;NO ACTION ON GENERATOR OUTPUT  
 ;CHECK IF TOO MANY ERROR

BDRKO:  
 ENDSUB

## HARDWARE TESTS

```

3297
3298 024750          BGNSUB
3299 024752 004737 014400      JSR    PC,CLRKMV      ;CLR REG
3300 024756 004737 014502      JSR    PC,MAINM1     ;SET MAINT MODE
3301 024762 004537 014552      JSR    R5,TSTNUB
3302 024766 000031          .WORD   31
3303
3304
3305 024770          WAITB   0.1      ;WAIT FOR TEST EXECUTION
3306
3307 025010 004737 013102      JSR    PC,TSTERR     ;CHECK BSELO TO SEE IF ERROR
3308 025014 000137 025214      JMP    BDROK1        ;TEST OK BR AT END
3309 025020 000402          BR     2$            ;TIME OUT ERROR
3310 025022 000401          BR     2$            ;NO KMV11 ANSWER
3311 025024 000410          BR     3$            ;ERROR DURING TEST
3312
3313
3314
3315 025026          2$:      ERRHRD  20,EM0004      ;NO KMV11 ANSWER
3316 025036 004737 012740      JSR    PC,CHKMAX     ;CHECK IF TOO MANY ERROR
3317 025042          ESCAPE  SUB
3318
3319
3320
3321 025046          3$:      MOV     @KMVP06,SEL6    ;LOOK WHICH ERROR
3322 025046 017737 165410 002326  CMP     #1,SEL6      ;READ SEL6
3323 025054 022737 000001 002326  BNE     4$            ;LOOK IF ERROR 1
3324 025062 001010          ;NO
3325
3326 025064          ERRHRD  21,EM0112    ;GENE COUNT CAN'T BE READ OR WRITE CORRECTLY
3327 025074 004737 012740      JSR    PC,CHKMAX     ;CHECK IF TOO MANY ERROR
3328 025100          ESCAPE  SUB
3329
3330
3331 025104 022737 000002 002326  4$:      CMP     #2,SEL6      ;LOOK IF ERROR 2
3332 025112 001010          BNE     5$            ;NO
3333
3334
3335
3336 025114          ERRHRD  22,EM0113    ;GENE OUTPUT ISN'T IN A GOOD STATE
3337 025124 004737 012740      JSR    PC,CHKMAX     ;CHECK IF TOO MANY ERROR
3338 025130          ESCAPE  SUB
3339
3340
3341
3342 025134 022737 000010 002326  5$:      CMP     #10,SEL6     ;EROR10?
3343 025142 001414          BEQ    GENO
3344 025144 022737 000040 002326  CMP     #40,SEL6
3345 025152 001410          BEQ    GENO
3346
3347 025154          ERRHRD  23,EM0024    ;WRONG KMV11 ANSWER
3348 025164 004737 012740      JSR    PC,CHKMAX     ;CHECK IF TOO MANY ERROR
3349 025170          ESCAPE  SUB
3350
3351
3352
3353

```

E7

HARDWARE TESTS

3354

3355

3356 025174

3357 025204 004737 012740

3358 025210

3359

3360

3361

3362 025214

3363 025214

3364 025216

GENO: ERRHRD 24,EM0014  
JSR PC,CHKMAX  
ESCAPE SUB

;NO ACTION ON GENERATOR OUTPUT  
;CHECK IF TOO MANY ERROR

BDRCK1:  
ENDSUB  
ENDTST

## HARDWARE TESTS

3366 025220

## BADHEAD

```

:***** TESTS *****
:TRANSMIT DIFFERENT FRAMES (OF 500 WORDS) IN INTERNAL
:MODE WITHOUT ANY INTERRUPT ON CHANNEL A
BADHEAD

```

3367

3368

3369 025220

```

:***** TESTS *****

```

3370

3371

3372

3373

3374

3375

3376

3377 025220

## STARS 1

```

:QBUS WRITE DIFFERENT TX TABLE OF 500 WORDS, LOAD IN KMV11 CSR'S
:THE TX AND RX TABLE ADDRESS ,THE TABLE LENGTH AND TRANSFER SPEED

```

3378

3379

3380

3381

3382

3383

```

:DCT11 EXECUTE THE TRANSFER IN INTERNAL MODE ON CHA AND WRITE BACK
:IN RX TABLE (TRANSFER FROM QBUS TO KMV11 =DMA)

```

3384

3385

```

:QBUS CHECK BSEL0 TO SEE THE STATUS OF THE TEST AND IF TEST DONE CHECK IF
:RX TABLE =TX TABLE

```

3386

3387

3388

3389

## :PARAMETERS SELECTION:

3390

3391

3392

3393

3394

3395

3396

3397

3398

3399

```

:SEL2= TX TABLE ADDRESS
:SEL4= TX TABLE LENGTH
:BSEL6= EXTENDED ADDRESS OF TX TABLE
:BSEL7= " " RX "
:SEL12= RX TABLE ADDRESS
:SEL14= SPEED SELECTION
:SEL16= ERROR STATUS
:SEL10= RECEIVED BYTE COUNT DIFFERENCE BETWEEN RX AND TX TABLE
: >0 IF TX>RX,<0 IF TX<RX
:BSEL0= TEST STATUS

```

3400

3401

3402

3403

## :TEST STATUS DESCRIPTION:

3404

3405

3406

3407

3408

3409

3410

3411

## :ERROR STATUS DESCRIPTION:

3412

3413

3414

3415

3416

3417

3418

3419

3420

```

:WHEN BSEL0=100,GIVE CONTAINT OF ERROR STATUS AND WORD COUNT DISCREPANCY

```

```

:SEL16= BIT14=1 =FCS ERROR
:SEL16= BIT13=1 =OVERRUN ERROR
:SEL16= BIT8 =1 =ILLEGAL INTERRUPT ERROR
:SEL16= BIT7 =1 =RX ABORT ERROR
:SEL16= BIT6 =1 =UNDERRUN ERROR

```

HARDWARE TESTS

```

3421      :      SEL16= BIT5 =1 =BYTE COUNT DISCREPANCY
3422      :      SEL16= BIT4 =1 =DMA IN TIMEOUT ERROR
3423      :      SEL16= BIT3 =1 =DMA OUT TIMEOUT ERROR
3424      :      SEL16= BIT2 =1 =CLOCK PROBLEM (NO BUFFER EMPTY)
3425      :      SEL16= BIT1 =1 =DATA COMPARE ERROR BETWEEN TX AND RX TABLE (USE
3426      :                                     ONLY DURING SELF TEST)
3427      :
3428      ;MICRO DIAG TEST DESCRIPTION:
3429      ;TEST 36      =TRANSMIT FRAMES ON CHANNEL A WITHOUT INTERRUPT
3430      :
3431      :
3432 025220 STARS 1

```

## HARDWARE TESTS

```

3434 025220          BGNTST
3435 025220 004737 014400      JSR   PC,CLRKMV      ;CLR REG
3436 025224 005037 002250      CLR   FLAG
3437 025230 004737 014502      JSR   PC,MAINM1     ;SET MAINT MODE
3438 025234 012737 000500 012416  MOV   #500,LENGTH  ;SELECT LENGTH
3439
3440 025242 012737 000174 012414  MOV   #KB56,TSPEED ;SELECT SPEED
3441
3442 025250 012703 000001      INTTX: MOV  #1,R3    ;SELECT A PATTERN
3443
3444
3445 025254 005203      TXSTAR: INC  R3      ;NEW ONE
3446 025256 013704 012416      MOV   LENGTH,R4    ;LOAD LENGTH
3447 025262 012702 002370      MOV   #TTABLE,R2   ;TX TABLE ADDRESS
3448 025266 004737 013160      10$: JSR   PC,GENER  ;WRITE TX TABLE
3449 025272 013722 012400      MOV   DATA,(R2)+
3450 025276 005304      DEC   R4            ;ALL DONE?
3451 025300 001372      BNE   10$
3452
3453
3454
3455 025302 013704 012416      MOV   LENGTH,R4
3456 025306 012702 006370      MOV   #RTABLE,R2   ;CLEAR RX TABLE
3457 025312 005022      11$: CLR  (R2)+
3458 025314 005304      DEC   R4
3459 025316 001375      BNE   11$
3460
3461
3462
3463
3464 025320 013777 012414 165142  MOV   TSPEED,@KMVP14 ;SEND TX SPEED
3465 025326 012777 002370 165122  MOV   #TTABLE,@KMVP02 ;SEND TX TABLE ADDRESS
3466 025334 013777 012416 165116  MOV   LENGTH,@KMVP04  ;LOAD TX TABLE ADDRESS
3467 025342 012777 006370 165116  MOV   #RTABLE,@KMVP12 ;LOAD RX TABLE ADDRESS
3468 025350 005077 165106      CLR   @KMVP06
3469
3470
3471
3472
3473
3474
3475 025354 004537 014552      JSR   R5,TSTNUB
3476 025360 000036      .WORD 36            ;DO TEST 36= CHA TEST
3477
3478
3479
3480 025362      2$: WAITB 0.2      ;WAIT FOR TEST EXECUTION
3481
3482
3483 025402 004737 013102      JSR   PC,TSTERR     ;CHECK BSELO
3484
3485 025406 000427      BR   6$             ;TEST OK CHECK RX TABLE
3486 025410 000402      BR   3$             ;TIMEOUT ERROR
3487 025412 000401      BR   3$             ;NO KMV11 ANSWER
3488 025414 000410      BR   4$             ;CHECK SEL16 TO SEE WHICH ONE
3489
3490

```



HARDWARE TESTS

3548	025602			74:	ERRHRD	27,0,PRAMEF		:SHORT REPORT
3549	025612	005237	002250		INC	FLAG		
3550	025616	062702	000002		ADD	#2,R2		
3551	025622	062705	000002		ADD	#2,R5		:POINT NEXT ADDRESS
3552	025626	022737	000010	002250	CMP	#10,FLAG		:LOOK IF 10 REPORT
3553	025634	001322			BNE	RXCK		
3554								
3555	025636				ESCAPE	TST		
3556								
3557								
3558	025642			RXEND:				
3559								
3560								
3561								
3562	025642			ENDTST				



HARDWARE TESTS

3564 025644

BADHEAD

\*\*\*\*\* TEST6 \*\*\*\*\*  
;TRANSMIT DIFFERENT FRAMES (OF 500 WORDS) IN INTERNAL  
;MODE WITHOUT ANY INTERRUPT ON CHANNEL B

3565

3566

3567 025644

BADHEAD

\*\*\*\*\* TEST6 \*\*\*\*\*

3568

3569

3570

3571

3572

3573

3574

3575 025644

STARS 1

;QBUS WRITE DIFFERENT TX TABLE OF 500 WORDS, LOAD IN KMV11 CSR'S  
;THE TX AND RX TABLE ADDRESS ,THE TABLE LENGTH AND TRANSFER SPEED

3576

3577

3578

3579

3580

3581

3582

3583

3584

3585

3586

3587

3588

3589

3590

3591

3592

3593

3594

3595

3596

3597

3598

3599

3600

3601

3602

3603

3604

3605

3606

3607

3608

3609

3610

3611

3612

3613

3614

3615

3616

3617

3618

;DCT11 EXECUTE THE TRANSFER IN INTERNAL MODE ON CHB AND WRITE BACK  
;IN RX TABLE (TRANSFER FROM QBUS TO KMV11 =DMA)

;QBUS CHECK BSEL0 TO SEE THE STATUS OF THE TEST AND IF TEST DONE CHECK IF  
;RX TABLE =TX TABLE

;PARAMETERS SELECTION:

; SEL2= TX TABLE ADDRESS  
; SEL4= TX TABLE LENGTH  
; BSEL6= EXTENDED ADDRESS OF TX TABLE  
; BSEL7= " " RX "  
; SEL12= RX TABLE ADDRESS  
; SEL14= SPEED SELECTION  
; SEL16= ERROR STATUS  
; SEL10= RECEIVED BYTE COUNT DIFFERENCE BETWEEN RX AND TX TABLE  
; >0 IF TX>RX,<0 IF TX<RX  
; BSEL0= TEST STATUS

;TEST STATUS DESCRIPTION:

; BSEL0= 0 =TEST DONE CHECK RX TABLE  
; BSEL0= 200 =TIMEOUT ERROR  
; BSEL0= TSTNB =NO KMV11 ANSWER  
; BSEL0= 100 =ERROR DURING TEST ,LOOK WHICH ONE BY TESTING BSEL16

;ERROR STATUS DESCRIPTION:

; WHEN BSEL0=100,GIVE CONTAINT OF ERROR STATUS AND WORD COUNT DISCREPANCY

; SEL16= BIT14=1 =FCS ERROR  
; SEL16= BIT13=1 =OVERRUN ERROR  
; SEL16= BIT8 =1 =ILLEGAL INTERRUPT ERROR  
; SEL16= BIT7 =1 =RX ABORT ERROR  
; SEL16= BIT6 =1 =UNDERRUN ERROR

HARDWARE TESTS

```
3619      :      SEL16= BIT5 =1 =BYTE COUNT DISCREPANCY
3620      :      SEL16= BIT4 =1 =DMA IN TIMEOUT ERROR
3621      :      SEL16= BIT3 =1 =DMA OUT TIMEOUT ERROR
3622      :      SEL16= BIT2 =1 =CLOCK PROBLEM (NO BUFFER EMPTY)
3623      :      SEL16= BIT1 =1 =DATA COMPARE ERROR BETWEEN TX AND RX TABLE (USE
3624      :                                     ONLY DURING SELF TEST)
3625      :
3626      :MICRO DIAG TEST DESCRIPTION:
3627      :TEST 37      =TRANSMIT FRAMES ON CHANNEL B WITHOUT INTERRUPT
3628      :
3629      :
3630 025644 STARS 1
```

## HARDWARE TESTS

3632	025644				BGNTST				
3633	025644	004737	014400			JSR	PC,CLRKMV		;CLR REG
3634	025650	005037	002250			CLR	FLAG		
3635	025654	004737	014502			JSR	PC,MAINM1		;SET MAINT MODE
3636	025660	012737	000500	012416		MOV	#500,LENGTH		;SELECT LENGTH
3637									
3638	025666	012737	000174	012414		MOV	#KB56,TSPEED		;SELECT SPEED
3639									
3640	025674	012703	000001			MOV	#1,R3		;SELECT A PATTERN
3641									
3642									
3643	025700	005203			BTXSTA:	INC	R3		;NEW ONE
3644	025702	013704	012416			MOV	LENGTH,R4		;LOAD LENGTH
3645	025706	012702	002370			MOV	#TABLE,R2		;TX TABLE ADDRESS
3646	025712	004737	013160		10\$:	JSR	PC,GENER		;WRITE TX TABLE
3647	025716	013722	012400			MOV	DATA,(R2)+		
3648	025722	005304				DEC	R4		;ALL DONE?
3649	025724	001372				BNE	10\$		
3650									
3651									
3652									
3653	025726	013704	012416			MOV	LENGTH,R4		
3654	025732	012702	006370		11\$:	MOV	#RTABLE,R2		;CLEAR RX TABLE
3655	025736	005022				CLR	(R2)+		
3656	025740	005304				DEC	R4		
3657	025742	001375				BNE	11\$		
3658									
3659									
3660									
3661									
3662	025744	013777	012414	164516		MOV	TSPEED,@KMVP14		;SEND TX SPEED
3663	025752	012777	002370	164476		MOV	#TABLE,@KMVP02		;SEND TX TABLE ADDRESS
3664	025760	013777	012416	164472		MOV	LENGTH,@KMVP04		;LOAD TX TABLE ADDRESS
3665	025766	012777	006370	164472		MOV	#RTABLE,@KMVP12		;LOAD RX TABLE ADDRESS
3666	025774	005077	164462			CLR	@KMVP06		
3667									
3668									
3669									
3670									
3671									
3672	026000	004537	014552		1\$:	JSR	R5,TSTNUB		
3673	026004	000037				.WORD	37		;DO TEST 37= CHB TEST
3674									
3675									
3676									
3677	026006				2\$:	WAITB	0,2		;WAIT FOR TEST EXECUTION
3678									
3679									
3680	026026	004737	013102			JSR	PC,TSTERR		;CHECK BSELO
3681									
3682	026032	000427				BR	6\$		;TEST OK CHECK RX TABLE
3683	026034	000402				BR	3\$		;TIMEOUT ERROR
3684	026036	000401				BR	3\$		;NO KMV11 ANSWER
3685	026040	000410				BR	4\$		;CHECK SEL16 TO SEE WHICH ONE
3686									
3687									
3688	026042				3\$:	ERRHRD	25,EM0004		;NO KMV11 ANSWER

## HARDWARE TESTS

3689	026052	004737	012740		JSR	PC,CHKMAX		;CHECK IF TOO MANY ERROR
3690	026056				ESCAPE	TST		
3691								
3692								
3693								
3694	026062			4\$:				;ERROR DURING TEST READ ERROR STATUS
3695								;TO CHECK WHICH ONE.
3696								
3697	026062	017737	164404	012424	MOV	@KMVP16,STAERR		;READ ERROR STATUS
3698								
3699	026070	017737	164370	012426	MOV	@KMVP10,WRDCNT		;READ WORD COUNT DISCREPANCY
3700								
3701	026076				ERRHRD	26,EM0115,PRSTER		;ERROR WHILE TX,RX FRAMES,GIVE ERROR
3702								;GIVE ERROR STATUS,WORD CNT DISCREPANCY
3703	026106				ESCAPE	TST		
3704								
3705								
3706								
3707								
3708								
3709	026112	012702	002370	6\$:	MOV	#TTABLE,R2		;LOAD TXTABLE ADDRESS
3710	026116	012705	006370		MOV	#RTABLE,R5		; " RXTABLE ADDRESS
3711	026122	013704	012416		MOV	LENGTH,R4		;TABLE LENGTH
3712								
3713	026126	022225			BRXCK:	(R2)+,(R5)+		;CHECK RX AND TX TABLE
3714	026130	001007			BNE	BRXERR		
3715	026132	005304			DEC	#4		;ALL CHECK?
3716	026134	001374			BNE	BRXCK		;NO BRANCH
3717								
3718								
3719								
3720	026136	022703	000004		CMP	#4,R3		;ALL KIND OF PATTERN DONE?
3721	026142	001256			BNE	BTXSTA		;NO TRY WITH NEW ONE
3722								
3723								
3724								
3725	026144	000137	026266		JMP	BRXEND		
3726								
3727	026150	162705	000002		BRXERR:	SUB #2,R5		
3728	026154	162702	000002		SUB	#2,R2		
3729								
3730	026160	011237	012410		MOV	(R2),TXDATA		
3731	026164	011537	012412		MOV	(R5),RXDATA		
3732								
3733	026170	005737	002250		TST	FLAG		;LOOK IF 1ST ERROR
3734	026174	001014			BNE	7\$		
3735								
3736	026176				ERRHRD	27,EM0115,PFRAME		;DATA CMP ERROR
3737	026206	005237	002250		INC	FLAG		
3738	026212	062702	000002		ADD	#2,R2		;POINT NEXT ADDRESS
3739	026216	062705	000002		ADD	#2,R5		
3740	026222	000137	025502		JMP	RXCK		
3741								
3742	026226			7\$:	ERRHRD	27,0,PRAMEF		;SHORT REPORT
3743	026236	005237	002250		INC	FLAG		
3744	026242	062702	000002		ADD	#2,R2		
3745	026246	062705	000002		ADD	#2,R5		;POINT NEXT ADDRESS

HARDWARE TESTS

3746	026252	022737	000010	002250	CMP	#10,FLAG	;LOOK IF 10 REPORT
3747	026260	001322			BNE	BRXCK	
3748							
3749	026262				ESCAPE	TST	
3750							
3751							
3752	026266				BRXEND:		
3753							
3754							
3755							
3756	026266				ENDTST		

## HARDWARE TESTS

3758  
3759  
3760  
3761 026270

## BADHEAD

```

***** TEST7 *****
;TRANSMIT DIFFERENT FRAME OF VARIOUS LENGTH (FROM 2BYTES TO 2K BYTES)
;AT 56KBAUDS IN INTERNAL MODE ON CHANNEL A (TRANSMISSION WITH INTERRUPT)
BADHEAD
***** TEST7 *****

```

3762  
3763  
3764 026270

3765  
3766  
3767  
3768  
3769  
3770  
3771  
3772 026270

## STARS 1

```

;QBUS WRITE DIFFERENT TX TABLE OF VARIOUS LENGTH, LOAD IN KMV11 CSR'S
;THE TX AND RX TABLE ADDRESS ,THE TABLE LENGTH AND TRANSFER SPEED
;
;
;DCT11 EXECUTE THE TRANSFER IN INTERNAL MODE ON CMA AND WRITE BACK
;IN RX TABLE
;QBUS CHECK BSELO TO SEE THE STATUS OF THE TEST AND IF TEST DONE CHECK IF
;RX TABLE =TX TABLE
;SPEED=56KBAUDS

```

3773  
3774  
3775  
3776  
3777  
3778  
3779  
3780  
3781  
3782  
3783  
3784  
3785  
3786  
3787  
3788  
3789  
3790  
3791  
3792  
3793  
3794  
3795  
3796  
3797

## ;PARAMETERS SELECTION:

```

;SEL2= TX TABLE ADDRESS
;SEL4= TX TABLE LENGTH
;BSEL6= EXTENDED ADDRESS OF TX TABLE
;BSEL7= " " RX "
;SEL12= RX TABLE ADDRESS
;SEL14= SPEED SELECTION
;SEL16= ERROR STATUS
;BSELO= TEST STATUS

```

3798  
3799  
3800  
3801  
3802  
3803  
3804

## ;TEST STATUS DESCRIPTION:

```

;BSELO= 0 -TEST DONE CHECK RX TABLE
;BSELO= 200 -TIMEOUT ERROR
;BSELO= TSTNB -NO KMV11 ANSWER
;BSELO= 100 -ERROR DURING TEST ,LOOK WHICH ONE BY TESTING BSEL16

```

3805  
3806  
3807  
3808  
3809  
3810  
3811  
3812

## ;ERROR STATUS DESCRIPTION:

```

;WHEN BSELO=100,GIVE CONTAINT OF ERROR STATUS AND WORD COUNT DISCREPANCY
;
;SEL16= BIT14=1 -FCS ERROR
;SEL16= BIT13=1 -OVERRUN ERROR
;SEL16= BIT8 =1 -ILLEGAL INTERRUPT ERROR

```

HARDWARE TESTS

```

3813      :      SEL16= BIT7 =1 =RX ABORT ERROR
3814      :      SEL16= BIT6 =1 =UNDERRUN ERROR
3815      :      SEL16= BIT5 =1 =WORD COUNT DISCREPANCY
3816      :      SEL16= BIT4 =1 =DMA IN TIMEOUT ERROR
3817      :      SEL16= BIT3 =1 =DMA OUT TIMEOUT ERROR
3818      :      SEL16= BIT2 =1 =CLOCK PROBLEM (NO BUFFER EMPTY)
3819      :      SEL16= BIT1 =1 =DATA COMPARE ERROR BETWEEN TX AND RX TABLE (USE
3820      :                                     ONLY DURING SELF TEST)
3821      :
3822      :
3823      :MICRO DIAG TEST DESCRIPTION:
3824      :TEST 40      =TRANSMIT VARIOUS LENGTH FRAME AT 56 KBAUDS ON CHANNEL A
3825      :
3826      :
3827 026270 STARS 1

```

## HARDWARE TESTS

```

3829 026270          BGNTST
3830 026270 004737 014400      JSR    PC,CLRKMV      ;CLR REG
3831 026274 004737 014502      JSR    PC,MAINM1     ;SET MAINT MODE
3832 026300 005037 002250      CLR    FLAG
3833
3834
3835 026304 012703 000004          MOV    #4,R3          ;SELECT RANDOM PATTERN
3836 026310 012737 000174 012414  MOV    #KB56,TSPEED  ;SELECT SPEED
3837
3838 026316 012737 000001 012416  TXLTAR: MOV    #1,LENGTH  ;START WITH 2 CHARACTERS
3839
3840 026324 013704 012416          TXLBGN: MOV    LENGTH,R4
3841 026330 012702 002370          MOV    #RTABLE,R2
3842 026334          BREAK
3843 026336 004737 013160          10$:  JSR    PC,GENER      ;WRITE TX TABLE
3844 026342 013722 012400          MOV    DATA,(R2)+
3845 026346 005304          DEC    R4
3846 026350 001372          BNE    10$
3847
3848
3849 026352 013704 012416          MOV    LENGTH,R4          ;CLEAR RX TABLE
3850 026356 012702 006370          MOV    #RTABLE,R2
3851 026362 005022          20$:  CLR    (R2)+
3852 026364 005304          DEC    R4
3853 026366 001375          BNE    20$
3854
3855
3856
3857
3858
3859
3860 026370 013777 012414 164072  MOV    TSPEED,@KMVP14  ;SEND TX SPEED
3861 026376 012777 002370 164052  MOV    #RTABLE,@KMVP02 ; " TX TABLE ADDRESS
3862 026404 013777 012416 164046  MOV    LENGTH,@KMVP04  ; " " " LENGTH
3863 026412 012777 006370 164046  MOV    #RTABLE,@KMVP12 ;SEND RX TABLE ADDRESS
3864 026420 005077 164036  CLR    @KMVP06         ;CLR EXTENDED ADDRESS
3865
3866
3867
3868
3869 026424 004537 014552          JSR    R5,TSTNUB
3870 026430 000040          .WORD 40              ;DO TEST 40= CHA TEST
3871
3872
3873
3874 026432          2$:  WAITB 0,2            ;WAIT FOR TEST EXECUTION
3875
3876
3877 026452 004737 013102          JSR    PC,TSTERR      ;CHECK BSELO
3878
3879 026456 000427          BR    6$              ;TEST OK CHECK RX TABLE
3880 026460 000402          BR    3$              ;TIMEOUT ERROR
3881 026462 000401          BR    3$              ;NO KMV11 ANSWER
3882 026464 000410          BR    4$              ;CHECK SEL16 TO SEE WHICH ONE
3883
3884
3885 026466          3$:  ERRHRD 28,EM0004  ;NO KMV11 ANSWER

```



## HARDWARE TESTS

```

3886 026476 004737 012740      JSR     PC,CHKMAX      ;CHECK IF TOO MANY ERROR
3887 026502      ESCAPE  TST
3888
3889 026506      4$:      ;ERROR DURING TEST READ ERROR STATUS
3890      ;TO CHECK WHICH ONE
3891
3892 026506 017737 163760 012424      MOV     @KMVP16,STAERR ;READ ERROR STATUS
3893
3894 026514 017737 163744 012426      MOV     @KMVP10,WRDCNT ;READ WORD COUNT DISCREPANCY
3895
3896 026522      ERRHRD 29,EH0016,PRS1ER ;ERROR WHILE TX,RX FRAMES,GIVE ERROR
3897      ;GIVE ERROR STATUS,WORD CNT DISCREPANCY
3898 026532      ESCAPE  TST
3899
3900
3901
3902
3903 026536 012702 002370      6$:      MOV     @TTABLE,R2      ;LOAD TX TABLE ADDRESS
3904 026542 012705 006370      MOV     @RTABLE,R5      ; "   RX   "   "
3905 026546 013704 012416      MOV     LENGTH,R4      ; "   TX TABLE LENGTH
3906
3907
3908 026552 022522      RXLCK:  CMP     (R5)+,(R2)+   ;CMP TX AND RX TABLE
3909 026554 001015      BNE     RXLERR          ;BR IF ERROR
3910 026556 005304      DEC     R4              ;ALL DONE
3911 026560 001374      BNE     RXLCK          ;NO
3912
3913 026562 062737 000400 012416      ADD     @400,LENGTH     ;CHANGE LENGTH
3914 026570 022737 002000 012416      CMP     @2000,LENGTH    ;IS IT MAX?
3915 026576 100252      BPL     TXLBGN         ;NO DO TEST AGAIN WITH NEW TABLE
3916      ;                               LENGTH
3917
3918 026600 005303      DEC     R3              ;SELECT OTHER PATERNS
3919 026602 001245      BNE     TXLTAR
3920
3921 026604 000137 026726      JMP     RXLEND
3922
3923
3924
3925 026610 162705 000002      RXLERR: SUB     @2,R5
3926 026614 162702 000002      SUB     @2,R2
3927
3928 026620 011237 012410      MOV     (R2),TXDATA
3929 026624 011537 012412      MOV     (R5),RXDATA
3930
3931 026630 005737 002250      TST     FLAG           ;LOOK IF 1ST ERROR
3932 026634 001014      BNE     30$
3933
3934 026636      ERRHRD 30,EM0016,PFRAME ;DATA CMP ERROR
3935 026646 005237 002250      INC     FLAG
3936 026652 062702 000002      ADD     @2,R2          ;POINT NEXT ADDRESS
3937 026656 062705 000002      ADD     @2,R5
3938 026662 000137 025502      JMP     RXCK
3939
3940 026666      30$:      ERRHRD 30,0,PRAMEF     ;SHORT REPORT
3941 026676 005237 002250      INC     FLAG
3942 026702 062702 000002      ADD     @2,R2

```

HARDWARE TESTS

3943	026706	062705	000002		ADD	#2,R5		;POINT NEXT ADDRESS
3944	026712	022737	000010	002250	CMP	#10,FLAG		;LOOK IF 10 REPORT
3945	026720	001314			BNE	RXLCK		
3946								
3947	026722				ESCAPE	TST		
3948								
3949								
3950								
3951								
3952	026726				RXLEND:			
3953	026726				ENDTST			

## HARDWARE TESTS

```

3956
3957
3958
3959 026730      BADHEAD
                  :***** TEST8 *****
3960              :TRANSMIT DIFFERENT FRAME OF VARIOUS LENGTH (FROM 2BYTES TO 2K BYTES)
3961              :AT 56KBAUDS IN INTERNAL MODE ON CHANNEL B (TRANSMISSION WITH INTERRUPT)
3962 026730      BADHEAD
                  :***** TEST8 *****

3963
3964
3965
3966
3967
3968
3969
3970 026730      STARS 1
3971              :QBUS WRITE DIFFERENT TX TABLE OF VARIOUS LENGTH, LOAD IN KMV11 CSR'S
3972              :THE TX AND RX TABLE ADDRESS ,THE TABLE LENGTH AND TRANSFER SPEED
3973              :
3974              :
3975              :
3976              :DCT11 EXECUTE THE TRANSFER IN INTERNAL MODE ON CHA AND CHB AND WRITE BACK
3977              :IN RX TABLE
3978              :QBUS CHECK BSELO TO SEE THE STATUS OF THE TEST AND IF TEST DONE CHECK IF
3979              :RX TABLE =TX TABLE
3980              :SPEED=56KBAUDS
3981              :
3982              :
3983              :PARAMETERS SELECTION:
3984              :      SEL2= TX TABLE ADDRESS
3985              :      SEL4= TX TABLE LENGTH
3986              :      BSEL6= EXTENDED ADDRESS OF TX TABLE
3987              :      BSEL7= " " RX "
3988              :      SEL12= RX TABLE ADDRESS
3989              :      SEL14= SPEED SELECTION
3990              :      SEL16= ERROR STATUS
3991              :      BSELO= TEST STATUS
3992              :
3993              :
3994              :
3995              :TEST STATUS DESCRIPTION:
3996              :      BSELO= 0      =TEST DONE CHECK RX TABLE
3997              :      BSELO= 200    =TIMEOUT ERROR
3998              :      BSELO= TSTNB  =NO KMV11 ANSWER
3999              :      BSELO= 100   =ERROR DURING TEST ,LOOK WHICH ONE BY TESTING BSEL16
4000              :
4001              :
4002              :
4003              :ERROR STATUS DESCRIPTION:
4004              :
4005              :      WHEN BSELO=100,GIVE CONTAINIT OF ERROR STATUS AND WORD COUNT DISCREPANCY
4006              :
4007              :
4008              :      SEL16= BIT14=1 =FCS ERROR
4009              :      SEL16= BIT13=1 =OVERRUN ERROR
4010              :      SEL16= BIT8 =1 =ILLEGAL INTERRUPT ERROR

```

HARDWARE TESTS

```

4011      :      SEL16= BIT7 =1 =RX ABORT ERROR
4012      :      SEL16= BIT6 =1 =UNDERRUN ERROR
4013      :      SEL16= BIT5 =1 =WORD COUNT DISCREPANCY
4014      :      SEL16= BIT4 =1 =DMA IN TIMEOUT ERROR
4015      :      SEL16= BIT3 =1 =DMA OUT TIMEOUT ERROR
4016      :      SEL16= BIT2 =1 =CLOCK PROBLEM (NO BUFFER EMPTY)
4017      :      SEL16= BIT1 =1 =DATA COMPARE ERROR BETWEEN TX AND RX TABLE (USED
4018      :                                     ONLY DURING SELF TEST)
4019      :
4020      :
4021      :MICRO DIAG TEST DESCRIPTION:
4022      :TEST 41      =TRANSMIT VARIOUS LENGTH FRAME  AT 56 KBAUDS ON CHANNEL B
4023      :
4024      :
4025 026730 STARS 1

```

HARDWARE TESTS

```

4027 026730          BGNTST
4028 026730 004737 014400      JSR      PC,CLRKMV      ;CLR REG
4029 026734 004737 014502      JSR      PC,MAINM1     ;SET MAINT MODE
4030 026740 005037 002250      CLR      FLAG
4031
4032
4033 026744 012703 000004      MOV      #4,R3         ;SELECT RANDOM PATTERN
4034 026750 012737 000174 012414  MOV      #KB56,TSPEED  ;SELECT SPEED
4035
4036 026756 012737 000001 012416  BXL TAR: MOV      #1,LENGTH  ;START WITH 2 CHARACTERS
4037
4038 026764 013704 012416      BXL BGN: MOV      LENGTH,R4
4039 026770 012702 002370      MOV      #RTABLE,R2
4040 026774          BREAK
4041 026776 004737 013160      10$:   JSR      PC,GENER     ;WRITE TX TABLE
4042 027002 013722 012400      MOV      DATA,(R2)+
4043 027006 005304          DEC      R4
4044 027010 001372          BNE     10$
4045
4046
4047 027012 013704 012416      MOV      LENGTH,R4     ;CLEAR RX TABLE
4048 027016 012702 006370      MOV      #RTABLE,R2
4049 027022 005022          20$:   CLR      (R2)+
4050 027024 005304          DEC      R4
4051 027026 001375          BNE     20$
4052
4053
4054
4055
4056
4057
4058 027030 013777 012414 163432  MOV      TSPEED,@KMVP14  ;SEND TX SPEED
4059 027036 012777 002370 163412  MOV      #RTABLE,@KMVP02 ; " TX TABLE ADDRESS
4060 027044 013777 012416 163406  MOV      LENGTH,@KMVP04  ; " " " LENGTH
4061 027052 012777 006370 163406  MOV      #RTABLE,@KMVP12 ;SEND RX TABLE ADDRESS
4062 027060 005077 163376      CLR      @KMVP06       ;CLR EXTENDED ADDRESS
4063
4064
4065
4066 027064 004537 014552      JSR      R5,TSTNUB
4067 027070 000041          .WORD   41             ;DO TEST 41= CHB TEST
4068
4069
4070 027072          2$:   WAITB   0,2           ;WAIT FOR TEST EXECUTION
4071
4072
4073 027112 004737 013102      JSR      PC,TSTERR     ;CHECK BSELO
4074
4075 027116 000427          BR      6$             ;TEST OK CHECK RX TABLE
4076 027120 000402          BR      3$             ;TIMEOUT ERROR
4077 027122 000401          BR      3$             ;NO KMV11 ANSWER
4078 027124 000410          BR      4$             ;CHECK SEL16 TO SEE WHICH ONE
4079
4080
4081 027126          3$:   ERRHRD  28,EM0004  ;NO KMV11 ANSWER
4082 027136 004737 012740      JSR      PC,CHKMAX     ;CHECK IF TOO MANY ERROR
4083 027142          ESCAPE  TST

```

## HARDWARE TESTS

4084											
4085	027146				4\$:						:ERROR DURING TEST READ ERROR STATUS
4086											:TO CHECK WHICH ONE
4087											
4088	027146	017737	163320	012424		MOV	@KMVP16,STAERR				:READ ERROR STATUS
4089											
4090	027154	017737	163304	012426		MOV	@KMVP10,WRDCNT				:READ WORD COUNT DISCREPANCY
4091											
4092	027162					ERRHRD	29,EM0116,PRSTER				:ERROR WHILE TX,RX FRAMES,GIVE ERROR
4093											:GIVE ERROR STATUS,WORD CNT DISCREPANCY
4094	027172					ESCAPE	TST				
4095											
4096											
4097											
4098											
4099	027176	012702	002370		6\$:	MOV	@TTABLE,R2				:LOAD TX TABLE ADDRESS
4100	027202	012705	006370			MOV	@RTABLE,R5				: " RX " "
4101	027206	013704	012416			MOV	LENGTH,R4				: " TX TABLE LENGTH
4102											
4103											
4104	027212	022522			BXLCK:	CMP	(R5)+,(R2)+				:CMP TX AND RX TABLE
4105	027214	001015				BNE	BXLERR				:BR IF ERROR
4106	027216	005304				DEC	R4				:ALL DONE
4107	027220	001374				BNE	BXLCK				:NO
4108											
4109	027222	062737	000400	012416		ADD	@400,LENGTH				:CHANGE LENGTH
4110	027230	022737	002000	012416		CMP	@2000,LENGTH				:IS IT MAX?
4111	027236	100252				BPL	BXLBGN				:NO DO TEST AGAIN WITH NEW TABLE
4112											LENGTH
4113											
4114	027240	005303				DEC	R3				:SELECT OTHER PATERNS
4115	027242	001245				BNE	BXLTR				
4116											
4117	027244	000137	027366			JMP	BXLEND				
4118											
4119											
4120											
4121	027250	162705	000002		BXLERR:	SUB	@2,R5				
4122	027254	162702	000002			SUB	@2,R2				
4123											
4124	027260	011237	012410			MOV	(R2),TXDATA				
4125	027264	011537	012412			MOV	(R5),RXDATA				
4126											
4127	027270	005737	002250			TST	FLAG				:LOOK IF 1ST ERROR
4128	027274	001014				BNE	30\$				
4129											
4130	027276					ERRHRD	30,EM0116,PFRAME				:DATA CMP ERROR
4131	027306	005237	002250			INC	FLAG				
4132	027312	062702	000002			ADD	@2,R2				:POINT NEXT ADDRESS
4133	027316	062705	000002			ADD	@2,R5				
4134	027322	000137	000000G			JMP	BXCK				
4135											
4136	027326				30\$:	ERRHRD	30,0,PRAMEF				:SHORT REPORT
4137	027336	005237	002250			INC	FLAG				
4138	027342	062702	000002			ADD	@2,R2				
4139	027346	062705	000002			ADD	@2,R5				:POINT NEXT ADDRESS
4140	027352	022737	000010	002250		CMP	@10,FLAG				:LOOK IF 10 REPORT

HARDWARE TESTS

4141 027360 001314  
4142  
4143 027362  
4144  
4145  
4146  
4147  
4148 027366  
4149 027366

BNE BXLCK  
ESCAPE TST

BXLEND:  
ENDTST

## HARDWARE TESTS

```

4151
4152 027370      BADHEAD
                  ;***** TEST9 *****
4153              ;TRANSMIT DIFFERENT FRAMES OF VARIOUS LENGTH IN EXTERNAL LOOP BACK
4154              ;MODE ON CHANNEL A
4155 027370      BADHEAD
                  ;***** TEST9 *****

4156
4157
4158
4159
4160
4161
4162 027370      STARS 1
4163              ;
4164              ;AT BEGINNING OF TEST ,CHECK IF LOOP BACK CONNECTORS ARE INSTALLED
4165              ;OR NOT:IF NOT INSTALLED = EXIT TEST AND GIVE ERROR MESSAGE
4166              ;*****
4167              ;
4168              ;
4169              ;
4170              ;
4171              ;
4172              ;QBUS WRITE DIFFERENT TX TABLE OF VARIOUS LENGTH, LOAD IN KMV11 CSR'S
4173              ;THE TX AND RX TABLE ADDRESS ,THE TABLE LENGTH AND TRANSFER SPEED (56KB)
4174              ;
4175              ;
4176              ;
4177              ;DCT11 EXECUTE THE TRANSFER IN EXTERNAL MODE ON CHA  AND WRITE BACK
4178              ;IN RX TABLE
4179              ;QBUS CHECK BSELO TO SEE THE STATUS OF THE TEST AND IF TEST DONE CHECK IF
4180              ;RX TABLE =TX TABLE
4181              ;
4182              ;
4183              ;PARAMETERS SELECTION:
4184              ;      SEL2=   TX TABLE ADDRESS
4185              ;      SEL4=   TX TABLE LENGTH
4186              ;      BSEL6=  EXTENDED ADDRESS OF TX TABLE
4187              ;      BSEL7=  "           "           RX           "
4188              ;      SEL12=  RX TABLE ADDRESS
4189              ;      SEL14=  SPEED SELECTION
4190              ;      SEL16=  ERROR STATUS
4191              ;      BSELO=  TEST STATUS
4192              ;      SEL10=  RECEIVED BYTE COUNT          DIFFERENCE BETWEEN RX AND TX TABLE
4193              ;                                     >0 IF TX>RX,<0 IF TX<RX
4194              ;
4195              ;
4196              ;
4197              ;TEST STATUS DESCRIPTION:
4198              ;      BSELO=  0           =TEST DONE CHECK RX TABLE
4199              ;      BSELO=  200        =TIMEOUT ERROR
4200              ;      BSELO=  TSTNB     =NO KMV11 ANSWER
4201              ;      BSELO=  100       =ERROR DURING TEST ,LOOK WHICH ONE BY TESTING BSEL16
4202              ;
4203              ;
4204              ;
4205              ;ERROR STATUS DESCRIPTION:

```



## HARDWARE TESTS

```

4206      :
4207      :           WHEN BSELO=100,GIVE CONTAINIT OF ERROR STATUS AND WORD COUNT DISCREPANCY
4208      :
4209      :
4210      :           SEL16= BIT14=1 =FCS ERROR
4211      :           SEL16= BIT13=1 =OVERRUN ERROR
4212      :           SEL16= BIT8 =1 =ILLEGAL INTERRUPT ERROR
4213      :           SEL16= BIT7 =1 =RX ABORT ERROR
4214      :           SEL16= BIT6 =1 =UNDERRUN ERROR
4215      :           SEL16= BIT5 =1 =WORD COUNT DISCREPANCY
4216      :           SEL16= BIT4 =1 =DMA IN TIMEOUT ERROR
4217      :           SEL16= BIT3 =1 =DMA OUT TIMEOUT ERROR
4218      :           SEL16= BIT2 =1 =CLOCK PROBLEM
4219      :           SEL16= BIT1 =1 =DATA COMPARE ERROR BETWEEN TX AND RX TABLE (USE
4220      :                               ONLY DURING SELF TEST)
4221      :
4222      :
4223      :MICRO DIAG TEST DESCRIPTION:
4224      :TEST 42           =TRANSMIT VARIOUS LENGTH FRAME AT 56 KBAUDS SPEED ON CHANNEL A
4225      :                               IN EXTERNAL LOOP BACK MODE
4226      :
4227      :
4228      :
4229      :
4230      :CAUTION:
4231      :-----
4232      :RUN ONLY WITH EXTERNAL LOOP BACK CONNECTOR:
4233      :
4234      :
4235      :NOTE:FOR KMV11-B BOTH CONNECTORS MUST BEINSTALLED
4236      :
4237      :TO BE FULLY TESTED ,KMV11 DIAGNOSTIC MUST BE RUN WITH RS422 AND RS423
4238      :EXTERNAL LOOP BACK CONECTOR
4239      :
4240      :
4241      :
4242      :FOR RS422 PLUG LOOP BACK CONNECTOR 2P-E155A-00 AT THE END OF 2P-E14UA-00
4243      :MODEM CABLE.
4244      :
4245      :FOR RS423 PLUG LOOP BACK CONNECTOR H325 AT THE END OF 2P-E14VA-00
4246      :MODEM CABLE.
4247      :
4248 027370 STARS 1

```

## HARDWARE TESTS

4250	027370				BGNTST				
4251	027370	004737	014400		JSR	PC,CLRKMV			;CLEAR REGISTERS
4252	027374	004737	014600		JSR	PC,CKKMV			;LOOK IF LOOP BACK CON INSTALLED?
4253	027400	005737	012474		TST	LOOP			;IS LOOP BIT=1?
4254	027404	001412			BEQ	BGNTXA			;YES GO ON TEST
4255	027406				PRINTF	@MLOOP			;NO LOOP BACK PLUGGED .THE MODULE
4256									;WILL NOT BE TESTED IS EXTERNAL LOOP
4257	027426	000137	030064		JMP	RXAEND			
4258									
4259									
4260									
4261	027432	004737	014702		BGNTXA: JSR	PC,MAINM1			;SET MAINT MODE
4262	027436	005037	002250		CLR	FLAG			
4263									
4264	027442	012703	000004		MOV	@4,R3			;SELECT RANDOM PATTERN
4265	027446	012737	000174	012414	MOV	@KB56,TSPEED			;SELECT SPEED
4266									
4267	027454	012737	000001	012416	TXATAR: MOV	@1,LENGTH			;1ST TABLE LENGTH(200 WORDS)
4268									
4269	027462	013704	012416		TXABGN: MOV	LENGTH,R4			
4270	027466	012702	002370		MOV	@TABLE,R2			
4271	027472				BREAK				
4272	027474	004737	013160		10\$: JSR	PC,GENER			;WRITE TABLE
4273	027500	013722	012400		MOV	DATA,(R2)+			
4274	027504	005304			DEC	R4			
4275	027506	001372			BNE	10\$			
4276									
4277									
4278									
4279	027510	013704	012416		MOV	LENGTH,R4			;CLEAR RX TABLE
4280	027514	012702	006370		MOV	@TABLE,R2			
4281	027520	005022			20\$: CLR	(R2)+			
4282	027522	005304			DEC	R4			
4283	027524	001375			BNE	20\$			
4284									
4285									
4286									
4287									
4288									
4289									
4290									
4291	027526	013777	012414	162734	MOV	TSPEED,@KMVP14			;SEND TX SPEED
4292	027534	012777	002370	162714	MOV	@TABLE,@KMVP02			; " TX TABLE ADDRESS
4293	027542	013777	012416	162710	MOV	LENGTH,@KMVP04			; " " " LENGTH
4294	027550	012777	006370	162710	MOV	@TABLE,@KMVP12			;SEND RX TABLE ADDRESS
4295	027556	005077	162700		CLR	@KMVP06			;CLR EXTENDED ADDRESS
4296									
4297									
4298									
4299									
4300									
4301	027562	004537	014552		1\$: JSR	R5,TSTNUB			;DO TEST 42= CHB TEST
4302	027566	000042			.WORD	42			
4303									
4304									
4305									
4306	027570				2\$: WAITB	0,3			;WAIT FOR TEST EXECUTION

HARDWARE TESTS

```

4307
4308
4309 027610 004737 013102          JSR    PC,TSTERR          ;CHECK BSELO
4310
4311 027614 000427                BR     6$                ;TEST OK CHECK RX TABLE
4312 027616 000402                BR     3$                ;TIMEOUT ERROR
4313 027620 000401                BR     3$                ;NO KMV11 ANSWER
4314 027622 000410                BR     4$                ;CHECK SEL16 TO SEE WHICH ONE
4315
4316
4317 027624                3$:  ERRHRD  32,EM0004          ;NO KMV11 ANSWER
4318 027634 004737 012740          JSR    PC,CHKMAX          ;TOO MANY ERROR?
4319 027640          ESCAPE  TST
4320
4321
4322 027644                4$:
4323
4324
4325 027644 017737 162622 012424      MOV    @KMVP16,STAERR      ;READ ERROR STATUS
4326
4327 027652 017737 162606 012426      MOV    @KMVP10,WRDCNT      ;READ WORD COUNT DISCREPANCY
4328
4329 027660          ERRHRD  33,EM0017,PRSTER      ;ERROR WHILE TX,RX FRAMES,GIVE ERROR
4330          ESCAPE  TST          ;GIVE ERROR STATUS,WORD CNT DISCREPANCY
4331 027670
4332
4333
4334
4335
4336
4337 027674 012702 002370          6$:  MOV    @TTABLE,R2          ;LOAD TABLE PARAMETERS
4338 027700 012705 006370          MOV    @RTABLE,R5
4339 027704 013704 012416          MOV    LENGTH,R4
4340
4341 027710 022225          RXACK:  CMP    (R2), (R5)      ;CHECK TX AND RX TABLE
4342 027712 001015          BNE   RXAERR
4343 027714 005304          DEC   R4
4344 027716 001374          BNE   RXACK
4345
4346 027720 062737 000400 012416      ADD    @400,LENGTH          ;CHANGE LENGTH
4347 027726 022737 002000 012416      CMP    @2000,LENGTH
4348 027734 100252          BPL   TXABGN
4349 027736 005303          DEC   R3                    ;SELECT NEW PATERN
4350 027740 001245          BNE   TXATAR                ;ALL DONE
4351 027742 000137 030064          JMP    RXAEND
4352
4353
4354
4355 027746 162705 000002          RXAERR: SUB   @2,R5
4356 027752 162702 000002          SUB   @2,R2
4357
4358 027756 011237 012410          MOV    (R2),TXDATA
4359 027762 011537 012412          MOV    (R5),RXDATA
4360
4361 027766 005737 002250          TST   FLAG                  ;LOOK IF 1ST ERROR
4362 027772 001014          BNE   30$
4363

```

HARDWARE TESTS

4364	027774			ERRHRD	34,EM0017,PFRAME		;DATA CMP ERROR
4365	030004	005237	002250	INC	FLAG		
4366	030010	062702	000002	ADD	#2,R2		;POINT NEXT ADDRESS
4367	030014	062705	000002	ADD	#2,R5		
4368	030020	000137	027710	JMP	RXACK		
4369							
4370	030024			30\$: ERRHRD	34,0,PRAMEF		;SHORT REPORT
4371	030034	005237	002250	INC	FLAG		
4372	030040	062702	000002	ADD	#2,R2		
4373	030044	062705	000002	ADD	#2,R5		;POINT NEXT ADDRESS
4374	030050	022737	000010	002250	CMP	#10,FLAG	;LOOK IF 10 REPORT
4375	030056	001314		BNE	RXACK		
4376							
4377	030060			ESCAPE	TST		
4378							
4379							
4380							
4381							
4382							
4383	030064			RXAEND:			
4384	030064			ENDTST			

## HARDWARE TESTS

4386 030066

## BADHEAD

```

;***** TEST10 *****
;TRANSMIT DIFFERENT FRAMES OF VARIOUS LENGTH IN EXTERNAL LOOP BACK
;MODE ON CHANNEL B

```

4387

4388

4389 030066

## BADHEAD

```

;***** TEST10 *****

```

4390

4391

4392

4393

4394

4395

4396

4397 030066

## STARS 1

```

;
;AT BEGINNING OF TEST ,CHECK IF LOOP BACK CONNECTORS ARE INSTALLED
;OR NOT:IF NOT INSTALLED = EXIT TEST AND GIVE ERROR MESSAGE
;*****

```

4401

4402

4403

4404

4405

4406

4407

4408

4409

4410

4411

4412

4413

4414

4415

4416

4417

4418

4419

4420

4421

4422

4423

4424

4425

4426

4427

4428

4429

4430

4431

4432

4433

4434

4435

4436

4437

4438

4439

4440

```

;*****

```

```

;QBUS WRITE DIFFERENT TX TABLE OF VARIOUS LENGTH, LOAD IN KMV11 CSR'S
;THE TX AND RX TABLE ADDRESS ,THE TABLE LENGTH AND TRANSFER SPEED (56KB)

```

```

;DCT11 EXECUTE THE TRANSFER IN EXTERNAL MODE ON CHA AND WRITE BACK
;IN RX TABLE

```

```

;QBUS CHECK BSELO TO SEE THE STATUS OF THE TEST AND IF TEST DONE CHECK IF
;RX TABLE =TX TABLE

```

## ;PARAMETERS SELECTION:

```

;   SEL2= TX TABLE ADDRESS
;   SEL4= TX TABLE LENGTH
;   BSEL6= EXTENDED ADDRESS OF TX TABLE
;   BSEL7= " " " RX "
;   SEL12= RX TABLE ADDRESS
;   SEL14= SPEED SELECTION
;   SEL16= ERROR STATUS
;   BSELO= TEST STATUS
;   SEL10= RECEIVED BYTE COUNT      DIFFERENCE BETWEEN RX AND TX TABLE
;                                       >0 IF TX>RX,<0 IF TX<RX

```

## ;TEST STATUS DESCRIPTION:

```

;   BSELO= 0      =TEST DONE CHECK RX TABLE
;   BSELO= 200   =TIMEOUT ERROR
;   BSELO= TSTNB =NO KMV11 ANSWER
;   BSELO= 100   =ERROR DURING TEST ,LOOK WHICH ONE BY TESTING BSEL16

```

## HARDWARE TESTS

```

4441 ;ERROR STATUS DESCRIPTION:
4442 ;
4443 ;   WHEN BSELO=100,GIVE CONTAINIT OF ERROR STATUS AND WORD COUNT DISCREPANCY
4444 ;
4445 ;
4446 ;   SEL16= BIT14=1 =FCS ERROR
4447 ;   SEL16= BIT13=1 =OVERRUN ERROR
4448 ;   SEL16= BIT8 =1 =ILLEGAL INTERRUPT ERROR
4449 ;   SEL16= BIT7 =1 =RX ABORT ERROR
4450 ;   SEL16= BIT6 =1 =UNDERRUN ERROR
4451 ;   SEL16= BIT5 =1 =WORD COUNT DISCREPANCY
4452 ;   SEL16= BIT4 =1 =DMA IN TIMEOUT ERROR
4453 ;   SEL16= BIT3 =1 =DMA OUT TIMEOUT ERROR
4454 ;   SEL16= BIT1 =1 =DATA COMPARE ERROR BETWEEN TX AND RX TABLE (USED
4455 ;                                     ONLY DURING SELF TEST)
4456 ;
4457 ;
4458 ;
4459 ;MICRO DIAG TEST DESCRIPTION:
4460 ;TEST 43   =TRANSMIT VARIOUS LENGTHFRAME AT 56 KBAUDS SPEED ON CHANNEL B
4461 ;                                     IN EXTERNAL LOOP BACK MODE
4462 ;
4463 ;
4464 ;
4465 ;
4466 ;CAUTION:
4467 ;-----
4468 ;RUN ONLY WITH EXTERNAL LOOP BACK CONNECTOR:
4469 ;
4470 ;
4471 ;NOTE:FOR KMV11-B BOTH CONNECTORS MUST BEINSTALLED
4472 ;
4473 ;TO BE FULLY TESTED ,KMV11 DIAGNOSTIC MUST BE RUN WITH RS422 AND RS423
4474 ;EXTERNAL LOOP BACK CONECTOR
4475 ;
4476 ;
4477 ;
4478 ;FOR RS422 PLUG LOOP BACK CONNECTOR 2P-E155A-00 AT THE END OF 2P-E14UA-00
4479 ;MODEM CABLE.
4480 ;
4481 ;FOR RS423 PLUG LOOP BACK CONNECTOR H325 AT THE END OF 2P-E14VA-00
4482 ;MODEM CABLE.
4483 ;CAUTION:
4484 ;-----
4485 ;RUN ONLY WITH EXTERNAL LOOP BACK CONNECTOR:
4486 ;
4487 ;
4488 ;NOTE:FOR KMV11-B BOTH CONNECTORS MUST BEINSTALLED
4489 ;
4490 ;TO BE FULLY TESTED ,KMV11 DIAGNOSTIC MUST BE RUN WITH RS422 AND RS423
4491 ;EXTERNAL LOOP BACK CONECTOR
4492 ;
4493 ;
4494 ;
4495 ;FOR RS422 PLUG LOOP BACK CONNECTOR 2P-E155A-00 AT THE END OF 2P-E14UA-00
4496 ;MODEM CABLE.
4497 ;

```

HARDWARE TESTS

4498	:	FOR RS423 PLUG LOOP BACK CONNECTOR H325 AT THE END OF 2P-E14VA-00
4499	:	MODEM CABLE.
4500	:	
4501	:	
4502	:	
4503	:	
4504 030066	:	STARS 1

## HARDWARE TESTS

```

4506 030066          BGNTST
4507 030066 004737 014400      JSR      PC,CLRKMV
4508 030072 004737 014600      JSR      PC,CKKMV          ;LOOK IF LOOP BACK CON INSTALLED?
4509
4510
4511 030076 005737 012474      TST      LOOP          ;IS LOOP BIT=1?
4512 030102 001412          BEQ      BGNTXD        ;YES GO ON TEST
4513 030104          PRINTF  #MLOOP      ;NO LOOP BACK PLUGGED IN.THE MODULE
4514
4515
4516 030124 000137 03055b      JMP      RXDEND        ;WILL NOT BE TESTED IS EXTERNAL LOOP
4517
4518
4519
4520 030130 004737 014502      BGNTXD: JSR      PC,MAINM1 ;SET MAINT MODE
4521
4522 030134 012703 000004          MOV      #4,R3        ;SELECT RANDOM PATTERN
4523 030140 012737 000174 012414      MOV      #KB56,TSPEED ;SELECT SPEED
4524
4525 030146 012737 000001 012416      TXDTAR: MOV      #1,LENGTH ;1ST TABLE LENGTH
4526
4527 030154 013704 012416      TXDBGN: MOV      LENGTH,R4
4528 030160 012702 002370          MOV      #RTABLE,R2
4529 030164          BREAK
4530 030166 004737 013160      10$:   JSR      PC,GENER    ;WRITE TABLE
4531 030172 013722 012400          MOV      DATA,(R2)+
4532 030176 005304          DEC      R4
4533 030200 001372          BNE      10$
4534
4535
4536 030202 013704 012416          MOV      LENGTH,R4    ;CLEAR RX TABLE
4537 030206 012702 006370          MOV      #RTABLE,R2
4538 030212 005022      20$:   CLR      (R2)+
4539 030214 005304          DEC      R4
4540 030216 001375          BNE      20$
4541
4542
4543
4544
4545
4546 030220 013777 012414 162242      MOV      TSPEED,@KMVP14 ;SEND TX SPEED
4547 030226 012777 002370 162222      MOV      #RTABLE,@KMVP02 ; " TX TABLE ADDRESS
4548 030234 013777 012416 162216      MOV      LENGTH,@KMVP04 ; " " " LENGTH
4549 030242 012777 006370 162216      MOV      #RTABLE,@KMVP12 ;SEND RX TABLE ADDRESS
4550 030250 005077 162206      CLR      @KMVP06      ;CLR EXTENDED ADDRESS
4551
4552
4553
4554
4555
4556 030254 004537 014552      1$:   JSR      R5,TSTNUB
4557 030260 000043          .WORD   43          ;DO TEST 43= CHB TEST
4558
4559
4560
4561 030262      2$:   WAITB   0,3      ;WAIT FOR TEST EXECUTION
4562

```



## HARDWARE TESTS

```

4563
4564 030302 004737 013102          JSR    PC,TSTERR          ;CHECK BSELO
4565
4566 030306 000427          BR     6$                ;TEST OK CHECK RX TABLE
4567 030310 000402          BR     3$                ;TIMEOUT ERROR
4568 030312 000401          BR     3$                ;NO KMV11 ANSWER
4569 030314 000410          BR     4$                ;CHECK SEL16 TO SEE WHICH ONE
4570
4571
4572 030316          3$:  ERRHRD  36,EM0004          ;NO KMV11 ANSWER
4573 030326 004737 012740          JSR    PC,CHKMAX          ;TOO MANY ERROR, DROP IF YES
4574 030332          ESCAPE  TST
4575
4576
4577 030336          4$:
4578
4579
4580 030336 017737 162130 012424          MOV    @KMVP16,STAERR          ;READ ERROR STATUS
4581
4582 030344 017737 162114 012426          MOV    @KMVP10,WRDCNT          ;READ WORD COUNT DISCREPANCY
4583
4584 030352          ERRHRD  37,EM0020,PRSTER          ;ERROR WHILE TX,RX FRAMES,GIVE ERROR
4585
4586 030362          ESCAPE  TST                ;GIVE ERROR STATUS,WORD CNT DISCREPANCY
4587
4588
4589
4590
4591
4592 030366 012702 002370          6$:  MOV    @TTABLE,R2
4593 030372 012705 006370          MOV    @RTABLE,R5
4594 030376 013704 012416          MOV    LENGTH,R4
4595 030402 022225          RXDCK:  CMP    (R2)+,(R5)+
4596 030404 001015          BNE    RXDERR
4597 030406 005304          DEC    R4
4598 030410 001374          BNE    RXDCK
4599
4600 030412 062737 000400 012416          ADD    #400,LENGTH
4601 030420 022737 002000 012416          CMP    #2000,LENGTH
4602 030426 100252          BPL    TXDBGN
4603
4604 030430 005303          DEC    R3
4605 030432 001245          BNE    TXDTAR
4606 030434 000137 030556          JMP    RXDEND
4607
4608
4609
4610 030440 162705 000002          RXDERR:  SUB    #2,R5
4611 030444 162702 000002          SUB    #2,R2
4612
4613 030450 011237 012410          MOV    (R2),TXDATA
4614 030454 011537 012412          MOV    (R5),RXDATA
4615
4616 030460 005737 002250          TST    FLAG                ;LOOK IF 1ST ERROR
4617 030464 001014          BNE    30$
4618
4619 030466          ERRHRD  38,EM0015,PFRAME          ;DATA CMP ERROR

```

HARDWARE TESTS

4620	030476	005237	002250		INC	FLAG	
4621	030502	062702	000002		ADD	#2,R2	;POINT NEXT ADDRESS
4622	030506	062705	000002		ADD	#2,R5	
4623	030512	000137	030402		JMP	RXDCK	
4624							
4625	030516			304:	ERRHRD	38,0,PRAMEF	;SHORT REPORT
4626	030526	005237	002250		INC	FLAG	
4627	030532	062702	000002		ADD	#2,R2	
4628	030536	062705	000002		ADD	#2,R5	;POINT NEXT ADDRESS
4629	030542	022737	000010	002250	CMP	#10,FLAG	;LOOK IF 10 REPORT
4630	030550	001314			BNE	RXDCK	
4631							
4632	030552				ESCAPE	TST	
4633							
4634							
4635							
4636							
4637							
4638	030556				RXDEND:		
4639	030556				ENDTST		

HARDWARE TESTS

4641  
 4642  
 4643 030560  
 4644  
 4645 030560  
 4646  
 4647  
 4648  
 4649  
 4650  
 4651  
 4652 030560  
 4653  
 4654  
 4655  
 4656  
 4657  
 4658  
 4659  
 4660  
 4661  
 4662  
 4663  
 4664  
 4665  
 4666  
 4667  
 4668  
 4669  
 4670  
 4671  
 4672  
 4673  
 4674  
 4675  
 4676  
 4677  
 4678  
 4679  
 4680  
 4681  
 4682  
 4683 030560  
 4684

BADHEAD  
 ;\*\*\*\*\* TEST11 \*\*\*\*\*  
 ;TEST MODEM SIGNALS CCITT 108 AND CCITT 107 IN EXTERNAL LOOP BACK MODE  
 BADHEAD  
 ;\*\*\*\*\* TEST11 \*\*\*\*\*

STARS 1  
 ;CCITT 108/2 A IS BIT 7 IN 8255 CHIP ,PORT B = ADDRESS 130012  
 ; " B " 6 " " B " 130012  
 ; " 107 A " 5 " " A " 130000  
 ; " 107 B " 3 " " A " 130000

;QBUS WRITE CCITT 108A AND B ,AND READ BACK CCITT 107A/B

;CAUTION:

;-----  
 ;RUN ONLY WITH EXTERNAL LOOP BACK CONNECTOR:

;NOTE:FOR KMV11-B BOTH CONNECTORS MUST BE INSTALLED

;TO BE FULLY TESTED ,KMV11 DIAGNOSTIC MUST BE RUN WITH RS422 AND RS423  
 ;EXTERNAL LOOP BACK CONECTOR

;FOR RS422 PLUG LOOP BACK CONNECTOR 2P-E155A-00 AT THE END OF 2P-E14UA-00  
 ;MODEM CABLE.

;FOR RS423 PLUG LOOP BACK CONNECTOR H325 AT THE END OF 2P-E14VA-00  
 ;MODEM CABLE.

STARS 1

## HARDWARE TESTS

```

4686 030560          BGNTST
4687 030560 004737 014400      JSR    PC,CLRKMV      ;CLEAR KMV11 REGISTERS
4688 030564 004737 014600      JSR    PC,CKKMV      ;LOOK IF KMV11A OR B AND IF LOOP BACK
4689
4690 030570 005737 012474      TST    LOOP          ;LOOK IF LOOP BACK?
4691 030574 001412              BEQ    MOD108        ;YES GO ON
4692 030576              PRINTF  #MLOOP        ;NO LOOP BACK PLUGGED .THE MODULE
4693
4694
4695 030616 000137 031016      JMP    MODEND
4696
4697
4698
4699 030622 004737 014502      MOD108: JSR    PC,MAINM1
4700
4701
4702 030626 012737 000100 030642      MOV    #100,MODWR1+6      ;WRITE TTL 108B
4703
4704
4705
4706 030634 004537 014702      MODWR1: JSR    R5,WRITE      ;WRITE KMV REG ADDRESS 130012
4707 030640 130012              .WORD  130012
4708 030642 000000              .WORD  0                ;DATA TO WRITE
4709
4710 030644              WAITA  0
4711
4712
4713 030656 004537 014730      JSR    R5,READ        ;READ KMV ADDRESS 130000
4714 030662 130000              .WORD  130000
4715
4716
4717 030664 042737 177767 012374      BIC    #177767,BAD      ;MASK UNUSED BITS
4718 030672 022737 000010 012374      CMP    #10,BAD         ;CMP 108B AND 107B
4719 030700 001036              BNE    MODERB         ;REPORT ERROR IF BAD
4720
4721
4722
4723 030702 012737 000200 030716      MOV    #200,MODWR2+6      ;WRITE TTL 108A
4724
4725
4726
4727 030710 004537 014702      MODWR2: JSR    R5,WRITE      ;WRITE KMV REG ADDRESS 130012
4728 030714 130012              .WORD  130012
4729 030716 000000              .WORD  0                ;DATA TO WRITE
4730
4731 030720              WAITA  0
4732
4733
4734 030732 004537 014730      JSR    R5,READ        ;READ KMV ADDRESS 130000
4735 030736 130000              .WORD  130000
4736
4737
4738 030740 042737 177737 012374      BIC    #177737,BAD      ;MASK BIT BUT CCITT 107A/B
4739 030746 022737 000040 012374      CMP    #40,BAD         ;CMP 108A AND 107A
4740 030754 001420              BEQ    MODEND         ;OK EXIT TEST
4741
4742

```

HARDWARE TESTS

```

4743
4744
4745
4746 030756          MODERA: ERRHRD  40,EM0030          ;DATA CMP ERROR BETWEEN 107 AND 108
4747                                     JSR      PC,CHKMAX          ; ON CHANNEL A
4748 030766 004737 012740          ESCAPE TST          ;DROP IF TOO MANY ERROR
4749 030772
4750
4751
4752
4753 030776          MODERB: ERRHRD  41,EM0130          ;DATA CMP ERROR BETWEEN 107 AND 108
4754                                     JSR      PC,CHKMAX          ; ON CHANNEL B
4755 031006 004737 012740          ESCAPE TST          ;DROP IF TOO MANY ERROR
4756 031012
4757
4758
4759
4760
4761 031016          MODEND:
4762 031016          ENDTST

```

HARDWARE TESTS

4764  
4765 031020

BADHEAD

\*\*\*\*\* TEST12 \*\*\*\*\*  
;TEST MODEM SIGNALS ON KV11 B MODULE IN EXTERNAL LOOP BACK ON CHANEL A AND B

4766  
4767 031020

BADHEAD

\*\*\*\*\* TEST12 \*\*\*\*\*

4768  
4769  
4770  
4771  
4772  
4773  
4774 031020

STARS 1

;HOST SET TEST NUMBER 34 OR 35 (CHA OR CHB TEST)  
;DCT11 TEST MODEM SIGNAL 105,106,109 ON CHANEL A(TEST NB34) FIRST AND THEN  
;ON CHANEL B(TEST NB 35) BY SETTING AND CLEARING BIT 105 AND TESTING  
;BIT 106,AND 109

4775  
4776  
4777  
4778  
4779  
4780  
4781

;IF TEST =OK,DCT11 CLEAR BSELO  
;IF ERROR SET 100 IN BSELO AND REPORT ERROR

4782  
4783  
4784  
4785  
4786  
4787  
4788  
4789  
4790  
4791  
4792  
4793

;ERROR REPORT DESCRIPTION:  
;SEL2 INDICATE WHICH MODEM SIGNAL IS TESTED  
;SEL4 INDICATE THE RESULT OF THE TEST  
;SEL10 INDICATE IF IT WAS DURING A CLEAR OR A SET OPERATION  
;SEL 10 BIT 1=0 INDICATE A CLEAR OPERATION ON TESTED MODEM SIGNAL  
;                    =1       "       SET       "       "       "       "       "

4794  
4795  
4796  
4797  
4798  
4799

;SEL2 AND SEL4 FORMAT:  
;                    -----  
;                    /       /       /       /       / 109 / 106 /       / 105 /  
;                    -----  
;                    BIT 7   BIT 6   BIT5   BIT4   BIT3   BIT2   BIT1   BIT0

4800  
4801  
4802  
4803  
4804

;MODEM SIGNAL LINK:

;                    CCITT 105 (RTS)                    CCITT 106 (CTS)  
;                    -----  
;                    /                    /  
;                    /                    /  
;                    /                    /                    CCITT 109 (CD)  
;                    -----

4805  
4806  
4807  
4808  
4809  
4810  
4811  
4812  
4813  
4814  
4815  
4816  
4817  
4818

;MICRO TEST DESCRIPTION:  
;TEST 34:MODEM SIGNAL ON CHANEL A  
;TEST 35:MODEM SIGNAL ON CHANEL B

## HARDWARE TESTS

```
4819 ;
4820 ;CAUTION:
4821 ;-----
4822 ;RUN ONLY WITH EXTERNAL LOOP BACK CONNECTOR:
4823 ;
4824 ;
4825 ;NOTE:FOR KMV11-B BOTH CONNECTORS MUST BEINSTALLED
4826 ;
4827 ;TO BE FULLY TESTED ,KMV11 DIAGNOSTIC MUST BE RUN WITH RS422 AND RS423
4828 ;EXTERNAL LOOP BACK CONNECTOR
4829 ;
4830 ;
4831 ;
4832 ;FOR RS422 PLUG LOOP BACK CONNECTOR 2P-E155A-00 AT THE END OF 2P-E14UA-00
4833 ;MODEM CABLE.
4834 ;
4835 ;FOR RS423 PLUG LOOP BACK CONNECTOR H325 AT THE END OF 2P-E14VA-00
4836 ;MODEM CABLE.
4837 ;
4838 031020 STARS 1
4839
4840
```

## HARDWARE TESTS

```

4842 031020          BGNTST
4843 031020 004737 014400      JSR   PC,CLRKMV      ;CLEAR ALL REGISTERS
4844 031024 004737 014600      JSR   PC,CKKMV      ;TEST IF LOOP BACK CONNECTOR
4845
4846 031030 005737 012474      TST   LOOP
4847 031034 001412              BEQ   1$            ;LOOP BACK PRESENT GO ON
4848
4849 031036              PRINTF @MLOOP      ;NO LOOP BACK PLUGGED IN ,THE MODULE
4850                          ;WILL NOT BE TESTED IS EXTERNAL LOOP
4851
4852 031056 000137 031016      JMP   MODEND        ;GO TO FOLLOWING TEST
4853
4854
4855 031062          1$:
4856 031062          BGNSUB
4857
4858 031064 004737 014502      JSR   PC,MAINM1     ;SET MAINTENANCE MODE
4859 031070 004537 014552      JSR   R5,TSTNUB
4860 031074 000034              .WORD  34           ;SEND TEST 34(MODEM SIGNAL ON CHA)
4861
4862 031076              WAITB  0.2
4863
4864 031116 004737 013102      JSR   PC,TSTERR     ;CHECK TEST RESULT
4865 031122 000432              BR    3$            ;TEST OK GO ON
4866 031124 000402              BR    4$            ;TIMEOUT
4867 031126 000401              BR    4$            ;NO TEST ANSWER
4868 031130 000410              BR    5$            ;ERROR DURING TEST ,LOOK WHICH ONE
4869
4870
4871
4872 031132          4$:
4873 031142 004737 012740      ERRHRD 42,EM0004    ;NO ANSWER
4874 031146              JSR   PC,CHKMAX     ;DROP IF TOO MANY ERROR
4875                          ESCAPE SUB
4876 031152 017737 161300 002272 5$:
4877 031160 017737 161274 012374      MOV   @KMVP02,GOOD  ;READ WHICH SIGNAL WAS TESTED
4878 031166 017737 161272 012400      MOV   @KMVP04,BAD   ; " " IS THE RESULT OF TEST
4879                          MOV   @KMVP10,DATA   ;READ SIGAL VALUE
4880 031174              ERRHRD 43,EM0032,PMODEM
4881 031204              ESCAPE SUB      ;REPORT ERROR
4882
4883 031210          3$:
4884 031210          ENDSUB
4885
4886
4887 031212          BGNSUB
4888
4889 031214 004737 014502      JSR   PC,MAINM1     ;SET MAINTENANCE MODE
4890 031220 004537 014552      JSR   R5,TSTNUB
4891 031224 000035              .WORD  35           ;SEND TEST 35(MODEM SIGNAL ON CHB)
4892
4893 031226              WAITB  0.2
4894
4895 031246 004737 013102      JSR   PC,TSTERR     ;CHECK TEST RESULT
4896 031252 000432              BR    3$            ;TEST OK GO ON
4897 031254 000402              BR    4$            ;TIMEOUT
4898 031256 000401              BR    4$            ;NO TEST ANSWER

```



## HARDWARE TESTS

```

4899 031260 000410          BR      5:          ;ERROR DURING TEST ,LOOK WHICH ONE
4900
4901
4902
4903 031262          4:      ERRHRD  44,EM0004          ;NO ANSWER
4904 031272 004737 012740    JSR      PC,CHKMAX          ;DROP IF TOO MANY ERROR
4905 031276          ESCAPE SUB
4906
4907 031302 017737 161150 002272 5:      MOV      @KMVP02,GOOD          ;READ WHICH SIGNAL WAS TESTED
4908 031310 017737 161144 012374    MOV      @KMVP04,BAD          ; " " IS THE RESULT OF TEST
4909 031316 017737 161142 012400    MOV      @KMVP10,DATA        ;READ SIGAL VALUE
4910
4911 031324          ERRHRD  45,EM0034,PMODEM          ;REPORT ERROR
4912 031334          ESCAPE SUB
4913
4914 031340          3:
4915 031340          ENDSUB
4916
4917
4918 031342          ENDTST

```

HARDWARE TESTS

4920  
 4921  
 4922  
 4923  
 4924  
 4925  
 4926  
 4927  
 4928  
 4929  
 4930  
 4931  
 4932  
 4933  
 4934  
 4935  
 4936  
 4937  
 4938  
 4939 031344  
 4940  
 4941 031346  
 4942 031356  
 4943 031366  
 4944 031400  
 4945  
 4952  
 4953  
 4954 031400  
 031403  
 031406  
 031411  
 031414  
 031417  
 031422  
 031425  
 031430  
 4955 031432  
 031435  
 031440  
 031443  
 031446  
 031451  
 031454  
 031457  
 031462  
 031465  
 4956 031466  
 031471  
 031474  
 031477  
 031502  
 031505  
 031510  
 031513  
 031516  
 031521

115  
 122  
 103  
 040  
 123  
 101  
 122  
 123  
 040  
 040  
 115  
 122  
 103  
 040  
 103  
 122  
 104  
 105  
 040  
 000  
 115  
 122  
 103  
 040  
 103  
 122  
 104  
 105  
 040  
 000  
 115  
 122  
 103  
 040  
 111  
 117  
 120  
 120  
 117  
 124  
 114  
 126  
 040  
 000

.SBTTL HARDWARE PARAMETER CODING SECTION

```

:////////////////////
:/ THE HARDWARE PARAMETER CODING SECTION CONTAINS MACROS
:/ THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES. THE
:/ MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
:/ INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES. THE
:/ MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
:/ WITH THE OPERATOR.
:////////////////////

```

BGNHRD

GPRMA ADDRES,0,0,60000,177776,YES  
 GPRMA VECTOR,2,0,0,674,YES  
 GPRMD PRIRTY,4,0,7000,4,7,YES  
 ENDHRD

ADDRES: .ASCIZ /MICRO-CPU CSR ADDRESS : /

VECTOR: .ASCIZ /MICRO-CPU VECTOR ADDRESS : /

PRIRTY: .ASCIZ /MICRO-CPU PRIORITY LEVEL : /

HARDWARE PARAMETER CODING SECTION

4957  
4958  
4959  
4960  
4961  
4962  
4963  
4964

.EVEN

,'  
,'  
,'  
,'

SOFTWARE PARAMETER CODING SECTION

.SBTTL SOFTWARE PARAMETER CODING SECTION

4966  
4967  
4968  
4969  
4970  
4971  
4972  
4973  
4974  
4975  
4976  
4977  
4978 031522  
4979  
4988  
4989  
4990 031524  
4991  
4992  
4999  
5000

://  
:/ THE SOFTWARE PARAMETER CODING SECTION CONTAINS MACROS  
:/ THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES. THE  
:/ MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE  
:/ INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES. THE  
:/ MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS  
:/ WITH THE OPERATOR.  
://

BGNSFT

ENDSFT

SOFTWARE PARAMETER CODING SECTION

```
5002          032000          .=<.!376>*2          ; END OF PAGE
5003
5004
5005 032000          $PATCH::
5006 032000          .BLKW 60
5007
5014
5015 032140          LASTAD
      032144          L$LAST::
5016 032144          ENDMOD
5017
5018
```

SOFTWARE PARAMETER CODING SECTION

5020  
5021  
5034  
5035 032144  
5036 032144  
5037 032150 177000  
5038 032152 000300  
5039 032154 004000  
5040 032156 000001  
5041 032160  
5042 032160  
5043  
5044  
5045  
5046  
5047  
504b 000001

BGNSETUP 1  
BGNPTAB  
.WORD 177000  
.WORD 300  
.WORD 4000  
.WORD 1  
ENDPTAB  
ENDSETUP

.END

SYMBOL TABLE

ABORT 023552	CKSELO 013620	DATA1 = 052525 G	F\$END = 000041	G\$RADA= 000140
ADDR 002362	CLRKMV 014400	DATA2 = 125252 G	F\$HARD= 000004	G\$RADB= 000000
ADDRES 031400	COUNT 002356	DELCT1 002266	F\$HW = 000013	G\$RADD= 000040
ADR = 000020 G	C\$AU = 000052	DELCT2 002270	F\$INIT= 000006	G\$RADL= 000120
ASSEMB= 000010	C\$AUTO= 000061	DFPTBL 002164 G	F\$JMP = 000050	G\$RADO= 000020
BAD 012374	C\$BRK = 000022	DIAGMC= 000000	F\$MOD = 000000	G\$XFER= 000004
BDDAT 002366	C\$BSEG= 000004	DROPD 023744	F\$MSG = 000011	G\$YES = 000010
BDRGEN 024522	C\$BSUB= 000002	EF.CON= 000036 G	F\$PROT= 000021	HELP = 000000
BDROK0 024746	C\$CEFG= 000045	EF.NEW= 000035 G	F\$PWR = 000017	HOE = 100000 G
BDROK1 025214	C\$CLCK= 000062	EF.PWR= 000034 G	F\$RPT = 000012	IBE = 010000 G
BGNTXA 027432	C\$CLEA= 000012	EF.RES= 000037 G	F\$SEG = 000003	IDU = 000040 G
BGNTXD 030130	C\$CLOS= 000035	EF.STA= 000040 G	F\$SOFT= 000005	IER = 020000 G
BIT0 = 000001 G	C\$CLP1= 000006	EM0001 015120	F\$SRV = 000010	INIFLG 012432
BIT00 = 000001 G	C\$CVEC= 000036	EM0002 015215	F\$SUB = 000002	INTFLG 012372
BIT01 = 000002 G	C\$DCLN= 000044	EM0003 015261	F\$SW = 000014	INTTX 025250
BIT02 = 000004 G	C\$DODU= 000051	EM0004 015347	F\$TEST= 000001	ISR = 000100 G
BIT03 = 000010 G	C\$DRPT= 000024	EM0006 015376	GDDAT 002364	IXE = 004000 G
BIT04 = 000020 G	C\$DU = 000053	EM0007 015440	GDREV 012430	I\$AU = 000041
BIT05 = 000040 G	C\$EDIT= 000003	EM0010 015531	GENER 013160	I\$AUTO= 000041
BIT06 = 000100 G	C\$ERDF= 000055	EM0011 015604	GENER1 013302	I\$CLN = 000041
BIT07 = 000200 G	C\$ERHR= 000056	EM0012 015664	GENEX 013440	I\$DU = 000041
BIT08 = 000400 G	C\$ERRO= 000060	EM0013 015762	GENINC 013432	I\$HRD = 000041
BIT09 = 001000 G	C\$ERSF= 000054	EM0014 016262	GENISH 013310	I\$INIT= 000041
BIT1 = 000002 G	C\$ERSO= 000057	EM0015 016333	GENO 025174	I\$MOD = 000041
BIT10 = 002000 G	C\$ESCA= 000010	EM0016 016432	GENOUT 024726	I\$MSG = 000041
BIT11 = 004000 G	C\$ESEG= 000005	EM0017 016723	GENRAN 013312	I\$PROT= 000040
BIT12 = 010000 G	C\$ESUB= 000003	EM0020 017020	GENROT 013266	I\$PTAB= 000041
BIT13 = 020000 G	C\$ETST= 000001	EM0023 017115	GENRO 013254	I\$PWR = 000041
BIT14 = 040000 G	C\$EXIT= 000032	EM0024 017200	GENR1 013244	I\$RPT = 000041
BIT15 = 100000 G	C\$GETB= 000026	EM0027 017227	GENSEL 013176	I\$SEG = 000041
BIT2 = 000004 G	C\$GETW= 000027	EM0030 017301	GENO 013216	I\$SETU= 000041
BIT3 = 000010 G	C\$GMAN= 000043	EM0032 017473	GEN1 013222	I\$SFT = 000041
BIT4 = 000020 G	C\$GPHR= 000042	EM0033 016204	GEN25 013236	I\$SRV = 000041
BIT5 = 000040 G	C\$GPLO= 000030	EM0034 017564	GEN52 013230	I\$SUB = 000041
BIT6 = 000100 G	C\$GPRI= 000040	EM0035 017655	GETPRM 023350	I\$TST = 000041
BIT7 = 000200 G	C\$INIT= 000011	EM0112 016034	GOOD 002272	J\$JMP = 000167
BIT8 = 000400 G	C\$INLP= 000020	EM0113 016132	GOOD0 002274	KB1.2 = 013224 G
BIT9 = 001000 G	C\$MANI= 000050	EM0115 016527	GOOD1 002276	KB56 = 000174 G
BOE = 000400 G	C\$MEM = 000031	EM0116 016626	GOOD10 002306	KB64 = 000154 G
BRXCK 026126	C\$MSG = 000023	EM0130 017376	GOOD12 002310	KB68 = 000146 G
BRXEND 026266	C\$OPEN= 000034	END 023560	GOOD14 002312	KB70 = 000143 G
BRXERR 026150	C\$PNTB= 000014	ERRBLK 002230 G	GOOD16 002314	KB72 = 000141 G
BSELO 012376	C\$PNTF= 000017	ERRCNT 002236 G	GOOD2 002300	KIND 012404
BSEL1 002340	C\$PNTS= 000016	ERRMSG 002226 G	GOOD4 002302	KMTLVL 012452
BTXSTA 025700	C\$PNTX= 000015	ERRNBR 002224 G	GOOD6 002304	KMVCSR 012454
BXCK = ***** GX	C\$QIO = 000377	ERRTYP 002222 G	G\$CNT0= 000200	KMVLVL 012442
BXLBGN 026764	C\$RDBU= 000007	EVL = 000004 G	G\$DELM= 000372	KMVP02 012456
BXLCK 027212	C\$REFG= 000047	EXADDR 012370	G\$DISP= 000003	KMVP04 012460
BXLEND 027366	C\$RESE= 000033	E\$END = 002100	G\$EXCP= 000400	KMVP06 012462
BXLERR 027250	C\$REVI= 000003	E\$LOAD= 000035	G\$HILI= 000002	KMVP10 012464
BXL TAR 026756	C\$RFLA= 000021	FLAG 002250	G\$LOLI= 000001	KMVP12 012466
CBSELO 013652	C\$RPT = 000025	FTIME 002252	G\$NO = 000000	KMVP14 012470
CHANEL 012406	C\$SEFG= 000046	F\$AU = 000015	G\$OFFS= 000400	KMVP16 012472
CHKMAX 012740	C\$SPRI= 000041	F\$AUTO= 000020	G\$OFSI= 000376	KMVV00 012440
CKALL 013710	C\$SVEC= 000037	F\$BGN = 000040	G\$PRMA= 000001	KMVV02 012446
CKKMV 014600	C\$TPRI= 000013	F\$CLEA= 000007	G\$PRMD= 000002	KMVV04 012444
CKREG 014156	DATA 012400	F\$DU = 000016	G\$PRML= 000000	KMVV06 012450

SYMBOL TABLE

KMV11B	002000	G	L\$STA	002030	G	MLOOP	017736	PRSELO	021520	G	STAERR	012424
LENGTH	012416		L\$SW	002260		MODEM1	021301	PRSTER	023006	G	SVCGBL =	000000
LOCK	002232		L\$TEST	002114	G	MODEM2	021345	PRT11V	022526	G	SVCINS =	177777
LOE =	040000	G	L\$TIML	002014	G	MODEM3	021404	PSTACK	002242		SVCSUB =	177777
LOGDEV	002240		L\$UIT	002262		MODEND	031016	PVECT	022470	G	SVCTAG =	177777
LOKFLG	012434		L\$UNIT	002012	G	MODERA	030756	QV.FLG	012435		SVCTST =	177777
LOOP	012474		L10001	002174		MODERB	030776	RANCLC	013412		S\$LSYM =	010000
LOT =	000010	G	L10002	021554		MODWR1	030634	RANDN	002350		TFM36	015032
L\$ACP	002110	G	L10003	021612		MODWR2	030710	RANEX	013430		TIM	015014
L\$APT	002036	G	L10004	022120		MOD108	030622	RANGEN	013332		TSPEED	012414
L\$AU	023776	G	L10005	022376		MFRAMEF	021447	RANMTA	002346		TSTERR	013102
L\$AUT	002070	G	L10006	022434		MREG0	020062	RANSEC	013416		TSTNUB	014552
L\$AUTO	023620	G	L10007	022466		MREG10	020302	RANSEL	002344		TTABLE	002370
L\$CCP	002106	G	L10010	022524		MREG12	020346	RANST	002342		TXABGN	027462
L\$CLEA	023712	G	L10011	022562		MREG14	020412	RAN1	013344		TXATAR	027454
L\$CO	002032	G	L10012	022650		MREG16	020456	RAN2	013362		TXDATA	012410
L\$DEPO	002011	G	L10013	022752		MREG2	020126	RAN4	013420		TXDBGN	030154
L\$DESC	002174	G	L10014	023004		MREG4	020172	READ	014730		TXDTAR	030146
L\$DESP	002076	G	L10015	023062		MREG6	020236	REGADR	012476		TXLBGN	026324
L\$DEVP	002060	G	L10016	023120		MSELO	020014	REVPRO	024132		TXLTAR	026316
L\$DISP	002132	G	L10017	023126		MSTER1	021204	ROMMAP	024000		TXSTAR	025254
L\$DLY	002116	G	L10020	023560		MSTER2	021236	RSTREG	013540		T\$ARGC =	000001
L\$DTP	002040	G	L10021	023710		MT11V	020761	RTABLE	006370		T\$CODE =	002032
L\$DTYP	002034	G	L10022	023714		MVECT	020705	RTCLK	024202		T\$ERRN =	000055
L\$DU	023716	G	L10023	023774		NERRS	013032	RUNNIN	023562		T\$EXCP =	000000
L\$DUT	002072	G	L10024	023776		NEXT	023270	RXACK	027710		T\$FLAG =	000040
L\$DVTY	012676	G	L10025	024120		NUB	012420	RXAEND	030064		T\$FREE =	032160
L\$EF	002052	G	L10026	024170		NUMBER	002360	RXAERR	027746		T\$GMAN =	000000
L\$ENVI	002044	G	L10027	024500		O\$APTS =	000000	RXCCK	025502		T\$HILI =	000007
L\$ERRT	002222	G	L10030	025216		O\$AU =	000000	RXCNT	012422		T\$LAST =	000001
L\$ETP	002102	G	L10031	024746		O\$BGNR =	000000	RXDATA	012412		T\$LOLI =	000004
L\$EXP1	002046	G	L10032	025214		O\$BGNS =	000000	RXDCK	030402		T\$LSYM =	010000
L\$EXP4	002064	G	L10033	025642		O\$DU =	000001	RXDEND	030556		T\$LTNO =	000014
L\$EXP5	002066	G	L10034	026266		O\$ERRT =	000000	RXDERR	030440		T\$NEST =	177777
L\$HARD	031346	G	L10035	026726		O\$GNSW =	000001	RXEND	025642		T\$NS0 =	000000
L\$HIME	002120	G	L10036	027366		O\$POIN =	000001	RXERR	025524		T\$NS1 =	000005
L\$HPCP	002016	G	L10037	030064		O\$SETU =	000001	RXLCK	026552		T\$NS2 =	000002
L\$HPTP	002022	G	L10040	030556		PADFLT	023064	RXLEND	026726		T\$PCNT =	000000
L\$HW	002164	G	L10041	031016		PBSELO	022400	RXLERR	026610		T\$PTAB =	010050
L\$ICP	002104	G	L10042	031342		PFRAME	022564	SAVE4	002254		T\$PTHV =	000001
L\$INIT	023130	G	L10043	031210		PINTR	022436	SAVE6	002256		T\$PTNU =	000001
L\$LADP	002026	G	L10044	031340		PMODEM	022652	SAVPC	002246		T\$SAVL =	177777
L\$LAST	032144	G	L10045	031400		PNT =	001000	SAVPC1	002352		T\$SEGL =	177777
L\$LOAD	002100	G	L10046	031524		PRALL	021614	SAVREG	013460		T\$SIZE =	000006
L\$LUN	002074	G	L10047	032150		PRAMEF	022754	SAVSP	002244		T\$SUBN =	000002
L\$MREV	002050	G	L10051	032160		PRI =	002000	SAVSTA	002354		T\$TAGL =	177777
L\$NAME	002000	G	MAINM1	014502		PRINT	021556	SELO	002316		T\$TAGN =	010052
L\$PRIO	002042	G	MAINT0 =	054000	G	PRIPTY	031466	SEL1	002320		T\$TEMP =	000000
L\$PROT	002122	G	MAINT1 =	044000	G	PRI00 =	000000	SEL10	002330		T\$TEST =	000014
L\$PRT	002112	G	MAXERR	002234		PRI01 =	000040	SEL12	002332		T\$TSTM =	177777
L\$REPP	002062	G	MAXPRI =	000300	G	PRI02 =	000100	SEL14	002334		T\$TSTS =	000001
L\$REV	002010	G	MSELO	020556		PRI03 =	000140	SEL16	002336		T\$\$AU =	010024
L\$RPT	023122	G	MCLR =	040000	G	PRI04 =	000200	SEL2	002322		T\$\$AUT =	010021
L\$SOFT	031524	G	MFRAM1	021043		PRI05 =	000240	SEL4	002324		T\$\$CLE =	010022
L\$SPC	002056	G	MFRAM2	021121		PRI06 =	000300	SEL6	002326		T\$\$DAT =	010051
L\$SPCP	002020	G	MINT	020522		PRI07 =	000340	SETUP	023262		T\$\$DU =	010023
L\$SPTP	002024	G	MINTR	020620		PRREG	022122	SSTACK	012676		T\$\$HAR =	010045



## SYMBOL TABLE

T\$\$HW = 010001	T\$\$TES= 010042	T4	024502 G	UAM = 000200 G	WRITE 014702
T\$\$INI= 010020	T1 024000 G	T4.1	024502	UNIT 002264	X\$ALWA= 000000
T\$\$MSG= 010016	T10 030066 G	T4.2	024750	UUT 012436	X\$FALS= 000040
T\$\$PC = 000001	T11 030560 G	T5	025220 G	VECT 012402	X\$OFFS= 000400
T\$\$PRO= 010000	T12 031020 G	T6	025644 G	VECTOR 031432	X\$TRUE= 000020
T\$\$PTA= 010050	T12.1 031062	T7	026270 G	WAIT1 012726	\$LSTIN= 000000
T\$\$RPT= 010017	T12.2 031212	T8	026730 G	WAIT2 012706	\$LSTTA= 000000
T\$\$SOF= 010046	T2 024122 G	T9	027370 G	WRDCNT 012426	\$PATCH 032000 G
T\$\$SUB= 010044	T3 024172 G				

. ABS. 032160 000  
000000 001

ERRORS DETECTED: 0

VIRTUAL MEMORY USED: 29248 WORDS ( 115 PAGES)

DYNAMIC MEMORY: 19748 WORDS ( 75 PAGES)

ELAPSED TIME: 00:09:16

CNKMEA.BIC,CNKMEA.SEQ/CR/-SP=SVC34.MLB/ML,CNKMEA.MAC

## SYMBOL CROSS REFERENCE

CREF V02

SYMBOL	VALUE	REFERENCES
ABORT	023552	51-2654 #51-2710
ADDR	002362	#26-1310 49-2472 49-2539 *57-2966
ADDRES	031400	80-4941 #80-4954
ADR	= 000020 G	#24-1191
ASSEMB	= 000010	19-1004 19-1004
BAD	012374	#26-1319 *45-2258 49-2420 49-2508 58-3007 *77-4717 77-4718 *77-4738 77-4739 *79-4877 *79-4908
BDDAT	002366	#26-1312
BDRGEN	024522	#61-3237
BDROKO	024746	61-3240 #61-3294
BDROK1	025214	62-3308 #62-3362
BGNTXA	027432	73-4254 #73-4261
BGNTXD	030130	75-4512 #75-4520
BIT0	= 000001 G	#24-1191
BIT00	= 000001 G	#24-1191 24-1191
BIT01	= 000002 G	#24-1191 24-1191
BIT02	= 000004 G	#24-1191 24-1191
BIT03	= 000010 G	#24-1191 24-1191
BIT04	= 000020 G	#24-1191 24-1191
BIT05	= 000040 G	#24-1191 24-1191
BIT06	= 000100 G	#24-1191 24-1191
BIT07	= 000200 G	#24-1191 24-1191
BIT08	= 000400 G	#24-1191 24-1191
BIT09	= 001000 G	#24-1191 24-1191
BIT1	= 000002 G	#24-1191
BIT10	= 002000 G	#24-1191
BIT11	= 004000 G	#24-1191
BIT12	= 010000 G	#24-1191
BIT13	= 020000 G	#24-1191
BIT14	= 040000 G	#24-1191
BIT15	= 100000 G	#24-1191
BIT2	= 000004 G	#24-1191
BIT3	= 000010 G	#24-1191
BIT4	= 000020 G	#24-1191
BIT5	= 000040 G	#24-1191
BIT6	= 000100 G	#24-1191
BIT7	= 000200 G	#24-1191
BIT8	= 000400 G	#24-1191
BIT9	= 001000 G	#24-1191
BOE	= 000400 G	#24-1191
BRXCK	026126	#66-3713 66-3716 66-3747
BRXEND	026266	66-3725 #66-3752
BRXERR	026150	66-3714 #66-3727
BSELO	012376	#26-1320 *38-1919 38-1920 49-2460
BSEL1	002340	#26-1301
BTXSTA	025700	#66-3643 66-3721
BXCK	= ***** GX	71-4134
BXLBGN	026764	#71-4038 71-4111
BXLCK	027212	#71-4104 71-4107 71-4141
BXLEND	027366	71-4117 #71-4148
BXLERR	027250	71-4105 #71-4121
BXLTAR	026756	#71-4036 71-4115

SYMBOL CROSS REFERENCE

CREF V02

SYMBOL	VALUE	REFERENCES
CBSELO	013652	34-1591 34-1596 34-1601 #38-1917
CHANEL	012406	#26-1326
CHKMAX	012740	#33-1536 44-2184 45-2255 49-2414 49-2421 49-2434 49-2450 49-2461 49-2473
		49-2482 49-2490 49-2499 49-2510 49-2533 49-2540 58-3011 59-3105 59-3111
		59-3116 59-3128 59-3135 59-3144 61-3248 61-3259 61-3269 61-3280 61-3289
		62-3316 62-3327 62-3337 62-3348 62-3357 64-3492 66-3689 68-3886 71-4082
		73-4318 75-4573 77-4748 77-4755 79-4873 79-4904
CKALL	013710	#39-1947 41-2066
CKKMV	014600	#44-2170 73-4252 75-4508 77-4688 79-4844
CKREG	014156	#40-1999
CKSELO	013620	#38-1903 42-2103
CLRKMV	014400	#41-2054 44-2170 58-2999 59-3071 61-3231 62-3299 64-3435 66-3633 68-3830
		71-4028 73-4251 75-4507 77-4687 79-4843
COUNT	002356	#26-1308
C\$AU	= 000052	#19-1004 55-2883
C\$AUTO	= 000061	#19-1004 52-2762
C\$BRK	= 000022	#19-1004 31-1478 31-1492 68-3842 71-4040 73-4271 75-4529
C\$BSEG	= 000004	#19-1004
C\$BSUB	= 000002	#19-1004 61-3230 62-3298 79-4856 79-4887
C\$CEFG	= 000045	#19-1004
C\$CLCK	= 000062	#19-1004
C\$CLEA	= 000012	#19-1004 53-2802
C\$CLOS	= 000035	#19-1004
C\$CLP1	= 000006	#19-1004
C\$CVEC	= 000036	#19-1004
C\$DCLN	= 000044	#19-1004 33-1553 51-2710
C\$DODU	= 000051	#19-1004 33-1551 52-2758
C\$DRPT	= 000024	#19-1004
C\$DU	= 000053	#19-1004 54-2856
C\$EDIT	= 000003	#19-1004 20-1056
C\$ERDF	= 000055	#19-1004
C\$ERHR	= 000056	#19-1004 41-2076 42-2106 44-2183 45-2254 57-2968 58-3010 59-3104 59-3110
		59-3115 59-3123 59-3127 59-3134 59-3143 61-3247 61-3258 61-3268 61-3279
		61-3288 62-3315 62-3326 62-3336 62-3347 62-3356 64-3491 64-3504 64-3542
		64-3548 66-3688 66-3701 66-3736 66-3742 68-3885 68-3896 68-3934 68-3940
		71-4081 71-4092 71-4130 71-4136 73-4317 73-4329 73-4364 73-4370 75-4572
		75-4584 75-4619 75-4625 77-4746 77-4753 79-4872 79-4880 79-4903 79-4911
C\$ERRO	= 000060	#19-1004
C\$ERSF	= 000054	#19-1004
C\$ERSO	= 000057	#19-1004
C\$ESCA	= 000010	#19-1004 57-2959 57-2969 57-2974 58-3012 59-3106 59-3112 59-3117 59-3124
		59-3129 59-3136 59-3145 61-3249 61-3260 61-3270 61-3281 61-3290 62-3317
		62-3328 62-3338 62-3349 62-3358 64-3493 64-3506 64-3555 66-3690 66-3703
		66-3749 68-3887 68-3898 68-3947 71-4083 71-4094 71-4143 73-4319 73-4331
		73-4377 75-4574 75-4586 75-4632 77-4749 77-4756 79-4874 79-4881 79-4905
		79-4912
C\$ESEG	= 000005	#19-1004
C\$ESUB	= 000003	#19-1004 61-3295 62-3363 79-4884 79-4915
C\$ETST	= 000001	#19-1004 57-2976 58-3014 59-3151 62-3364 64-3562 66-3756 68-3953 71-4149
		73-4384 75-4639 77-4762 79-4918
C\$EXIT	= 000032	#19-1004 51-2706 51-2711
C\$GETB	= 000026	#19-1004

SYMBOL CROSS REFERENCE

CREF V02

SYMBOL	VALUE	REFERENCES
C\$GETW	= 000027	@19-1004
C\$GMAN	= 000043	@19-1004
C\$GPHR	= 000042	@19-1004 51-2660
C\$GPLO	= 000030	@19-1004
C\$GPRI	= 000040	@19-1004 36-1805 37-1874
C\$INIT	= 000011	@19-1004 51-2714
C\$INLP	= 000020	@19-1004 33-1536
C\$MANI	= 000050	@19-1004
C\$MEM	= 000031	@19-1004
C\$MESSG	= 000023	@19-1004 49-2415 49-2422 49-2435 49-2451 49-2462 49-2474 49-2483 49-2491 49-2500 49-2511 49-2521 49-2534 49-2541
C\$OPEN	= 000034	@19-1004
C\$PNTB	= 000014	@19-1004 49-2413 49-2420 49-2426 49-2427 49-2428 49-2429 49-2430 49-2431 49-2432 49-2433 49-2443 49-2444 49-2445 49-2446 49-2447 49-2448 49-2449 49-2460 49-2472 49-2481 49-2489 49-2497 49-2498 49-2507 49-2508 49-2509 49-2520 49-2531 49-2532 49-2539
C\$PNTF	= 000017	@19-1004 33-1550 51-2657 54-2844 73-4255 75-4513 77-4692 79-4849
C\$PNTS	= 000016	@19-1004
C\$PNTX	= 000015	@19-1004
C\$QIO	= 000377	@19-1004
C\$RDBU	= 000007	@19-1004
C\$REFG	= 000047	@19-1004 51-2641 51-2644 51-2647
C\$RESE	= 000033	@19-1004 @19-1004 53-2800
C\$REVI	= 000003	@19-1004 20-1056
C\$RFLA	= 000021	@19-1004 33-1540
C\$RPT	= 000025	@19-1004 50-2572
C\$SEFG	= 000046	@19-1004
C\$SPRI	= 000041	@19-1004 36-1806 36-1817 37-1875 37-1886
C\$SVEC	= 000037	@19-1004 51-2625
C\$TPRI	= 000013	@19-1004
DATA	012400	@26-1321 *35-1747 49-2509 64-3449 66-3647 68-3844 71-4042 73-4273 75-4531 *79-4878 *79-4909
DATA1	= 052525	G @24-1199
DATA2	= 125252	G @24-1200
DELCT1	002266	@26-1280 *31-1475 *31-1490 *41-2057 *42-2100 *43-2130 *59-3076 *61-3237 *62-3305 *64-3480 *66-3677 *68-3874 *71-4070 *73-4306 *75-4561 *77-4710 *77-4731 *79-4862 *79-4893
DELCT2	002270	@26-1281 *31-1480 *42-2101 *59-3076 *61-3237 *62-3305 *64-3480 *66-3677 *68-3874 *71-4070 *73-4306 *75-4561 *79-4862 *79-4893
DFPTBL	002164	G @23-1133
DIAGMC	= 000000	19-1004 19-1004
DROPD	023744	54-2844 @54-2852
EF.CON	= 000036	G @24-1191 51-2644
EF.NEW	= 000035	G @24-1191 51-2647
EF.PWR	= 000034	G @24-1191
EF.RES	= 000037	G @24-1191
EF.STA	= 000040	G @24-1191 51-2641
EM0001	015120	42-2106 @47-2303
EM0002	015215	41-2076 @47-2305
EM0003	015261	@47-2307
EM0004	015347	44-2183 45-2254 @47-2309 59-3110 61-3247 62-3315 64-3491 66-3688 68-3885 71-4081 73-4317 75-4572 79-4872 79-4903

SYMBOL CROSS REFERENCE

CREF V02

SYMBOL	VALUE	REFERENCES
EM0006	015376	#47-2311 59-3104
EM0007	015440	#47-2313 59-3123
EM0010	015531	#47-2315
EM0011	015604	#47-2317 59-3115
EM0012	015664	#47-2319 59-3127 61-3258
EM0013	015762	#47-2321 61-3268
EM0014	016262	#47-2329 61-3288 62-3356
EM0015	016333	#47-2331 64-3504 64-3542 75-4619
EM0016	016432	#47-2333 68-3896 68-3934
EM0017	016723	#47-2339 73-4329 73-4364
EM0020	017020	#47-2341 75-4584
EM0023	017115	#47-2343 59-3134
EM0024	017200	#47-2345 59-3143 61-3279 62-3347
EM0027	017227	#47-2347
EM0030	017301	#47-2349 77-4746
EM0032	017473	#47-2353 79-4880
EM0033	016204	#47-2327
EM0034	017564	#47-2355 79-4911
EM0035	017655	#47-2357 58-3010
EM0112	016034	#47-2323 62-3326
EM0113	016132	#47-2325 62-3336
EM0115	016527	#47-2335 66-3701 66-3736
EM0116	016626	#47-2337 71-4092 71-4130
EM0130	017376	#47-2351 77-4753
END	023560	51-2645 #51-2714
ERRBLK	002230 G	#25-1253
ERRCNT	002236	#25-1263 *33-1545 33-1546 *51-2705
ERRMSG	002226 G	#25-1253
ERRNBR	002224 G	#25-1253
ERRTYP	002222 G	#25-1253
EVL	= 000004 G	#24-1191
EXADDR	012370	#26-1317
E\$END	= 002100	#19-1004
E\$LOAD	= 000035	#19-1004 20-1056
FLAG	002250	#25-1268 *64-3436 64-3539 *64-3543 *64-3549 64-3552 *66-3634 66-3733 *66-3737 *66-3743 66-3746 *68-3832 68-3931 *68-3935 *68-3941 68-3944 *71-4030 71-4127 *71-4131 *71-4137 71-4140 *73-4262 73-4361 *73-4365 *73-4371 73-4374 75-4616 *75-4620 *75-4626 75-4629
FTIME	002252	#25-1269 51-2633 *51-2637
F\$AU	= 000015	#19-1004 55-2882 55-2883
F\$AUTO	= 000020	#19-1004 52-2734 52-2762
F\$BGN	= 000040	#19-1004 19-1010 21-1077 49-2412 49-2419 49-2425 49-2442 49-2459 49-2471 49-2480 49-2488 49-2496 49-2506 49-2519 49-2530 49-2538 50-2555 51-2583 51-2706 51-2711 52-2734 53-2775 54-2816 55-2882 57-2952 57-2959 57-2969 57-2974 57-2976 58-2998 58-3012 58-3014 59-3070 59-3106 59-3112 59-3117 59-3124 59-3129 59-3136 59-3145 59-3151 61-3229 61-3230 61-3230 61-3249 61-3260 61-3270 61-3281 61-3290 61-3295 62-3298 62-3298 62-3317 62-3328 62-3338 62-3349 62-3358 62-3363 62-3364 64-3434 64-3493 64-3506 64-3555 64-3562 66-3632 66-3690 66-3703 66-3749 66-3756 68-3829 68-3887 68-3898 68-3947 68-3953 71-4027 71-4083 71-4094 71-4143 71-4149 73-4250 73-4319 73-4331 73-4377 73-4384 75-4506 75-4574 75-4586 75-4632 75-4639 77-4686 77-4749 77-4756 77-4762 79-4842 79-4856 79-4856 79-4874 79-4881 79-4884

SYMBOL CROSS REFERENCE CREF V02

SYMBOL	VALUE	REFERENCES								
		79-4887	79-4887	79-4905	79-4912	79-4915	79-4918	80-4939	81-4978	82-5016
		83-5035	83-5036	83-5036	83-5041	83-5042				
F\$CLEA	= 000007	#19-1004	53-2775	53-2802						
F\$DU	= 000016	#19-1004	54-2816	54-2856						
F\$END	= 000041	#19-1004	19-1004	19-1004	19-1004	19-1004	19-1004	19-1004	19-1004	19-1004
		19-1004	19-1004	19-1004	19-1004	19-1004	19-1004	19-1004	19-1004	19-1010
		49-2415	49-2422	49-2435	49-2451	49-2462	49-2474	49-2483	49-2491	49-2500
		49-2511	49-2521	49-2534	49-2541	50-2563	50-2572	51-2706	51-2711	51-2714
		52-2762	53-2802	54-2846	54-2856	55-2883	57-2952	57-2952	57-2952	57-2959
		57-2969	57-2974	57-2976	57-2976	58-2998	58-2998	58-2998	58-3012	58-3014
		58-3014	59-3070	59-3070	59-3070	59-3106	59-3112	59-3117	59-3124	59-3129
		59-3136	59-3145	59-3151	59-3151	61-3229	61-3229	61-3229	61-3230	61-3230
		61-3249	61-3260	61-3270	61-3281	61-3290	61-3295	61-3295	62-3298	62-3298
		62-3317	62-3328	62-3338	62-3349	62-3358	62-3363	62-3363	62-3364	62-3364
		64-3434	64-3434	64-3434	64-3493	64-3506	64-3555	64-3562	64-3562	66-3632
		66-3632	66-3632	66-3690	66-3703	66-3749	66-3756	66-3756	68-3829	68-3829
		68-3829	68-3887	68-3898	68-3947	68-3953	68-3953	71-4027	71-4027	71-4027
		71-4083	71-4094	71-4143	71-4149	71-4149	73-4250	73-4250	73-4250	73-4319
		73-4331	71-4377	73-4384	73-4384	75-4506	75-4506	75-4506	75-4574	75-4586
		75-4632	75-4639	75-4639	77-4686	77-4686	77-4686	77-4749	77-4756	77-4762
		77-4762	79-4842	79-4842	79-4842	79-4856	79-4856	79-4874	79-4881	79-4884
		79-4884	79-4887	79-4887	79-4905	79-4912	79-4915	79-4915	79-4918	79-4918
		80-4944	81-4990	82-5016	83-5035	83-5036	83-5041	83-5042		
F\$HARD	= 000004	#19-1004	80-4939	80-4944						
F\$HW	= 000013	#19-1004	23-1133	23-1150						
F\$INIT	= 000006	#19-1004	51-2583	51-2714						
F\$JMP	= 000050	#19-1004	50-2563	50-2563	51-2706	51-2711	54-2846	54-2846		
F\$MOD	= 000000	#19-1004	19-1010	82-5016						
F\$MSG	= 000011	#19-1004	49-2412	49-2415	49-2419	49-2422	49-2425	49-2435	49-2442	49-2451
		49-2459	49-2462	49-2471	49-2474	49-2480	49-2483	49-2488	49-2491	49-2496
		49-2500	49-2506	49-2511	49-2519	49-2521	49-2530	49-2534	49-2538	49-2541
F\$PROT	= 000021	#19-1004	21-1077	21-1099						
F\$PWR	= 000017	#19-1004								
F\$RPT	= 000012	#19-1004	50-2555	50-2572						
F\$SEG	= 000003	#19-1004								
F\$SOFT	= 000005	#19-1004	81-4978	81-4990						
F\$SRV	= 000010	#19-1004								
F\$SUB	= 000002	#19-1004	61-3230	61-3295	62-3298	62-3363	79-4856	79-4884	79-4887	79-4915
F\$SW	= 000014	#19-1004								
F\$TEST	= 000001	#19-1004	57-2952	57-2976	58-2998	58-3014	59-3070	59-3151	61-3229	62-3364
		64-3434	64-3562	66-3632	66-3756	68-3829	68-3953	71-4027	71-4149	73-4250
		73-4384	75-4506	75-4639	77-4686	77-4762	79-4842	79-4918		
GDDAT	002364	#26-1311								
GDREV	012430	#27-1352	58-3007							
GENER	013160	#35-1684	64-3448	66-3646	68-3843	71-4041	73-4272	75-4530		
GENER1	013302	35-1713	#35-1715							
GENEX	013440	35-1697	35-1700	35-1702	35-1704	35-1707	35-1711	35-1721	#35-1745	
GENINC	013432	35-1695	#35-1743							
GENISH	013310	*35-1712	*35-1714	35-1715	#35-1717					
GENO	025174	62-3343	62-3345	#62-3356						
GENOUT	024726	61-3275	61-3277	#61-3288						
GENRAN	013312	35-1694	#35-1718							

## SYMBOL CROSS REFERENCE

CREF V02

SYMBOL	VALUE	REFERENCES
GENROT	013266	35-1706 35-1709 #35-1712
GENRO	013254	35-1693 #35-1708
GENR1	013244	35-1692 #35-1705
GENSEL	013176	35-1687 #35-1688
GEN0	013216	35-1688 #35-1696
GEN1	013222	35-1689 #35-1698
GEN25	013236	35-1691 #35-1703
GEN52	013230	35-1690 #35-1701
GETPRM	023350	#51-2664
GOOD	002272	#26-1282 35-1743 *35-1745 35-1747 *38-1903 38-1905 *38-1917 *38-1918 38-1920 49-2413 49-2420 49-2460 49-2481 49-2489 49-2507 *59-3122 *79-4876 *79-4907
GOOD0	002274	#26-1283 *39-1947 39-1972 49-2426
GOOD1	002276	#26-1284
GOOD10	002306	#26-1288 *39-1951 39-1980 *40-2002 40-2031 49-2430 49-2446
GOOD12	002310	#26-1289 *39-1952 39-1982 *40-2003 40-2033 49-2431 49-2447
GOOD14	002312	#26-1290 *39-1953 39-1984 *40-2004 40-2035 49-2432 49-2448
GOOD16	002314	#26-1291 *39-1954 39-1986 *40-2005 40-2037 49-2433 49-2449
GOOD2	002300	#26-1285 *39-1948 39-1974 *40-1999 40-2025 49-2427 49-2443
GOOD4	002302	#26-1286 *39-1949 39-1976 *40-2000 40-2027 49-2428 49-2444
GOOD6	002304	#26-1287 *39-1950 39-1978 *40-2001 40-2029 49-2429 49-2445
G\$CNT0	= 000200	#19-1004
G\$DELM	= 000372	#19-1004
G\$DISP	= 000003	#19-1004
G\$EXCP	= 000400	#19-1004
G\$HILI	= 000002	#19-1004
G\$LOLI	= 000001	#19-1004
G\$NO	= 000000	#19-1004
G\$OFFS	= 000400	#19-1004 80-4941 80-4942 80-4943
G\$OFSI	= 000376	#19-1004 80-4941 80-4942 80-4943
G\$PRMA	= 000001	#19-1004 80-4941 80-4942
G\$PRMD	= 000002	#19-1004 80-4943
G\$PRML	= 000000	#19-1004
G\$RADA	= 000140	#19-1004
G\$RADB	= 000000	#19-1004
G\$RADD	= 000040	#19-1004
G\$RADL	= 000120	#19-1004
G\$RADO	= 000020	#19-1004 80-4941 80-4942 80-4943
G\$XFER	= 000004	#19-1004
G\$YES	= 000010	#19-1004 80-4941 80-4942 80-4943
HELP	= 000000	#19-991 20-1038 20-1059 21-1084 22-1111 23-1135 24-1165 24-1176 25-1226 25-1240 29-1428 50-2557 50-2565 51-2586 51-2609 52-2736 53-2778 53-2786 54-2820 54-2830 55-2873 56-2902 56-2909 56-2917 56-2925 56-2940 80-4946 81-4980 81-4993 82-5008 83-5022
HOE	= 100000	G #24-1191
IBE	= 010000	G #24-1191
IDU	= 000040	G #24-1191 33-1541
IER	= 020000	G #24-1191
INIFLG	012432	#28-1362
INTFLG	012372	#26-1318
INTTX	025250	#64-3442
ISR	= 000100	G #24-1191
IXE	= 004000	G #24-1191

SYMBOL CROSS REFERENCE

CREF V02

SYMBOL	VALUE	REFERENCES
I\$AU	= 000041	#19-1004 #55-2882 #55-2883
I\$AUTO	= 000041	#19-1004 #52-2734 #52-2762
I\$CLN	= 000041	#19-1004 #53-2775 #53-2802
I\$DU	= 000041	#19-1004 #54-2816 #54-2856
I\$HRD	= 000041	#80-4939 #80-4944
I\$INIT	= 000041	#19-1004 #51-2583 51-2706 51-2711 #51-2714
I\$MOD	= 000041	#19-1004 19-1010 #19-1010 82-5016 #82-5016
I\$MSG	= 000041	#19-1004 #49-2412 #49-2415 #49-2419 #49-2422 #49-2425 #49-2435 #49-2442 #49-2451 #49-2459 #49-2462 #49-2471 #49-2474 #49-2480 #49-2483 #49-2488 #49-2491 #49-2496 #49-2500 #49-2506 #49-2511 #49-2519 #49-2521 #49-2530 #49-2534 #49-2538 #49-2541
I\$PROT	= 000040	#19-1004 #21-1077
I\$PTAB	= 000041	#19-1004 83-5036 #83-5036 83-5041 #83-5041
I\$PWR	= 000041	#19-1004
I\$RPT	= 000041	#19-1004 #50-2555 #50-2572
I\$SEG	= 000041	#19-1004 57-2952 58-2998 59-3070 61-3229 61-3230 62-3298 64-3434 66-3632 68-3829 71-4027 73-4250 75-4506 77-4686 79-4842 79-4856 79-4887
I\$SETU	= 000041	#19-1004 83-5035 #83-5035 83-5036 83-5042 #83-5042
I\$SFT	= 000041	#81-4978 #81-4990
I\$SRV	= 000041	#19-1004
I\$SUB	= 000041	#19-1004 57-2952 58-2998 59-3070 61-3229 61-3230 #61-3230 61-3249 61-3260 61-3270 61-3281 61-3290 61-3295 #61-3295 #61-3295 62-3298 #62-3298 62-3317 62-3328 62-3338 62-3349 62-3358 62-3363 #62-3363 #62-3363 64-3434 66-3632 68-3829 71-4027 73-4250 75-4506 77-4686 79-4842 79-4856 #79-4856 79-4874 79-4881 79-4884 #79-4884 #79-4884 79-4887 #79-4887 79-4905 79-4912 79-4915
I\$TST	= 000041	#19-1004 57-2952 #57-2952 57-2959 57-2969 57-2974 57-2976 #57-2976 #57-2976 58-2998 #58-2998 58-3012 58-3014 #58-3014 #58-3014 59-3070 #59-3070 59-3106 59-3112 59-3117 59-3124 59-3129 59-3136 59-3145 59-3151 #59-3151 #59-3151 61-3229 #61-3229 61-3230 62-3298 62-3364 #62-3364 #62-3364 64-3434 #64-3434 64-3493 64-3506 64-3555 64-3562 #64-3562 #64-3562 66-3632 #66-3632 66-3690 66-3703 66-3749 66-3756 #66-3756 #66-3756 68-3829 #68-3829 68-3887 68-3898 68-3947 68-3953 #68-3953 #68-3953 71-4027 #71-4027 71-4083 71-4094 71-4143 71-4149 #71-4149 #71-4149 73-4250 #73-4250 73-4319 73-4331 73-4377 73-4384 #73-4384 #73-4384 75-4506 #75-4506 75-4574 75-4586 75-4632 75-4639 #75-4639 #75-4639 77-4686 #77-4686 77-4749 77-4756 77-4762 #77-4762 #77-4762 79-4842 #79-4842 79-4856 79-4887 79-4918 #79-4918 #79-4918 #79-4918
J\$JMP	= 000167	#19-1004 50-2563 54-2846
KB1.2	= 013224 G	#24-1201
KB56	= 000174 G	#24-1203 64-3440 66-3632 68-3836 71-4034 73-4265 75-4523
KB64	= 000154 G	#24-1202
KB68	= 000146 G	#24-1204
KB70	= 000143 G	#24-1205
KB72	= 000141 G	#24-1206
KIND	012404	#26-1325 *44-2189 #44-2190
KMTLVL	012452	#28-1381 #51-2701
KMVCSR	012454	#28-1382 38-1904 38-1919 39-1956 41-2055 41-2056 41-2062 42-2099 43-2129 #51-2666 52-2746 57-2953
KMVLVL	012442	#28-1377 #51-2700
KMVP02	012456	#28-1383 39-1958 40-2008 44-2187 45-2226 45-2240 #51-2668 #51-2669 64-3465 66-3663 68-3861 71-4059 73-4292 75-4547 79-4876 79-4907
KMVP04	012460	#28-1384 39-1960 40-2010 44-2189 45-2227 45-2241 45-2258 #51-2671 #51-2672 59-3121 64-3466 66-3664 68-3862 71-4060 73-4293 75-4548 79-4877 79-4908



## SYMBOL CROSS REFERENCE

CREF V02

SYMBOL	VALUE	REFERENCES
KMVP06	012462	#28-1385 39-1962 40-2012 45-2228 45-2242 *51-2674 *51-2675 59-3085 59-3088 59-3091 59-3096 61-3254 62-3322 64-3468 66-3666 68-3864 71-4062 73-4295 75-4550
KMVP10	012464	#28-1387 39-1964 40-2014 *51-2677 *51-2678 64-3502 66-3699 68-3894 71-4090 73-4327 75-4582 79-4878 79-4909
KMVP12	012466	#28-1388 39-1966 40-2016 *51-2680 *51-2681 64-3467 66-3665 68-3863 71-4061 73-4294 75-4549
KMVP14	012470	#28-1389 39-1968 40-2018 *51-2683 *51-2684 64-3464 66-3662 68-3860 71-4058 73-4291 75-4546
KMVP16	012472	#28-1390 39-1970 40-2020 *51-2686 *51-2687 64-3500 66-3697 68-3892 71-4088 73-4325 75-4580
KMVV00	012440	#28-1376 *51-2689
KMVV02	012446	#28-1379 *51-2691 *51-2692
KMVV04	012444	#28-1378 *51-2694 *51-2695
KMVV06	012450	#28-1380 *51-2697 *51-2698
KMV11B	002000	G #19-1010
LENGTH	012416	#26-1331 49-2498 *64-3438 64-3446 64-3455 64-3466 64-3517 *66-3636 66-3644 66-3653 66-3664 66-3711 *68-3838 68-3840 68-3849 68-3862 68-3905 *68-3913 68-3914 *71-4036 71-4038 71-4047 71-4060 71-4101 *71-4109 71-4110 *73-4267 73-4269 73-4279 73-4293 73-4339 *73-4346 73-4347 *75-4525 75-4527 75-4536 75-4548 75-4594 *75-4600 75-4601
LOCK	002232	#25-1261
LOE	= 040000	G #24-1191
LOGDEV	002240	#25-1264 52-2758
LOKFLG	012434	#28-1364
LOOP	012474	#28-1392 *44-2187 *44-2188 *51-2703 73-4253 75-4511 77-4690 79-4846
LOT	= 000010	G #24-1191
L\$ACP	002110	G #20-1056
L\$APT	002036	G #20-1056
L\$AU	023776	G #55-2882
L\$AUT	002070	G #20-1056
L\$AUTO	023620	G 20-1056 #52-2734
L\$CCP	002106	G #20-1056
L\$CLEA	023712	G 20-1056 #53-2775
L\$CO	002032	G #20-1056
L\$DEPO	002011	G #20-1056
L\$DESC	002174	G 20-1056 #25-1236
L\$DESP	002076	G #20-1056
L\$DEVP	002060	G #20-1056
L\$DISP	002132	G 20-1056 #22-1109
L\$DLY	002116	G #20-1056
L\$DTP	002040	G #20-1056
L\$DTYP	002034	G #20-1056
L\$DU	023716	G 20-1056 #54-2816
L\$DUT	002072	G #20-1056
L\$DVTY	012676	G 20-1056 #29-1421
L\$EF	002052	G #20-1056
L\$ENVI	002044	G #20-1056
L\$ERRT	002222	G #25-1253
L\$ETP	002102	G #20-1056
L\$EXP1	002046	G #20-1056
L\$EXP4	002064	G #20-1056

SYMBOL CROSS REFERENCE

CRE# V02

SYMBOL	VALUE		REFERENCES			
L\$EXPS	002066	G	#20-1056			
L\$HARD	031346	G	20-1056	80-4939	#80-4939	
L\$HIME	002120	G	#20-1056			
L\$HPCP	002016	G	#20-1056			
L\$HPTP	002022	G	#20-1056			
L\$HW	002164	G	20-1056	23-1133	#23-1133	
L\$ICP	002104	G	#20-1056			
L\$INIT	023130	G	20-1056	#51-2583		
L\$LADP	002026	G	#20-1056			
L\$LAST	032144	G	20-1056	#82-5015	83-5042	
L\$LOAD	002100	G	#20-1056			
L\$LUN	002074	G	#20-1056			
L\$MREV	002050	G	#20-1056			
L\$NAME	002000	G	#20-1056			
L\$PRIO	002042	G	#20-1056			
L\$PROT	002122	G	20-1056	#21-1077		
L\$PRT	002112	G	#20-1056			
L\$REPP	002062	G	#20-1056			
L\$REV	002010	G	#20-1056			
L\$RPT	023122	G	#50-2555			
L\$SOFT	031524	G	81-4978	#81-4978		
L\$SPC	002056	G	#20-1056			
L\$SPCP	002020	G	#20-1056			
L\$SPTP	002024	G	#20-1056			
L\$STA	002030	G	#20-1056			
L\$SW	002260		20-1056	#25-1272		
L\$TEST	002114	G	#20-1056			
L\$TIML	002014	G	#20-1056			
L\$UIT	002262		#25-1273	51-2653		
L\$UNIT	002012	G	#20-1056			
L10001	002174		23-1133	#23-1150		
L10002	021554		#49-2415			
L10003	021612		#49-2422			
L10004	022120		#49-2435			
L10005	022376		#49-2451			
L10006	022434		#49-2462			
L10007	022466		#49-2474			
L10010	022524		#49-2483			
L10011	022562		#49-2491			
L10012	022650		#49-2500			
L10013	022752		#49-2511			
L10014	023004		#49-2521			
L10015	023062		#49-2534			
L10016	023120		#49-2541			
L10017	023126		50-2563	#50-2572		
L10020	023560		51-2706	51-2711	#51-2714	
L10021	023710		#52-2762			
L10022	023714		#53-2802			
L10023	023774		54-2846	#54-2856		
L10024	023776		#55-2883			
L10025	024120		57-2959	57-2969	57-2974	#57-2976
L10026	024170		58-3012	#58-3014		

SYMBOL CROSS REFERENCE

CREF V02

SYMBOL	VALUE	REFERENCES
L10027	024500	59-3106 59-3112 59-3117 59-3124 59-3129 59-3136 59-3145 #59-3151
L10030	025216	#62-3364
L10031	024746	61-3249 61-3260 61-3270 61-3281 61-3290 #61-3295
L10032	025214	62-3317 62-3328 62-3338 62-3349 62-3358 #62-3363
L10033	025642	64-3493 64-3506 64-3555 #64-3562
L10034	026266	66-3690 66-3703 66-3749 #66-3756
L10035	026726	68-3887 68-3898 68-3947 #68-3953
L10036	027366	71-4083 71-4094 71-4143 #71-4149
L10037	030064	73-4319 73-4331 73-4377 #73-4384
L10040	030556	75-4574 75-4586 75-4632 #75-4639
L10041	031016	77-4749 77-4756 #77-4762
L10042	031342	#79-4918
L10043	031210	79-4874 79-4881 #79-4884
L10044	031340	79-4905 79-4912 #79-4915
L10045	031400	80-4939 #80-4944
L10046	031524	81-4978 #81-4990
L10047	032150	#83-5036
L10051	032160	83-5036 #83-5041
MAINM1	014502	#42-2099 44-2171 58-3000 59-3072 61-3232 62-3300 64-3437 66-3635 68-3831 71-4029 73-4261 75-4520 77-4699 79-4858 79-4889
MAINT0	= 054000	G #24-1196 41-2056
MAINT1	= 044000	G #24-1197 42-2099
MAXERR	002234	#25-1262 33-1546 33-1550
MAXPRI	= 000300	G #24-1195 36-1806 37-1875
MBSOLO	020556	#48-2379 49-2460
MCLR	= 040000	G #24-1198
MFRAM1	021043	#48-2390 49-2497
MFRAM2	021121	#48-2391 49-2498
MINT	020522	#48-2378 49-2420
MINTR	020620	#48-2381 49-2472
MLOOP	017736	#48-2363 73-4255 75-4513 77-4692 79-4849
MODEM1	021301	#48-2397 49-2507
MODEM2	021345	#48-2398 49-2508
MODEM3	021404	#48-2399 49-2509
MODEND	031016	77-4695 77-4740 #77-4761 79-4852
MODERA	030756	#77-4746
MODERB	030776	77-4719 #77-4753
MODWR1	030634	*77-4702 #77-4706
MODWR2	030710	*77-4723 #77-4727
MOD108	030622	77-4691 #77-4699
MRAMEF	021447	#48-2400 49-2520
MREG0	020062	#48-2367 49-2426
MREG10	020302	#48-2371 49-2430 49-2446
MREG12	020346	#48-2372 49-2431 49-2447
MREG14	020412	#48-2373 49-2432 49-2448
MREG16	020456	#48-2374 49-2433 49-2449
MREG2	020126	#48-2368 49-2427 49-2443
MREG4	020172	#48-2369 49-2428 49-2444
MREG6	020236	#48-2370 49-2429 49-2445
MSELO	020014	#48-2365 49-2413
MSTER1	021204	#48-2394 49-2531
MSTER2	021236	#48-2395 49-2532

SYMBOL CROSS REFERENCE

CREF V02

SYMBOL	VALUE	REFERENCES
MT11V	020761	#48-2389 49-2489
MVECT	020705	#48-2383 49-2481
NERRS	013032	33-1550 #33-1561
NEXT	023270	51-2648 #51-2652 51-2661
NUB	012420	#26-1332 *43-2128 43-2129
NUMBER	002360	#26-1309
O\$APTS	= 000000	#19-1004 20-1056
O\$AU	= 000000	#19-1004 20-1056
O\$BGNR	= 000000	#19-1004 20-1056
O\$BGNS	= 000000	#19-1004 20-1056
O\$DU	= 000001	#19-1004 #20-1034 20-1056
O\$ERRT	= 000000	#19-1004 20-1056
O\$GNSW	= 000001	#19-1004 #20-1034 20-1056
O\$POIN	= 000001	#19-1004 #20-1034 #20-1034 20-1034 20-1056
O\$SETU	= 000001	#19-1004 #20-1034 20-1056 82-5015
PADFLT	023064 G	#49-2538 57-2968
PBSELO	022400 G	#49-2459
PFRAME	022564 G	#49-2496 64-3542 66-3736 68-3934 71-4130 73-4364 75-4619
PINTR	022436 G	#49-2471 59-3123
PMODEM	022652 G	#49-2506 79-4880 79-4911
PNT	= 001000 G	#24-1191
PRALL	021614 G	41-2076 #49-2425
PRAMEF	022754 G	#49-2519 64-3548 66-3742 68-3940 71-4136 73-4370 75-4625
PRI	= 002000 G	#24-1191
PRINT	021556 G	#49-2419
PRIRTY	031466	80-4943 #80-4956
PRI00	= 000000 G	#24-1191
PRI01	= 000040 G	#24-1191
PRI02	= 000100 G	#24-1191
PRI03	= 000140 G	#24-1191
PRI04	= 000200 G	#24-1191
PRI05	= 000240 G	#24-1191
PRI06	= 000300 G	#24-1191
PRI07	= 000340 G	#24-1191
PRREG	022122 G	#49-2442
PRSELO	021520 G	42-2106 #49-2412
PRSTER	023006 G	#49-2530 64-3504 66-3701 68-3896 71-4092 73-4329 75-4584
PRT11V	022526 G	#49-2488
PSTACK	002242	#25-1265 *51-2632
PVECT	022470 G	#49-2480
QV.FLG	012435	#28-1365
RANCLC	013412	35-1731 35-1734 #35-1736
RANDN	002350	#26-1305 35-1720 35-1722 35-1729 *35-1739
RANEX	013430	#35-1742
RANGEN	013332	35-1719 #35-1722
RANMTA	002346	#26-1304 35-1730 35-1733
RANSEC	013416	35-1735 #35-1738
RANSEL	002344	#26-1303 #35-1718 35-1725 *35-1727 35-1728
RANST	002342	#26-1302 35-1724
RAN1	013344	35-1723 #35-1725
RAN2	013362	35-1726 #35-1728 35-1741
RAN4	013420	35-1737 #35-1739



SYMBOL CROSS REFERENCE

CREP V02

SYMBOL	VALUE	REFERENCES
		20-1056
		20-1056
		20-1056
		20-1056
		20-1056
		20-1056
		20-1056
		21-1077
		21-1077
		21-1077
		22-1109
		22-1109
		22-1109
		23-1133
		23-1133
		23-1133
		25-1236
		25-1236
		25-1236
		25-1236
		25-1253
		25-1253
		29-1421
		29-1421
		29-1421
		29-1421
		49-2419
		49-2419
		49-2425
		49-2425
		49-2425
		49-2425
		49-2442
		49-2442
		49-2442
		49-2459
		49-2459
		49-2471
		49-2471
		49-2471
		49-2480
		49-2480
		49-2480
		49-2488
		49-2488
		49-2496
		49-2496
		49-2496
		49-2506
		49-2506
		49-2506
		49-2519
		49-2519
		49-2530
		49-2530
		49-2530
		49-2538
		49-2538
		49-2538
		50-2555
		50-2555
		51-2583
		51-2583
		51-2583
		52-2734
		52-2734
		52-2734
		53-2775
		53-2775
		53-2775
		54-2816
		54-2816
		54-2816
		55-2882
		55-2882
		55-2882
		80-4939
		80-4939
		81-4978
		81-4978
		81-4978
		82-5015
		82-5015
		82-5015
		82-5015
		20-1056
		20-1056
		20-1056
		20-1056
		20-1056
		20-1056
		20-1056
		20-1056
		20-1056
		20-1056
		20-1056
		20-1056
		20-1056
		22-1109
		22-1109
		22-1109
		22-1109
		22-1109
		22-1109
		22-1109
		22-1109
		22-1109
		22-1109
		22-1109
		22-1109
		23-1133
		23-1133
		23-1133
		25-1236
		25-1236
		29-1421
		29-1421
		29-1421
		31-1478
		31-1478
		31-1478
		31-1492
		31-1492
		31-1492
		33-1536
		33-1536
		33-1536
		33-1550
		33-1550
		33-1550
		33-1550
		33-1550
		33-1550
		33-1550
		33-1550
		33-1551
		33-1551
		33-1551
		33-1551
		36-1805
		36-1805
		36-1805
		36-1806
		36-1806
		36-1806
		36-1817
		36-1817
		36-1817
		37-1874
		37-1874
		37-1874
		37-1875
		37-1875
		37-1875
		37-1886
		37-1886
		37-1886
		41-2076
		41-2076
		41-2076
		41-2076
		44-2183
		44-2183
		44-2183
		44-2183
		44-2183
		44-2183
		44-2183
		44-2183
		45-2254
		45-2254
		45-2254
		45-2254
		49-2413
		49-2413
		49-2413
		49-2413
		49-2413
		49-2413
		49-2413
		49-2413
		49-2413
		49-2420
		49-2420
		49-2420
		49-2420
		49-2420
		49-2420
		49-2420
		49-2420
		49-2422
		49-2422
		49-2422
		49-2426
		49-2426
		49-2426
		49-2426
		49-2426
		49-2426
		49-2426
		49-2426
		49-2427
		49-2427
		49-2427
		49-2427
		49-2427
		49-2427
		49-2427
		49-2427
		49-2428
		49-2428
		49-2428
		49-2428
		49-2428
		49-2428
		49-2428
		49-2428
		49-2429
		49-2429
		49-2429
		49-2429
		49-2429
		49-2429
		49-2429
		49-2429
		49-2430
		49-2430
		49-2430
		49-2430
		49-2430
		49-2430
		49-2430
		49-2430
		49-2431
		49-2431
		49-2431
		49-2431
		49-2431
		49-2431
		49-2431
		49-2431
		49-2432
		49-2432
		49-2432
		49-2432
		49-2432
		49-2432
		49-2432
		49-2432
		49-2433
		49-2433
		49-2433
		49-2433
		49-2433
		49-2433
		49-2433
		49-2433
		49-2435
		49-2443
		49-2443
		49-2443
		49-2443
		49-2443
		49-2443
		49-2443
		49-2444
		49-2444
		49-2444
		49-2444
		49-2444
		49-2444
		49-2444
		49-2444
		49-2445
		49-2445
		49-2445
		49-2445
		49-2445
		49-2445
		49-2445
		49-2445
		49-2446
		49-2446
		49-2446
		49-2446
		49-2446
		49-2446
		49-2446
		49-2446
		49-2447
		49-2447
		49-2447
		49-2447
		49-2447
		49-2447
		49-2447
		49-2447
		49-2448
		49-2448
		49-2448
		49-2448
		49-2448
		49-2448
		49-2448
		49-2448
		49-2448
		49-2448
		49-2449
		49-2449
		49-2449
		49-2449
		49-2449
		49-2449
		49-2449
		49-2449
		49-2460
		49-2460
		49-2460
		49-2460
		49-2460
		49-2460
		49-2460
		49-2460
		49-2472
		49-2472
		49-2472
		49-2472
		49-2472
		49-2472
		49-2472
		49-2472
		49-2474
		49-2474
		49-2474
		49-2481
		49-2481
		49-2481
		49-2481
		49-2481
		49-2481
		49-2481
		49-2481
		49-2489
		49-2489
		49-2489
		49-2489
		49-2489
		49-2489
		49-2489
		49-2489
		49-2491
		49-2497
		49-2497
		49-2497
		49-2497
		49-2497
		49-2497
		49-2497
		49-2498
		49-2498
		49-2498
		49-2498
		49-2498
		49-2498
		49-2498
		49-2498
		49-2507
		49-2507
		49-2507
		49-2507
		49-2507
		49-2507
		49-2507
		49-2507
		49-2509
		49-2509
		49-2509
		49-2509
		49-2509
		49-2509
		49-2509
		49-2509
		49-2520
		49-2520
		49-2520
		49-2520
		49-2520
		49-2520
		49-2520
		49-2520
		49-2531
		49-2531
		49-2531
		49-2531
		49-2531
		49-2531
		49-2531
		49-2531
		49-2532
		49-2532
		49-2532
		49-2532
		49-2532
		49-2532
		49-2532
		49-2532
		49-2534
		49-2539
		49-2539
		49-2539
		49-2539
		49-2539
		49-2539
		49-2539
		50-2563
		50-2563
		50-2563
		50-2572
		50-2572
		50-2572
		51-2625
		51-2625
		51-2625
		51-2625
		51-2625

SVCINS = 177777

SYMBOL CROSS REFERENCE

CREF V02

SYMBOL	VALUE	REFERENCES
		51-2625 51-2625 51-2625 51-2641 51-2641 51-2642 51-2644 51-2644 51-2645
		51-2647 51-2647 51-2648 51-2657 51-2657 51-2657 51-2657 51-2657 51-2657
		51-2660 51-2660 51-2660 51-2661 51-2706 51-2706 51-2710 51-2711 51-2711
		51-2714 52-2758 52-2758 52-2762 53-2800 53-2802 54-2844 54-2844 54-2844
		54-2844 54-2844 54-2844 54-2846 54-2846 54-2856 55-2883 57-2959 57-2959
		57-2968 57-2968 57-2968 57-2968 57-2969 57-2969 57-2974 57-2974 57-2976
		58-3010 58-3010 58-3010 58-3010 58-3012 58-3012 58-3014 59-3104 59-3104
		59-3104 59-3104 59-3106 59-3106 59-3110 59-3110 59-3110 59-3110 59-3112
		59-3112 59-3115 59-3115 59-3115 59-3115 59-3117 59-3117 59-3123 59-3123
		59-3123 59-3123 59-3124 59-3124 59-3127 59-3127 59-3127 59-3127 59-3129
		59-3129 59-3134 59-3134 59-3134 59-3134 59-3136 59-3136 59-3143 59-3143
		59-3143 59-3143 59-3145 59-3145 59-3151 61-3230 61-3247 61-3247 61-3247
		61-3247 61-3249 61-3249 61-3258 61-3258 61-3258 61-3258 61-3260 61-3260
		61-3268 61-3268 61-3268 61-3268 61-3270 61-3270 61-3279 61-3279 61-3279
		61-3279 61-3281 61-3281 61-3288 61-3288 61-3288 61-3288 61-3290 61-3290
		61-3295 62-3298 62-3315 62-3315 62-3315 62-3315 62-3317 62-3317 62-3326
		62-3326 62-3326 62-3326 62-3328 62-3328 62-3336 62-3336 62-3336 62-3336
		62-3338 62-3338 62-3347 62-3347 62-3347 62-3347 62-3349 62-3349 62-3356
		62-3356 62-3356 62-3356 62-3358 62-3358 62-3363 62-3364 64-3491 64-3491
		64-3491 64-3491 64-3493 64-3493 64-3504 64-3504 64-3504 64-3504 64-3506
		64-3506 64-3542 64-3542 64-3542 64-3542 64-3548 64-3548 64-3548 64-3548
		64-3555 64-3555 64-3562 66-3688 66-3688 66-3688 66-3688 66-3690 66-3690
		66-3701 66-3701 66-3701 66-3701 66-3703 66-3703 66-3736 66-3736 66-3736
		66-3736 66-3742 66-3742 66-3742 66-3742 66-3749 66-3749 66-3756 68-3842
		68-3885 68-3885 68-3885 68-3885 68-3887 68-3887 68-3896 68-3896 68-3896
		68-3896 68-3898 68-3898 68-3934 68-3934 68-3934 68-3934 68-3940 68-3940
		68-3940 68-3940 68-3947 68-3947 68-3953 71-4040 71-4081 71-4081 71-4081
		71-4081 71-4083 71-4083 71-4092 71-4092 71-4092 71-4092 71-4094 71-4094
		71-4130 71-4130 71-4130 71-4130 71-4136 71-4136 71-4136 71-4136 71-4143
		71-4143 71-4149 73-4255 73-4255 73-4255 73-4255 73-4255 73-4271 73-4317
		73-4317 73-4317 73-4317 73-4319 73-4319 73-4329 73-4329 73-4329 73-4329
		73-4331 73-4331 73-4364 73-4364 73-4364 73-4364 73-4370 73-4370 73-4370
		73-4370 73-4377 73-4377 73-4384 75-4513 75-4513 75-4513 75-4513 75-4513
		75-4529 75-4572 75-4572 75-4572 75-4572 75-4574 75-4574 75-4584 75-4584
		75-4584 75-4584 75-4586 75-4586 75-4619 75-4619 75-4619 75-4619 75-4625
		75-4625 75-4625 75-4625 75-4632 75-4632 75-4639 77-4692 77-4692 77-4692
		77-4692 77-4692 77-4746 77-4746 77-4746 77-4746 77-4749 77-4749 77-4753
		77-4753 77-4753 77-4753 77-4756 77-4756 77-4762 79-4849 79-4849 79-4849
		79-4849 79-4849 79-4856 79-4872 79-4872 79-4872 79-4872 79-4874 79-4874
		79-4880 79-4880 79-4880 79-4880 79-4881 79-4881 79-4884 79-4887 79-4903
		79-4903 79-4903 79-4903 79-4905 79-4905 79-4911 79-4911 79-4911 79-4911
		79-4912 79-4912 79-4915 79-4918 80-4939 80-4941 80-4941 80-4941 80-4941
		80-4942 80-4942 80-4942 80-4942 80-4943 80-4943 80-4943 80-4943 80-4943
		80-4944 81-4978 81-4990 82-5015 82-5015 82-5015 83-5036 83-5036 83-5036
SVCSUB = 177777		#19-1004 61-3230 61-3230 61-3230 61-3230 62-3298 62-3298 62-3298 79-4856
		79-4856 79-4856 79-4887 79-4887 79-4887 79-4887 79-4887 79-4887 79-4887
SVCTAG = 177777		#19-1004 23-1150 23-1150 23-1150 23-1150 49-2415 49-2415 49-2415 49-2422
		49-2422 49-2422 49-2435 49-2435 49-2435 49-2451 49-2451 49-2451 49-2462
		49-2462 49-2462 49-2474 49-2474 49-2474 49-2483 49-2483 49-2483 49-2491
		49-2491 49-2491 49-2500 49-2500 49-2500 49-2511 49-2511 49-2511 49-2521
		49-2521 49-2521 49-2534 49-2534 49-2534 49-2541 49-2541 49-2541 50-2572
		50-2572 50-2572 51-2714 51-2714 51-2714 52-2762 52-2762 52-2762 53-2802

SYMBOL CROSS REFERENCE

REF V02

SYMBOL	VALUE	REFERENCES
		53-2802 53-2802 54-2856 54-2856 54-2856 55-2883 55-2883 55-2883 57-2976
		57-2976 57-2976 58-2988 58-2992 58-3014 58-3014 58-3014 59-3027 59-3062
		59-3151 59-3151 59-3151 60-3167 60-3227 61-3295 61-3295 61-3295 62-3363
		62-3363 62-3363 62-3364 62-3364 62-3364 63-3377 63-3432 64-3562 64-3562
		64-3562 65-3575 65-3630 66-3756 66-3756 66-3756 67-3772 67-3827 68-3953
		68-3953 68-3953 70-3970 70-4025 71-4149 71-4149 71-4149 72-4162 72-4248
		73-4384 73-4384 73-4384 74-4397 74-4504 75-4639 75-4639 75-4639 76-4652
		76-4683 77-4762 77-4762 77-4762 78-4774 78-4838 79-4884 79-4884 79-4884
		79-4915 79-4915 79-4915 79-4918 79-4918 79-4918 80-4944 80-4944 80-4944
		81-4990 81-4990 81-4990 83-5036 83-5036 83-5036 83-5041 83-5041 83-5041
SVCTST	= 177777	#19-1004 #19-1016 57-2952 57-2952 57-2952 58-2998 58-2998 58-2998 59-3070
		59-3070 59-3070 61-3229 61-3229 61-3229 64-3434 64-3434 64-3434 66-3632
		66-3632 66-3632 68-3829 68-3829 68-3829 71-4027 71-4027 71-4027 73-4250
		73-4250 73-4250 75-4506 75-4506 75-4506 77-4686 77-4686 77-4686 79-4842
		79-4842 79-4842
S\$LSYM	= 010000	#19-1004 #23-1150 #49-2415 #49-2422 #49-2435 #49-2451 #49-2462 #49-2474 #49-2483
		#49-2491 #49-2500 #49-2511 #49-2521 #49-2534 #49-2541 #50-2572 #51-2714 #52-2762
		#53-2802 #54-2856 #55-2883 #57-2976 #58-3014 #59-3151 #61-3295 #62-3363 #62-3364
		#64-3562 #66-3756 #68-3953 #71-4149 #73-4384 #75-4639 #77-4762 #79-4884 #79-4915
		#79-4918 #80-4944 #81-4990
TFM36	015032	#47-2301 49-2539
TIM	015014	#47-2299 57-2968
TSPEED	012414	#26-1330 49-2498 *64-3440 64-3464 *66-3638 66-3662 *68-3836 68-3860 *71-4034
		71-4058 *73-4265 73-4291 *75-4523 75-4546
TSTERR	013102	#34-1591 44-2175 45-2248 59-3079 61-3239 62-3307 64-3483 66-3680 68-3877
		71-4073 73-4309 75-4564 79-4864 79-4895
TSTNUB	014552	#43-2128 44-2172 45-2230 45-2244 59-3073 61-3233 62-3301 64-3475 66-3672
		68-3869 71-4066 73-4301 75-4556 79-4859 79-4890
TTABLE	002370	#26-1314 64-3447 64-3465 64-3515 66-3645 66-3663 66-3709 68-3841 68-3861
		68-3903 71-4039 71-4059 71-4099 73-4270 73-4292 73-4337 75-4528 75-4547
		75-4592
TXABGN	027462	#73-4269 73-4348
TXATAR	027454	#73-4267 73-4350
TXDATA	012410	#26-1328 49-2497 49-2520 *64-3536 *66-3730 *68-3928 *71-4124 *73-4358 *75-4613
TXDBGN	030154	#75-4527 75-4602
TXDTAR	030146	#75-4525 75-4605
TXLBGN	026324	#68-3840 68-3915
TXLTAR	026316	#68-3838 68-3919
TXSTAR	025254	#64-3445 64-3527
T\$ARGC	= 000001	#20-1056 20-1056 #20-1056 20-1056 20-1056 #20-1056 20-1056 20-1056 #20-1056
		20-1056 20-1056 #20-1056 20-1056 20-1056 #20-1056 20-1056 20-1056 #20-1056
		20-1056 20-1056 #33-1550 33-1550 #33-1550 33-1550 #33-1550 33-1550 33-1550
		#49-2413 49-2413 #49-2413 49-2413 #49-2413 49-2413 49-2413 #49-2420 49-2420
		#49-2420 49-2420 #49-2420 49-2420 49-2420 #49-2426 49-2426 #49-2426 49-2426
		#49-2426 49-2426 49-2426 #49-2427 49-2427 #49-2427 49-2427 #49-2427 49-2427
		49-2427 #49-2428 49-2428 #49-2428 49-2428 49-2428 #49-2428 49-2428 49-2428 #49-2429
		49-2429 #49-2429 49-2429 #49-2429 49-2429 49-2429 #49-2430 49-2430 #49-2430 49-2430
		49-2430 #49-2430 49-2430 49-2430 #49-2431 49-2431 49-2431 #49-2431 49-2431 #49-2431
		49-2431 49-2431 #49-2432 49-2432 49-2432 #49-2432 49-2432 #49-2432 49-2432 49-2432
		#49-2433 49-2433 #49-2433 49-2433 49-2433 #49-2433 49-2433 49-2433 #49-2443 49-2443
		#49-2443 49-2443 #49-2443 49-2443 49-2443 #49-2444 49-2444 #49-2444 49-2444
		#49-2444 49-2444 49-2444 #49-2445 49-2445 #49-2445 49-2445 #49-2445 49-2445



SYMBOL CROSS REFERENCE

CREf V02

SYMBOL VALUE

REFERENCES

- T\$CODE = 002032
- T\$ERRN = 000055
  
  
  
  
  
  
  
  
  
  
  
- T\$EXCP = 000000
- T\$FLAG = 000040
  
  
  
  
  
  
  
  
  
  
  
- T\$FREE = 032160
- T\$GMAN = 000000
- T\$HILI = 000007
- T\$LAST = 000001
- T\$LOLI = 000004

49-2445	049-2446	49-2446	049-2446	49-2446	049-2446	49-2446	49-2446	049-2447
49-2447	049-2447	49-2447	049-2447	49-2447	049-2448	49-2448	049-2448	049-2448
49-2448	049-2448	49-2448	049-2448	049-2449	49-2449	049-2449	49-2449	049-2449
49-2449	49-2449	049-2460	49-2460	049-2460	49-2460	049-2460	49-2460	49-2460
049-2472	49-2472	049-2472	49-2472	49-2472	049-2481	49-2481	049-2481	49-2481
049-2481	49-2481	49-2481	049-2489	49-2489	049-2489	49-2489	049-2489	49-2489
49-2489	049-2497	49-2497	049-2497	49-2497	049-2497	49-2497	49-2497	049-2498
49-2498	049-2498	49-2498	049-2498	49-2498	49-2498	049-2507	49-2507	049-2507
49-2507	49-2507	049-2508	49-2508	049-2508	49-2508	49-2508	049-2509	49-2509
049-2509	49-2509	49-2509	049-2520	49-2520	049-2520	49-2520	049-2520	49-2520
49-2520	049-2531	49-2531	049-2531	49-2531	49-2531	049-2532	49-2532	049-2532
49-2532	49-2532	049-2539	49-2539	049-2539	49-2539	049-2539	49-2539	49-2539
051-2657	51-2657	051-2657	51-2657	51-2657	054-2844	54-2844	054-2844	54-2844
54-2844	073-4255	73-4255	73-4255	075-4513	75-4513	75-4513	077-4692	77-4692
77-4692	079-4849	79-4849	79-4849					
	080-4941	80-4941	080-4941	080-4941	80-4941	080-4942	80-4942	080-4942
	80-4942	080-4942	80-4942	080-4943	80-4943	80-4943	080-4943	80-4943
	019-1004	041-2076	41-2076	042-2106	42-2106	044-2183	44-2183	045-2254
	057-2968	57-2968	058-3010	58-3010	059-3104	59-3104	059-3110	59-3110
	59-3115	059-3123	59-3123	059-3127	59-3127	059-3134	59-3134	059-3143
	061-3247	61-3247	061-3258	61-3258	061-3268	61-3268	061-3279	61-3279
	61-3288	062-3315	62-3315	062-3326	62-3326	062-3336	62-3336	062-3347
	062-3356	62-3356	064-3491	64-3491	064-3504	64-3504	064-3542	64-3542
	64-3548	066-3688	66-3688	066-3701	66-3701	066-3736	66-3736	066-3742
	068-3885	68-3885	068-3896	68-3896	068-3934	68-3934	068-3940	68-3940
	71-4081	071-4092	71-4092	071-4130	71-4130	071-4136	71-4136	073-4317
	073-4329	73-4329	073-4364	73-4364	073-4370	73-4370	075-4572	75-4572
	75-4584	075-4619	75-4619	075-4625	75-4625	077-4746	77-4746	077-4753
	079-4872	79-4872	079-4880	79-4880	079-4903	79-4903	079-4911	79-4911
	080-4941	80-4941	080-4942	80-4942	080-4943	80-4943		
	050-2563	050-2563	50-2563	051-2706	051-2706	51-2706	51-2706	051-2711
	51-2711	51-2711	054-2846	054-2846	54-2846	057-2959	057-2959	57-2959
	057-2969	57-2969	057-2974	057-2974	57-2974	058-3012	058-3012	58-3012
	059-3106	59-3106	059-3112	059-3112	59-3112	059-3117	059-3117	59-3117
	059-3124	59-3124	059-3129	059-3129	59-3129	059-3136	059-3136	59-3136
	059-3145	59-3145	061-3249	061-3249	61-3249	061-3260	061-3260	61-3260
	061-3270	61-3270	061-3281	061-3281	61-3281	061-3290	061-3290	61-3290
	062-3317	62-3317	062-3328	062-3328	62-3328	062-3338	062-3338	62-3338
	062-3349	62-3349	062-3358	062-3358	62-3358	064-3493	064-3493	64-3493
	064-3506	64-3506	064-3555	064-3555	64-3555	066-3690	066-3690	66-3690
	066-3703	66-3703	066-3749	066-3749	66-3749	068-3887	068-3887	68-3887
	068-3898	68-3898	068-3947	068-3947	68-3947	071-4083	071-4083	71-4083
	071-4094	71-4094	071-4143	071-4143	71-4143	073-4319	073-4319	73-4319
	073-4331	73-4331	073-4377	073-4377	73-4377	075-4574	075-4574	75-4574
	075-4586	75-4586	075-4632	075-4632	75-4632	077-4749	077-4749	77-4749
	077-4756	77-4756	079-4874	079-4874	79-4874	079-4881	079-4881	79-4881
	079-4905	79-4905	079-4912	079-4912	79-4912			
	82-5015	083-5042						
	019-1004							
	080-4941	80-4941	080-4942	80-4942	080-4943	80-4943		
	019-1004	082-5015	83-5035					
	080-4941	80-4941	080-4942	80-4942	080-4943	80-4943		

SYMBOL CROSS REFERENCE

REF V02

SYMBOL	VALUE	REFERENCES
T\$LSYM	= 010000	019-1004 19-1004 23-1150 49-2415 49-2422 49-2435 49-2451 49-2462 49-2474 49-2483 49-2491 49-2500 49-2511 49-2521 49-2534 49-2541 50-2572 51-2714 52-2762 53-2802 54-2856 55-2883 57-2976 58-3014 59-3151 61-3295 62-3363 62-3364 64-3562 66-3756 68-3953 71-4149 73-4384 75-4639 77-4762 79-4884 79-4915 79-4918 80-4944 81-4990
T\$LTNO	= 000014	082-5015
T\$NEST	= 177777	019-1004 19-1010 019-1010 19-1010 21-1077 021-1077 21-1077 21-1099 21-1099 21-1099 021-1099 23-1133 023-1133 23-1133 23-1150 23-1150 23-1150 023-1150 49-2412 049-2412 49-2412 49-2415 49-2415 49-2415 049-2415 49-2419 049-2419 49-2419 49-2422 49-2422 49-2422 049-2422 49-2425 049-2425 49-2425 49-2435 49-2435 49-2435 049-2435 49-2442 049-2442 49-2442 49-2451 49-2451 49-2451 049-2451 49-2459 049-2459 49-2459 49-2462 49-2462 49-2462 049-2462 49-2471 049-2471 49-2471 49-2474 49-2474 49-2474 049-2474 49-2480 049-2480 49-2480 49-2483 49-2483 49-2483 049-2483 49-2488 049-2488 49-2488 49-2491 49-2491 49-2491 049-2491 49-2496 049-2496 49-2496 49-2500 49-2500 49-2500 049-2500 49-2506 049-2506 49-2506 49-2511 49-2511 49-2511 049-2511 49-2519 049-2519 49-2519 49-2521 49-2521 49-2521 049-2521 49-2530 049-2530 49-2530 49-2534 49-2534 49-2534 049-2534 49-2538 049-2538 49-2538 49-2541 49-2541 49-2541 049-2541 50-2555 050-2555 50-2555 50-2572 50-2572 50-2572 050-2572 51-2583 051-2583 51-2583 51-2714 51-2714 51-2714 051-2714 52-2734 052-2734 52-2734 52-2762 52-2762 52-2762 052-2762 53-2775 053-2775 53-2775 53-2802 53-2802 53-2802 053-2802 54-2816 054-2816 54-2816 54-2856 54-2856 54-2856 054-2856 55-2882 055-2882 55-2882 55-2883 55-2883 55-2883 055-2883 57-2952 057-2952 57-2952 57-2976 57-2976 57-2976 057-2976 58-2998 058-2998 58-2998 58-3014 58-3014 58-3014 058-3014 59-3070 059-3070 59-3070 59-3151 59-3151 59-3151 059-3151 61-3229 061-3229 61-3229 61-3230 061-3230 61-3230 61-3295 61-3295 61-3295 061-3295 62-3298 062-3298 62-3298 62-3298 62-3363 62-3363 62-3363 062-3363 62-3364 62-3364 62-3364 062-3364 64-3434 064-3434 64-3434 64-3562 64-3562 64-3562 064-3562 66-3632 066-3632 66-3632 66-3756 66-3756 66-3756 066-3756 68-3829 068-3829 68-3829 68-3953 68-3953 68-3953 068-3953 71-4027 071-4027 71-4027 71-4149 71-4149 71-4149 071-4149 73-4250 073-4250 73-4250 73-4384 73-4384 73-4384 073-4384 75-4506 075-4506 75-4506 75-4639 75-4639 75-4639 075-4639 77-4686 077-4686 77-4686 77-4762 77-4762 77-4762 077-4762 79-4842 079-4842 79-4842 79-4856 079-4856 79-4856 79-4884 79-4884 79-4884 079-4884 79-4887 079-4887 79-4887 79-4915 79-4915 79-4915 079-4915 79-4918 79-4918 79-4918 079-4918 80-4939 080-4939 80-4939 80-4944 80-4944 80-4944 080-4944 81-4978 081-4978 81-4978 81-4990 81-4990 81-4990 081-4990 82-5016 82-5016 82-5016 082-5016
T\$NS0	= 000000	019-1010 82-5016
T\$NS1	= 000005	021-1077 21-1099 023-1133 23-1150 049-2412 49-2415 049-2419 49-2422 049-2425 49-2435 049-2442 49-2451 049-2459 49-2462 049-2471 49-2474 049-2480 49-2483 049-2488 49-2491 049-2496 49-2500 049-2506 49-2511 049-2519 49-2521 049-2530 49-2534 049-2538 49-2541 050-2555 50-2572 051-2583 51-2714 052-2734 52-2762 053-2775 53-2802 054-2816 54-2856 055-2882 55-2883 057-2952 57-2976 058-2998 58-3014 059-3070 59-3151 061-3229 62-3364 064-3434 64-3562 066-3632 66-3756 068-3829 68-3953 071-4027 71-4149 073-4250 73-4384 075-4506 75-4639 077-4686 77-4762 079-4842 79-4918 080-4939 80-4944 081-4978 81-4990 079-4887 79-4915
T\$NS2	= 000002	061-3230 61-3295 062-3298 62-3363 079-4856 79-4884 079-4887 79-4915
T\$PCNT	= 000000	083-5035 83-5036 083-5036 83-5036
T\$PTAB	= 010050	083-5036 83-5036
T\$PTHV	= 000001	20-1056 083-5042
T\$PTNU	= 000001	019-1004 83-5036 083-5036 83-5042 83-5042



SYMBOL CROSS REFERENCE

REF V02

SYMBOL	VALUE	REFERENCES
T\$TEST	= 000014	80-4943 #80-4944 80-4944 #81-4990 81-4990 #82-5016 82-5016 #19-1004 57-2947 57-2950 57-2952 #57-2952 57-2952 58-2981 58-2983 58-2998 #58-2998 58-2998 59-3018 59-3020 #59-3070 59-3070 59-3070 60-3156 60-3158 61-3229 #61-3229 61-3229 61-3230 62-3298 63-3366 63-3369 64-3434 #64-3434 64-3434 65-3564 65-3567 66-3632 #66-3632 66-3632 67-3761 67-3764 68-3829 #68-3829 68-3829 70-3959 70-3962 71-4027 #71-4027 71-4027 72-4152 72-4155 73-4250 #73-4250 73-4250 74-4386 74-4389 75-4506 #75-4506 75-4506 76-4643 76-4645 77-4686 #77-4686 77-4686 78-4765 78-4767 79-4842 #79-4842 79-4842 79-4856 79-4887 82-5015
T\$TSTM	= 177777	#19-1004 31-1478 31-1492 33-1536 33-1540 33-1550 33-1551 33-1553 36-1805 36-1806 36-1817 37-1874 37-1875 37-1886 41-2076 42-2106 44-2183 45-2254 49-2413 49-2415 49-2420 49-2422 49-2426 49-2427 49-2428 49-2429 49-2430 49-2431 49-2432 49-2433 49-2435 49-2443 49-2444 49-2445 49-2446 49-2447 49-2448 49-2449 49-2451 49-2460 49-2462 49-2472 49-2474 49-2481 49-2483 49-2489 49-2491 49-2497 49-2498 49-2500 49-2507 49-2508 49-2509 49-2511 49-2520 49-2521 49-2531 49-2532 49-2534 49-2539 49-2541 50-2572 51-2625 51-2641 51-2644 51-2647 51-2657 51-2660 51-2706 51-2710 51-2711 51-2714 52-2758 52-2762 53-2800 53-2802 54-2844 54-2856 55-2883 57-2959 57-2968 57-2969 57-2974 57-2976 58-3010 58-3012 58-3014 59-3104 59-3106 59-3110 59-3112 59-3115 59-3117 59-3123 59-3124 59-3127 59-3129 59-3134 59-3136 59-3143 59-3145 59-3151 61-3230 61-3247 61-3249 61-3258 61-3260 61-3268 61-3270 61-3279 61-3281 61-3288 61-3290 61-3295 62-3298 62-3315 62-3317 62-3326 62-3328 62-3336 62-3338 62-3347 62-3349 62-3356 62-3358 62-3363 62-3364 64-3491 64-3493 64-3504 64-3506 64-3542 64-3548 64-3555 64-3562 66-3688 66-3690 66-3701 66-3703 66-3736 66-3742 66-3749 66-3756 68-3842 68-3885 68-3887 68-3896 68-3898 68-3934 68-3940 68-3947 68-3953 71-4040 71-4081 71-4083 71-4092 71-4094 71-4130 71-4136 71-4143 71-4149 73-4255 73-4271 73-4317 73-4319 73-4329 73-4331 73-4364 73-4370 73-4377 73-4384 75-4513 75-4529 75-4572 75-4574 75-4584 75-4586 75-4619 75-4625 75-4632 75-4639 77-4692 77-4746 77-4749 77-4753 77-4756 77-4762 79-4849 79-4856 79-4872 79-4874 79-4880 79-4881 79-4884 79-4887 79-4903 79-4905 79-4911 79-4912 79-4915 79-4918
T\$TSTS	= 000001	#19-1004 #57-2952 #58-2998 #59-3070 #61-3229 #64-3434 #66-3632 #68-3829 #71-4027 #73-4250 #75-4506 #77-4686 #79-4842
T\$\$AU	= 010024	#55-2882 55-2883
T\$\$AUT	= 010021	#52-2734 52-2762
T\$\$CLE	= 010022	#53-2775 53-2802
T\$\$DAT	= 010051	#83-5036 83-5036 83-5041
T\$\$DU	= 010023	#54-2816 54-2846 54-2856
T\$\$HAR	= 010045	#80-4939 80-4939 80-4944
T\$\$HW	= 010001	#23-1133 23-1133 23-1150
T\$\$INI	= 010020	#51-2583 51-2706 51-2711 51-2714
T\$\$MSG	= 010016	#49-2412 49-2415 #49-2419 49-2422 #49-2425 49-2435 #49-2442 49-2451 #49-2459 49-2462 #49-2471 49-2474 #49-2480 49-2483 #49-2488 49-2491 #49-2496 49-2500 #49-2506 49-2511 #49-2519 49-2521 #49-2530 49-2534 #49-2538 49-2541
T\$\$PC	= 000001	#83-5035 83-5042
T\$\$PRO	= 010000	#21-1077
T\$\$PTA	= 010050	#83-5035 83-5036 #83-5036
T\$\$RPT	= 010017	#50-2555 50-2563 50-2572
T\$\$SOF	= 010046	#81-4978 81-4978 81-4990
T\$\$SUB	= 010044	#61-3230 61-3249 61-3260 61-3270 61-3281 61-3290 61-3295 #62-3298 62-3317 62-3328 62-3338 62-3349 62-3358 #79-4856 79-4874 79-4881 79-4884

SYMBOL CROSS REFERENCE

CREF V02

SYMBOL	VALUE		REFERENCES
T\$\$TES	= 010042		#79-4887 79-4905 79-4912 79-4915 #57-2952 57-2959 57-2969 57-2974 57-2976 #58-2998 58-3012 58-3014 #59-3070 59-3106 59-3112 59-3117 59-3124 59-3129 59-3136 59-3145 59-3151 #61-3229 62-3364 #64-3434 64-3493 64-3506 64-3555 64-3562 #66-3632 66-3690 66-3703 66-3749 66-3756 #68-3829 68-3887 68-3898 68-3947 68-3953 #71-4027 71-4083 71-4094 71-4143 71-4149 #73-4250 73-4319 73-4331 73-4377 73-4384 #75-4506 75-4574 75-4586 75-4632 75-4639 #77-4686 77-4749 77-4756 77-4762 #79-4842 79-4918
T1	024000	G	22-1109 #57-2952
T10	030066	G	22-1109 #75-4506
T11	030560	G	22-1109 #77-4686
T12	031020	G	22-1109 #79-4842
T12.1	031062		#79-4856
T12.2	031212		#79-4887
T2	024122	G	22-1109 #58-2998
T3	024172	G	22-1109 #59-3070
T4	024502	G	22-1109 #61-3229
T4.1	024502		#61-3230
T4.2	024750		#62-3298
T5	025220	G	22-1109 #64-3434
T6	025644	G	22-1109 #66-3632
T7	026270	G	22-1109 #68-3829
T8	026730	G	22-1109 #71-4027
T9	027370	G	22-1109 #73-4250
UAM	= 000200	G	#24-1191
UNIT	002264		#25-1274 49-2539 *51-2656 51-2657 *57-2967
UUT	012436		#28-1367 33-1550 33-1551 *51-2650 *51-2652 51-2653 51-2656 51-2660 57-2967
VECT	012402		#26-1322 49-2481 49-2489 *59-3121
VECTOR	031432		80-4942 #80-4955
WAIT1	012726		#31-1490 31-1491 41-2057 43-2131 77-4710 77-4731
WAIT2	012706		#31-1475 31-1476 31-1481 42-2102 59-3076 61-3237 62-3305 64-3480 66-3677 68-3874 71-4070 73-4306 75-4561 79-4862 79-4893
WRDCNT	012426		#26-1335 49-2532 *64-3502 *66-3699 *68-3894 *71-4090 *73-4327 *75-4582
WRITE	014702		#45-2226 77-4706 77-4727
X\$ALWA	= 000000		#19-1004
X\$FALS	= 000040		#19-1004
X\$OFFS	= 000400		#19-1004
X\$TRUE	= 000020		#19-1004
\$LSTIN	= 000000		#19-1013
\$LSTTA	= 000000		#19-1014
\$PATCH	032000	G	#82-5005



MACRO CROSS REFERENCE

CREF V02

MACRO NAME	REFERENCES
EQUALS	24-1191
ERRHRD	41-2076 42-2106 44-2183 45-2254 57-2968 58-3010 59-3104 59-3110 59-3115 59-3123 59-3127 59-3134 59-3143 61-3247 61-3258 61-3268 61-3279 61-3288 62-3315 62-3326 62-3336 62-3347 62-3356 64-3491 64-3504 64-3542 64-3548 66-3688 66-3701 66-3736 66-3742 68-3885 68-3896 68-3934 68-3940 71-4081 71-4092 71-4130 71-4136 73-4317 73-4329 73-4364 73-4370 75-4572 75-4584 75-4619 75-4625 77-4746 77-4753 79-4872 79-4880 79-4903 79-4911
ERRTBL	25-1253
ESCAPE	57-2959 57-2969 57-2974 58-3012 59-3106 59-3112 59-3117 59-3124 59-3129 59-3136 59-3145 61-3249 61-3260 61-3270 61-3281 61-3290 62-3317 62-3328 62-3338 62-3349 62-3358 64-3493 64-3506 64-3555 66-3690 66-3703 66-3749 68-3887 68-3898 68-3947 71-4083 71-4094 71-4143 73-4319 73-4331 73-4377 75-4574 75-4586 75-4632 77-4749 77-4756 79-4874 79-4881 79-4905 79-4912
EXIT	50-2563 51-2706 51-2711 54-2846
GETPRI	36-1805 37-1874
GPHARD	51-2660
GPRMA	80-4941 80-4942
GPRMD	80-4943
HEADER	20-1056
INLOOP	33-1536
LASTAD	82-5015
M\$BYTE	20-1056 20-1056 20-1056
M\$CHEC	50-2563 50-2563 51-2706 51-2706 51-2711 51-2711 54-2846 54-2846
M\$CNTD	80-4941 80-4941 80-4942 80-4942 80-4943 80-4943
M\$COUN	33-1550 33-1550 33-1550 49-2413 49-2413 49-2413 49-2420 49-2420 49-2420 49-2426 49-2426 49-2426 49-2427 49-2427 49-2427 49-2428 49-2428 49-2428 49-2429 49-2429 49-2429 49-2430 49-2430 49-2430 49-2431 49-2431 49-2431 49-2432 49-2432 49-2432 49-2433 49-2433 49-2433 49-2443 49-2443 49-2443 49-2444 49-2444 49-2444 49-2445 49-2445 49-2445 49-2446 49-2446 49-2446 49-2447 49-2447 49-2447 49-2448 49-2448 49-2448 49-2449 49-2449 49-2449 49-2460 49-2460 49-2460 49-2472 49-2472 49-2481 49-2481 49-2481 49-2489 49-2489 49-2489 49-2497 49-2497 49-2497 49-2498 49-2498 49-2498 49-2507 49-2507 49-2508 49-2508 49-2509 49-2509 49-2509 49-2520 49-2520 49-2520 49-2531 49-2531 49-2532 49-2532 49-2539 49-2539 49-2539 51-2657 51-2657 54-2844 54-2844 73-4255 73-4255 75-4513 75-4513 77-4692 77-4692 79-4849 79-4849 20-1056 25-1236 29-1421 29-1421
M\$DATA	20-1056 20-1056
M\$DECR	21-1099 21-1099 23-1150 23-1150 49-2415 49-2415 49-2422 49-2422 49-2435 49-2435 49-2451 49-2451 49-2462 49-2462 49-2474 49-2474 49-2483 49-2483 49-2491 49-2491 49-2500 49-2500 49-2511 49-2511 49-2521 49-2521 49-2534 49-2534 49-2541 49-2541 50-2572 50-2572 51-2714 51-2714 52-2762 52-2762 53-2802 53-2802 54-2856 54-2856 55-2883 55-2883 57-2976 57-2976 58-3014 58-3014 59-3151 59-3151 61-3295 61-3295 62-3363 62-3363 62-3364 62-3364 64-3562 64-3562 66-3756 66-3756 68-3953 68-3953 71-4149 71-4149 73-4384 73-4384 75-4639 75-4639 77-4762 77-4762 79-4884 79-4884 79-4915 79-4915 79-4918 79-4918 80-4944 80-4944 81-4990 81-4990 82-5016 82-5016 83-5036 83-5036
M\$DEFA	80-4941 80-4941 80-4942 80-4942 80-4943 80-4943
M\$ENDE	23-1150 49-2415 49-2422 49-2435 49-2451 49-2462 49-2474 49-2483 49-2491 49-2500 49-2511 49-2521 49-2534 49-2541 50-2572 51-2714 52-2762 53-2802 54-2856 55-2883 57-2976 58-3014 59-3151 61-3295 62-3363 64-3562 66-3756 68-3953 71-4149

MACRO CROSS REFERENCE

CREF V02

MACRO NAME	REFERENCES										
M\$ERRI	#73-4384	#75-4639	#77-4762	#79-4884	#79-4915	#79-4918	#80-4944	#81-4990	#82-5016		
	#41-2076	41-2076	#42-2106	42-2106	#44-2183	44-2183	#45-2254	45-2254	#57-2968	57-2968	
	#58-3010	58-3010	#59-3104	59-3104	#59-3110	59-3110	#59-3115	59-3115	#59-3123	59-3123	
	#59-3127	59-3127	#59-3134	59-3134	#59-3143	59-3143	#61-3247	61-3247	#61-3258	61-3258	
	#61-3268	61-3268	#61-3279	61-3279	#61-3288	61-3288	#62-3315	62-3315	#62-3326	62-3326	
	#62-3336	62-3336	#62-3347	62-3347	#62-3356	62-3356	#64-3491	64-3491	#64-3504	64-3504	
	#64-3542	64-3542	#64-3548	64-3548	#66-3688	66-3688	#66-3701	66-3701	#66-3736	66-3736	
	#66-3742	66-3742	#68-3885	68-3885	#68-3896	68-3896	#68-3934	68-3934	#68-3940	68-3940	
	#71-4081	71-4081	#71-4092	71-4092	#71-4130	71-4130	#71-4136	71-4136	#73-4317	73-4317	
	#73-4329	73-4329	#73-4364	73-4364	#73-4370	73-4370	#75-4572	75-4572	#75-4584	75-4584	
	#75-4619	75-4619	#75-4625	75-4625	#77-4746	77-4746	#77-4753	77-4753	#79-4872	79-4872	
	#79-4880	79-4880	#79-4903	79-4903	#79-4911	79-4911					
	M\$ESCA	#57-2959	57-2959	#57-2969	57-2969	#57-2974	57-2974	#58-3012	58-3012	#59-3106	59-3106
		#59-3112	59-3112	#59-3117	59-3117	#59-3124	59-3124	#59-3129	59-3129	#59-3136	59-3136
		#59-3145	59-3145	#61-3249	61-3249	#61-3260	61-3260	#61-3270	61-3270	#61-3281	61-3281
		#61-3290	61-3290	#62-3317	62-3317	#62-3328	62-3328	#62-3338	62-3338	#62-3349	62-3349
		#62-3358	62-3358	#64-3493	64-3493	#64-3506	64-3506	#64-3555	64-3555	#66-3690	66-3690
		#66-3703	66-3703	#66-3749	66-3749	#68-3887	68-3887	#68-3898	68-3898	#68-3947	68-3947
		#71-4083	71-4083	#71-4094	71-4094	#71-4143	71-4143	#73-4319	73-4319	#73-4331	73-4331
		#73-4377	73-4377	#75-4574	75-4574	#75-4586	75-4586	#75-4632	75-4632	#77-4749	77-4749
#77-4756		77-4756	#79-4874	79-4874	#79-4881	79-4881	#79-4905	79-4905	#79-4912	79-4912	
M\$ESCS		#57-2959	#57-2969	#57-2974	#58-3012	#59-3106	#59-3112	#59-3117	#59-3124	#59-3129	#59-3136
	#59-3145	#61-3249	#61-3260	#61-3270	#61-3281	#61-3290	#62-3317	#62-3328	#62-3338	#62-3349	
	#62-3358	#64-3493	#64-3506	#64-3555	#66-3690	#66-3703	#66-3749	#68-3887	#68-3898	#68-3947	
	#71-4083	#71-4094	#71-4143	#73-4319	#73-4331	#73-4377	#75-4574	#75-4586	#75-4632	#77-4749	
	#77-4756	#79-4874	#79-4881	#79-4905	#79-4912						
M\$EXCP	#80-4941	80-4941	80-4941	#80-4942	80-4942	80-4942	#80-4943	80-4943	80-4943		
M\$EXIT	#50-2563	#51-2706	51-2706	#51-2711	51-2711	#54-2846					
M\$EXSE	#50-2563	#51-2706	#51-2711	#54-2846							
M\$EXTJ	#50-2563	50-2563	#51-2706	#51-2711	#54-2846	54-2846					
M\$GEN	#19-1010	19-1010	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	
	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	
	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	
	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	
	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	
	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	
	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	
	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	
	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	
	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	
	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	
	#22-1109	22-1109	#23-1133	23-1133	#23-1133	23-1133	#23-1150	23-1150	#25-1236	25-1236	
	#25-1253	25-1253	#29-1421	29-1421	#49-2412	49-2412	#49-2415	49-2415	#49-2419	49-2419	
	#49-2422	49-2422	#49-2425	49-2425	#49-2435	49-2435	#49-2442	49-2442	#49-2451	49-2451	
	#49-2459	49-2459	#49-2462	49-2462	#49-2471	49-2471	#49-2474	49-2474	#49-2480	49-2480	
	#49-2483	49-2483	#49-2488	49-2488	#49-2491	49-2491	#49-2496	49-2496	#49-2500	49-2500	
	#49-2506	49-2506	#49-2511	49-2511	#49-2519	49-2519	#49-2521	49-2521	#49-2530	49-2530	
	#49-2534	49-2534	#49-2538	49-2538	#49-2541	49-2541	#50-2555	50-2555	#50-2572	50-2572	
	#51-2583	51-2583	#51-2714	51-2714	#52-2734	52-2734	#52-2762	52-2762	#53-2775	53-2775	
	#53-2802	53-2802	#54-2816	54-2816	#54-2856	54-2856	#55-2882	55-2882	#55-2883	55-2883	
	#57-2952	57-2952	#57-2976	57-2976	#58-2998	58-2998	#58-3014	58-3014	#59-3070	59-3070	
	#59-3151	59-3151	#61-3229	61-3229	#61-3230	61-3230	#61-3295	61-3295	#62-3298	62-3298	
	#62-3363	62-3363	#62-3364	62-3364	#64-3434	64-3434	#64-3562	64-3562	#66-3632	66-3632	
	#66-3756	66-3756	#68-3829	68-3829	#68-3953	68-3953	#71-4027	71-4027	#71-4149	71-4149	
	#73-4250	73-4250	#73-4384	73-4384	#75-4506	75-4506	#75-4639	75-4639	#77-4686	77-4686	



MACRO CROSS REFERENCE

REF V02

MACRO NAME	REFERENCES									
M\$GETS	#77-4762	77-4762	#79-4842	79-4842	#79-4856	79-4856	#79-4884	79-4884	#79-4887	79-4887
	#79-4915	79-4915	#79-4918	79-4918	#80-4939	80-4939	#80-4944	80-4944	#81-4978	81-4978
	#81-4990	81-4990	#82-5015	82-5015	#83-5036	83-5036	#83-5041	83-5041		
	#21-1099	21-1099	#23-1150	23-1150	#49-2415	49-2415	#49-2422	49-2422	#49-2435	49-2435
	#49-2451	49-2451	#49-2462	49-2462	#49-2474	49-2474	#49-2483	49-2483	#49-2491	49-2491
	#49-2500	49-2500	#49-2511	49-2511	#49-2521	49-2521	#49-2534	49-2534	#49-2541	49-2541
	#50-2572	50-2572	#51-2714	51-2714	#52-2762	52-2762	#53-2802	53-2802	#54-2856	54-2856
	#55-2883	55-2883	#57-2976	57-2976	#58-3014	58-3014	#59-3151	59-3151	#61-3295	61-3295
	#62-3363	62-3363	#62-3364	62-3364	#64-3562	64-3562	#66-3756	66-3756	#68-3953	68-3953
	#71-4149	71-4149	#73-4384	73-4384	#75-4639	75-4639	#77-4762	77-4762	#79-4884	79-4884
M\$GETT	#79-4915	79-4915	#79-4918	79-4918	#80-4944	80-4944	#81-4990	81-4990	#82-5016	82-5016
	#50-2563	#51-2706	#51-2711	#54-2846	#57-2959	#57-2969	#57-2974	#58-3012	#59-3106	#59-3112
	#59-3117	#59-3124	#59-3129	#59-3136	#59-3145	#61-3249	#61-3260	#61-3270	#61-3281	#61-3290
	#62-3317	#62-3328	#62-3338	#62-3349	#62-3358	#64-3493	#64-3506	#64-3555	#66-3690	#66-3703
	#66-3749	#68-3887	#68-3898	#68-3947	#71-4083	#71-4094	#71-4143	#73-4319	#73-4331	#73-4377
	#75-4574	#75-4586	#75-4632	#77-4749	#77-4756	#79-4874	#79-4881	#79-4905	#79-4912	
	#19-1010	19-1010	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056
M\$GNGB	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056
	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056
	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056
	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056
	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056
	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056
	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056
	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056
	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056
	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056
#22-1109	22-1109	#23-1133	23-1133	23-1133	#25-1236	25-1236	#25-1253	25-1253	#29-1421	
M\$GNIN	29-1421	#49-2412	49-2412	#49-2419	49-2419	#49-2425	49-2425	#49-2442	49-2442	#49-2459
	49-2459	#49-2471	49-2471	#49-2480	49-2480	#49-2488	49-2488	#49-2496	49-2496	#49-2506
	49-2506	#49-2519	49-2519	#49-2530	49-2530	#49-2538	49-2538	#50-2555	50-2555	#51-2583
	51-2583	#52-2734	52-2734	#53-2775	53-2775	#54-2816	54-2816	#55-2882	55-2882	#80-4939
	80-4939	#81-4978	81-4978	#82-5015	82-5015					
	#20-1056	20-1056	20-1056	20-1056	20-1056	20-1056	20-1056	20-1056	20-1056	20-1056
	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	20-1056
	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	20-1056
	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	20-1056
	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	#20-1056	20-1056	20-1056

MACRO CROSS REFERENCE

CREF V02

MACRO NAME

REFERENCES

#49-2413	49-2413	#49-2413	49-2413	49-2413	#49-2413	49-2413	49-2413	#49-2415	49-2415
#49-2420	#49-2420	49-2420	#49-2420	49-2420	#49-2420	49-2420	#49-2420	49-2420	49-2420
#49-2420	49-2420	49-2420	#49-2422	49-2422	#49-2426	#49-2426	49-2426	#49-2426	49-2426
#49-2426	49-2426	#49-2426	49-2426	49-2426	#49-2426	49-2426	49-2426	#49-2427	#49-2427
49-2427	#49-2427	49-2427	#49-2427	49-2427	#49-2427	49-2427	49-2427	#49-2427	49-2427
49-2427	#49-2428	#49-2428	49-2428	#49-2428	49-2428	#49-2428	49-2428	#49-2428	49-2428
49-2428	#49-2428	49-2428	49-2428	#49-2429	#49-2429	49-2429	#49-2429	49-2429	#49-2429
49-2429	#49-2429	49-2429	49-2429	#49-2429	49-2429	49-2429	#49-2430	#49-2430	49-2430
#49-2430	49-2430	#49-2430	49-2430	#49-2430	49-2430	49-2430	#49-2430	49-2430	49-2430
#49-2431	#49-2431	49-2431	#49-2431	49-2431	#49-2431	49-2431	#49-2431	49-2431	49-2431
#49-2431	49-2431	49-2431	#49-2432	#49-2432	49-2432	#49-2432	49-2432	#49-2432	49-2432
#49-2432	49-2432	49-2432	#49-2432	49-2432	49-2432	#49-2433	#49-2433	49-2433	#49-2433
49-2433	#49-2433	49-2433	#49-2433	49-2433	49-2433	#49-2433	49-2433	49-2433	#49-2435
49-2435	#49-2443	#49-2443	49-2443	#49-2443	49-2443	#49-2443	49-2443	#49-2443	49-2443
49-2443	#49-2443	49-2443	49-2443	#49-2444	#49-2444	49-2444	#49-2444	49-2444	#49-2444
49-2444	#49-2444	49-2444	49-2444	#49-2444	49-2444	49-2444	#49-2445	#49-2445	49-2445
#49-2445	49-2445	#49-2445	49-2445	#49-2445	49-2445	49-2445	#49-2445	49-2445	49-2445
#49-2446	#49-2446	49-2446	#49-2446	49-2446	#49-2446	49-2446	#49-2446	49-2446	49-2446
#49-2446	49-2446	49-2446	#49-2447	#49-2447	49-2447	#49-2447	49-2447	#49-2447	49-2447
#49-2447	49-2447	49-2447	#49-2447	49-2447	49-2447	#49-2448	#49-2448	49-2448	#49-2448
49-2448	#49-2448	49-2448	#49-2448	49-2448	49-2448	#49-2448	49-2448	49-2448	#49-2449
#49-2449	49-2449	#49-2449	49-2449	#49-2449	49-2449	#49-2449	49-2449	49-2449	#49-2449
49-2449	49-2449	#49-2451	49-2451	#49-2460	#49-2460	49-2460	#49-2460	49-2460	#49-2460
49-2460	#49-2460	49-2460	49-2460	#49-2460	49-2460	49-2460	#49-2462	49-2462	#49-2472
#49-2472	49-2472	#49-2472	49-2472	#49-2472	49-2472	49-2472	#49-2472	49-2472	49-2472
#49-2474	49-2474	#49-2481	#49-2481	49-2481	#49-2481	49-2481	#49-2481	49-2481	#49-2481
49-2481	49-2481	#49-2481	49-2481	49-2481	#49-2483	49-2483	#49-2489	#49-2489	49-2489
#49-2489	49-2489	#49-2489	49-2489	#49-2489	49-2489	49-2489	#49-2489	49-2489	49-2489
#49-2491	49-2491	#49-2497	#49-2497	49-2497	#49-2497	49-2497	#49-2497	49-2497	#49-2497
49-2497	49-2497	#49-2497	49-2497	49-2497	#49-2498	#49-2498	49-2498	#49-2498	49-2498
#49-2498	49-2498	#49-2498	49-2498	49-2498	#49-2498	49-2498	49-2498	#49-2500	49-2500
#49-2507	#49-2507	49-2507	#49-2507	49-2507	#49-2507	49-2507	49-2507	#49-2507	49-2507
49-2507	#49-2508	#49-2508	49-2508	#49-2508	49-2508	#49-2508	49-2508	49-2508	#49-2508
49-2508	49-2508	#49-2509	#49-2509	49-2509	#49-2509	49-2509	#49-2509	49-2509	49-2509
#49-2509	49-2509	49-2509	#49-2511	49-2511	#49-2520	#49-2520	49-2520	#49-2520	49-2520
#49-2520	49-2520	#49-2520	49-2520	49-2520	#49-2520	49-2520	49-2520	#49-2521	49-2521
#49-2531	#49-2531	49-2531	#49-2531	49-2531	#49-2531	49-2531	49-2531	#49-2531	49-2531
49-2531	#49-2532	#49-2532	49-2532	#49-2532	49-2532	#49-2532	49-2532	49-2532	#49-2532
49-2532	49-2532	#49-2534	49-2534	#49-2539	#49-2539	49-2539	#49-2539	49-2539	#49-2539
49-2539	#49-2539	49-2539	49-2539	#49-2539	49-2539	49-2539	#49-2541	49-2541	#50-2563
50-2563	#50-2563	50-2563	#50-2572	50-2572	#51-2625	#51-2625	51-2625	#51-2625	51-2625
#51-2625	51-2625	#51-2625	51-2625	#51-2625	51-2625	51-2625	#51-2641	51-2641	#51-2641
51-2641	#51-2642	51-2642	#51-2644	51-2644	#51-2644	51-2644	#51-2645	51-2645	#51-2647
51-2647	#51-2647	51-2647	#51-2648	51-2648	#51-2657	#51-2657	51-2657	#51-2657	51-2657
#51-2657	51-2657	51-2657	#51-2657	51-2657	51-2657	#51-2660	51-2660	#51-2660	51-2660
#51-2660	51-2660	#51-2661	51-2661	#51-2706	51-2706	#51-2706	51-2706	#51-2710	51-2710
#51-2711	51-2711	#51-2711	51-2711	#51-2714	51-2714	#52-2758	52-2758	#52-2758	52-2758
#52-2762	52-2762	#53-2800	53-2800	#53-2802	53-2802	#54-2844	#54-2844	54-2844	#54-2844
54-2844	#54-2844	54-2844	54-2844	#54-2844	54-2844	54-2844	#54-2846	54-2846	#54-2846
54-2846	#54-2856	54-2856	#55-2883	55-2883	#57-2959	57-2959	#57-2959	57-2959	#57-2968
#57-2968	57-2968	#57-2968	57-2968	#57-2968	57-2968	#57-2968	57-2968	#57-2969	57-2969
#57-2969	57-2969	#57-2974	57-2974	#57-2974	57-2974	#57-2976	57-2976	#58-3010	#58-3010



MACRO CROSS REFERENCE

REF V02

MACRO NAME

REFERENCES

	#75-4529	75-4529	#75-4572	#75-4572	75-4572	#75-4572	75-4572	#75-4572	75-4572	#75-4572
	75-4572	#75-4574	75-4574	#75-4574	75-4574	#75-4584	#75-4584	75-4584	#75-4584	75-4584
	#75-4584	75-4584	#75-4584	75-4584	#75-4586	75-4586	#75-4586	75-4586	#75-4619	#75-4619
	75-4619	#75-4619	75-4619	#75-4619	75-4619	#75-4619	75-4619	#75-4625	#75-4625	75-4625
	#75-4625	75-4625	#75-4625	75-4625	#75-4625	75-4625	#75-4632	75-4632	#75-4632	75-4632
	#75-4639	75-4639	#77-4692	#77-4692	77-4692	#77-4692	77-4692	77-4692	#77-4692	77-4692
	77-4692	#77-4746	#77-4746	77-4746	#77-4746	77-4746	#77-4746	77-4746	#77-4746	77-4746
	#77-4749	77-4749	#77-4749	77-4749	#77-4753	#77-4753	77-4753	#77-4753	77-4753	#77-4753
	77-4753	#77-4753	77-4753	#77-4756	77-4756	#77-4756	77-4756	#77-4762	77-4762	#79-4849
	#79-4849	79-4849	#79-4849	79-4849	79-4849	#79-4849	79-4849	79-4849	#79-4856	79-4856
	#79-4872	#79-4872	79-4872	#79-4872	79-4872	#79-4872	79-4872	#79-4872	79-4872	#79-4874
	79-4874	#79-4874	79-4874	#79-4880	#79-4880	79-4880	#79-4880	79-4880	#79-4880	79-4880
	#79-4880	79-4880	#79-4881	79-4881	#79-4881	79-4881	#79-4884	79-4884	#79-4887	79-4887
	#79-4903	#79-4903	79-4903	#79-4903	79-4903	#79-4903	79-4903	#79-4903	79-4903	#79-4905
	79-4905	#79-4905	79-4905	#79-4911	#79-4911	79-4911	#79-4911	79-4911	#79-4911	79-4911
	#79-4911	79-4911	#79-4912	79-4912	#79-4912	79-4912	#79-4915	79-4915	#79-4918	79-4918
	#80-4939	80-4939	#80-4941	80-4941	80-4941	80-4941	80-4941	#80-4942	80-4942	80-4942
	80-4942	80-4942	#80-4943	80-4943	80-4943	80-4943	80-4943	80-4943	#80-4944	80-4944
	#81-4978	81-4978	#81-4990	81-4990	#82-5015	82-5015	82-5015	82-5015	#83-5036	#83-5036
	83-5036	83-5036								
M\$GNSU	#61-3230	61-3230	#62-3298	62-3298	#79-4856	79-4856	#79-4887	79-4887		
M\$GNTA	#23-1150	23-1150	#49-2415	49-2415	#49-2422	49-2422	#49-2435	49-2435	#49-2451	49-2451
	#49-2462	49-2462	#49-2474	49-2474	#49-2483	49-2483	#49-2491	49-2491	#49-2500	49-2500
	#49-2511	49-2511	#49-2521	49-2521	#49-2534	49-2534	#49-2541	49-2541	#50-2572	50-2572
	#51-2714	51-2714	#52-2762	52-2762	#53-2802	53-2802	#54-2856	54-2856	#55-2883	55-2883
	#57-2976	57-2976	#58-3014	58-3014	#59-3151	59-3151	#61-3295	61-3295	#62-3363	62-3363
	#62-3364	62-3364	#64-3562	64-3562	#66-3756	66-3756	#68-3953	68-3953	#71-4149	71-4149
	#73-4384	73-4384	#75-4639	75-4639	#77-4762	77-4762	#79-4884	79-4884	#79-4915	79-4915
	#79-4918	79-4918	#80-4944	80-4944	#81-4990	81-4990	#83-5036	83-5036	#83-5041	83-5041
M\$GNTE	#57-2952	57-2952	#58-2998	58-2998	#59-3070	59-3070	#61-3229	61-3229	#64-3434	64-3434
	#66-3632	66-3632	#68-3829	68-3829	#71-4027	71-4027	#73-4250	73-4250	#75-4506	75-4506
	#77-4686	77-4686	#79-4842	79-4842						
M\$HAPT	#20-1056	20-1056								
M\$HNAP	#20-1056	20-1056								
M\$INCR	#19-1010	19-1010	#21-1077	#21-1077	21-1077	21-1077	#23-1133	#23-1133	23-1133	23-1133
	#31-1478	#31-1492	#33-1536	#33-1540	#33-1550	#33-1551	#33-1553	#36-1805	#36-1806	#36-1817
	#37-1874	#37-1875	#37-1886	#41-2076	#42-2106	#44-2183	#45-2254	#49-2412	#49-2412	49-2412
	49-2412	#49-2413	#49-2415	#49-2419	#49-2419	49-2419	49-2419	#49-2420	#49-2422	#49-2425
	#49-2425	49-2425	49-2425	#49-2426	#49-2427	#49-2428	#49-2429	#49-2430	#49-2431	#49-2432
	#49-2433	#49-2435	#49-2442	#49-2442	49-2442	#49-2442	#49-2443	#49-2444	#49-2445	#49-2446
	#49-2447	#49-2448	#49-2449	#49-2451	#49-2459	#49-2459	49-2459	49-2459	#49-2460	#49-2462
	#49-2471	#49-2471	49-2471	49-2471	#49-2472	#49-2474	#49-2480	#49-2480	49-2480	49-2480
	#49-2481	#49-2483	#49-2488	#49-2488	49-2488	49-2488	#49-2489	#49-2491	#49-2496	#49-2496
	49-2496	49-2496	#49-2497	#49-2498	#49-2500	#49-2506	#49-2506	49-2506	49-2506	#49-2507
	#49-2508	#49-2509	#49-2511	#49-2519	#49-2519	49-2519	49-2519	#49-2520	#49-2521	#49-2530
	#49-2530	49-2530	49-2530	#49-2531	#49-2532	#49-2534	#49-2538	#49-2538	49-2538	49-2538
	#49-2539	#49-2541	#50-2555	#50-2555	50-2555	50-2555	#50-2572	#51-2583	#51-2583	51-2583
	51-2583	#51-2625	#51-2641	#51-2644	#51-2647	#51-2657	#51-2660	#51-2706	#51-2710	#51-2711
	#51-2714	#52-2734	#52-2734	52-2734	52-2734	#52-2758	#52-2762	#53-2775	#53-2775	53-2775
	53-2775	#53-2800	#53-2802	#54-2816	#54-2816	54-2816	54-2816	#54-2844	#54-2856	#55-2882
	#55-2882	55-2882	55-2882	#55-2883	#57-2952	#57-2952	57-2952	#57-2952	57-2952	57-2952
	#57-2959	#57-2968	#57-2969	#57-2974	#57-2976	#58-2998	#58-2998	58-2998	#58-2998	58-2998

MACRO CROSS REFERENCE

CREF V02

MACRO NAME	REFERENCES									
	58-2998	#58-3010	#58-3012	#58-3014	#59-3070	#59-3070	59-3070	#59-3070	59-3070	59-3070
	#59-3104	#59-3106	#59-3110	#59-3112	#59-3115	#59-3117	#59-3123	#59-3124	#59-3127	#59-3129
	#59-3134	#59-3136	#59-3143	#59-3145	#59-3151	#61-3229	#61-3229	61-3229	#61-3229	61-3229
	61-3229	#61-3230	61-3230	#61-3230	61-3230	61-3230	#61-3230	#61-3247	#61-3249	#61-3258
	#61-3260	#61-3268	#61-3270	#61-3279	#61-3281	#61-3288	#61-3290	#61-3295	#62-3298	62-3298
	#62-3298	62-3298	62-3298	#62-3298	#62-3315	#62-3317	#62-3326	#62-3328	#62-3336	#62-3338
	#62-3347	#62-3349	#62-3356	#62-3358	#62-3363	#62-3364	#64-3434	#64-3434	64-3434	#64-3434
	64-3434	64-3434	#64-3491	#64-3493	#64-3504	#64-3506	#64-3542	#64-3548	#64-3555	#64-3562
	#66-3632	#66-3632	66-3632	#66-3632	66-3632	66-3632	#66-3688	#66-3690	#66-3701	#66-3703
	#66-3736	#66-3742	#66-3749	#66-3756	#68-3829	#68-3829	68-3829	#68-3829	68-3829	68-3829
	#68-3842	#68-3885	#68-3887	#68-3896	#68-3898	#68-3934	#68-3940	#68-3947	#68-3953	#71-4027
	#71-4027	71-4027	#71-4027	71-4027	71-4027	#71-4040	#71-4081	#71-4083	#71-4092	#71-4094
	#71-4130	#71-4136	#71-4143	#71-4149	#73-4250	#73-4250	73-4250	#73-4250	73-4250	73-4250
	#73-4255	#73-4271	#73-4317	#73-4319	#73-4329	#73-4331	#73-4364	#73-4370	#73-4377	#73-4384
	#75-4506	#75-4506	75-4506	#75-4506	75-4506	75-4506	#75-4513	#75-4529	#75-4572	#75-4574
	#75-4584	#75-4586	#75-4619	#75-4625	#75-4632	#75-4639	#77-4686	#77-4686	77-4686	#77-4686
	77-4686	77-4686	#77-4692	#77-4746	#77-4749	#77-4753	#77-4756	#77-4762	#79-4842	#79-4842
	79-4842	#79-4842	79-4842	79-4842	#79-4849	#79-4856	79-4856	#79-4856	79-4856	79-4856
	#79-4856	#79-4872	#79-4874	#79-4880	#79-4881	#79-4884	#79-4887	79-4887	#79-4887	79-4887
	79-4887	#79-4887	#79-4903	#79-4905	#79-4911	#79-4912	#79-4915	#79-4918	#80-4939	#80-4939
	80-4939	80-4939	#81-4978	#81-4978	81-4978	81-4978	#83-5035	83-5035	#83-5036	83-5036
	83-5036	83-5036								
M\$LDRO	#33-1551	33-1551	#36-1806	36-1806	#36-1817	36-1817	#37-1875	37-1875	#37-1886	37-1886
	#51-2641	51-2641	#51-2644	51-2644	#51-2647	51-2647	#51-2660	51-2660	#52-2758	52-2758
M\$MCHI	#19-1004	19-1004								
M\$MCLO	#19-1004	19-1004								
M\$POP	#21-1099	21-1099	#23-1150	23-1150	#49-2415	49-2415	#49-2422	49-2422	#49-2435	49-2435
	#49-2451	49-2451	#49-2462	49-2462	#49-2474	49-2474	#49-2483	49-2483	#49-2491	49-2491
	#49-2500	49-2500	#49-2511	49-2511	#49-2521	49-2521	#49-2534	49-2534	#49-2541	49-2541
	#50-2572	50-2572	#51-2714	51-2714	#52-2762	52-2762	#53-2802	53-2802	#54-2856	54-2856
	#55-2883	55-2883	#57-2976	57-2976	#58-3014	58-3014	#59-3151	59-3151	#61-3295	61-3295
	#62-3363	62-3363	#62-3364	62-3364	#64-3562	64-3562	#66-3756	66-3756	#68-3953	68-3953
	#71-4149	71-4149	#73-4384	73-4384	#75-4639	75-4639	#77-4762	77-4762	#79-4884	79-4884
	#79-4915	79-4915	#79-4918	79-4918	#80-4944	80-4944	#81-4990	81-4990	#82-5016	82-5016
M\$PRIN	#33-1550	33-1550	#49-2413	49-2413	#49-2420	49-2420	#49-2426	49-2426	#49-2427	49-2427
	#49-2428	49-2428	#49-2429	49-2429	#49-2430	49-2430	#49-2431	49-2431	#49-2432	49-2432
	#49-2433	49-2433	#49-2443	49-2443	#49-2444	49-2444	#49-2445	49-2445	#49-2446	49-2446
	#49-2447	49-2447	#49-2448	49-2448	#49-2449	49-2449	#49-2460	49-2460	#49-2472	49-2472
	#49-2481	49-2481	#49-2489	49-2489	#49-2497	49-2497	#49-2498	49-2498	#49-2507	49-2507
	#49-2508	49-2508	#49-2509	49-2509	#49-2520	49-2520	#49-2531	49-2531	#49-2532	49-2532
	#49-2539	49-2539	#51-2657	51-2657	#54-2844	54-2844	#73-4255	73-4255	#75-4513	75-4513
	#77-4692	77-4692	#79-4849	79-4849						
M\$PUSH	#19-1010	19-1010	#21-1077	21-1077	#23-1133	23-1133	#49-2412	49-2412	#49-2419	49-2419
	#49-2425	49-2425	#49-2442	49-2442	#49-2459	49-2459	#49-2471	49-2471	#49-2480	49-2480
	#49-2488	49-2488	#49-2496	49-2496	#49-2506	49-2506	#49-2519	49-2519	#49-2530	49-2530
	#49-2538	49-2538	#50-2555	50-2555	#51-2583	51-2583	#52-2734	52-2734	#53-2775	53-2775
	#54-2816	54-2816	#55-2882	55-2882	#57-2952	57-2952	#58-2998	58-2998	#59-3070	59-3070
	#61-3229	61-3229	#61-3230	61-3230	#62-3298	62-3298	#64-3434	64-3434	#66-3632	66-3632
	#68-3829	68-3829	#71-4027	71-4027	#73-4250	73-4250	#75-4506	75-4506	#77-4686	77-4686
	#79-4842	79-4842	#79-4856	79-4856	#79-4887	79-4887	#80-4939	80-4939	#81-4978	81-4978
M\$PUT	#33-1550	33-1550	33-1550	33-1550	33-1550	#49-2413	49-2413	49-2413	49-2413	49-2413
	#49-2420	49-2420	49-2420	49-2420	49-2420	#49-2426	49-2426	49-2426	49-2426	49-2426

MACRO CROSS REFERENCE

CREF V02

MACRO NAME

REFERENCES

	049-2427	49-2427	49-2427	49-2427	49-2427	049-2428	49-2428	49-2428	49-2428	49-2428
	049-2429	49-2429	49-2429	49-2429	49-2429	049-2430	49-2430	49-2430	49-2430	49-2430
	049-2431	49-2431	49-2431	49-2431	49-2431	049-2432	49-2432	49-2432	49-2432	49-2432
	049-2433	49-2433	49-2433	49-2433	49-2433	049-2443	49-2443	49-2443	49-2443	49-2443
	049-2444	49-2444	49-2444	49-2444	49-2444	049-2445	49-2445	49-2445	49-2445	49-2445
	049-2446	49-2446	49-2446	49-2446	49-2446	049-2447	49-2447	49-2447	49-2447	49-2447
	049-2448	49-2448	49-2448	49-2448	49-2448	049-2449	49-2449	49-2449	49-2449	49-2449
	049-2460	49-2460	49-2460	49-2460	49-2460	049-2472	49-2472	49-2472	49-2472	049-2481
	49-2481	49-2481	49-2481	49-2481	049-2489	49-2489	49-2489	49-2489	49-2489	049-2497
	49-2497	49-2497	49-2497	49-2497	049-2498	49-2498	49-2498	49-2498	49-2498	049-2507
	49-2507	49-2507	49-2507	049-2508	49-2508	49-2508	49-2508	049-2509	49-2509	49-2509
	49-2509	049-2520	49-2520	49-2520	49-2520	49-2520	049-2531	49-2531	49-2531	49-2531
	049-2532	49-2532	49-2532	49-2532	049-2539	49-2539	49-2539	49-2539	49-2539	051-2625
	51-2625	51-2625	51-2625	51-2625	051-2657	51-2657	51-2657	51-2657	054-2844	54-2844
	54-2844	54-2844	073-4255	73-4255	73-4255	075-4513	75-4513	75-4513	077-4692	77-4692
	77-4692	079-4849	79-4849	79-4849						
M\$PUT1	033-1550	033-1550	033-1550	033-1550	33-1550	33-1550	33-1550	33-1550	049-2413	049-2413
	049-2413	049-2413	49-2413	49-2413	49-2413	49-2413	049-2420	049-2420	049-2420	049-2420
	49-2420	49-2420	49-2420	49-2420	049-2426	049-2426	049-2426	049-2426	49-2426	49-2426
	49-2426	49-2426	049-2427	049-2427	049-2427	049-2427	49-2427	49-2427	49-2427	49-2427
	049-2428	049-2428	049-2428	049-2428	49-2428	49-2428	49-2428	49-2428	049-2429	049-2429
	049-2429	049-2429	49-2429	49-2429	49-2429	49-2429	049-2430	049-2430	049-2430	049-2430
	49-2430	49-2430	49-2430	49-2430	049-2431	049-2431	049-2431	049-2431	49-2431	49-2431
	49-2431	49-2431	049-2432	049-2432	049-2432	049-2432	49-2432	49-2432	49-2432	49-2432
	049-2433	049-2433	049-2433	049-2433	49-2433	49-2433	49-2433	49-2433	049-2443	049-2443
	049-2443	049-2443	49-2443	49-2443	49-2443	49-2443	049-2444	049-2444	049-2444	049-2444
	49-2444	49-2444	49-2444	49-2444	049-2445	049-2445	049-2445	049-2445	49-2445	49-2445
	49-2445	49-2445	049-2446	049-2446	049-2446	049-2446	49-2446	49-2446	49-2446	49-2446
	049-2447	049-2447	049-2447	049-2447	49-2447	49-2447	49-2447	49-2447	049-2448	049-2448
	049-2448	049-2448	49-2448	49-2448	49-2448	49-2448	049-2449	049-2449	049-2449	049-2449
	49-2449	49-2449	49-2449	49-2449	049-2460	049-2460	049-2460	049-2460	49-2460	49-2460
	49-2460	49-2460	049-2472	049-2472	049-2472	49-2472	49-2472	49-2472	049-2481	049-2481
	049-2481	049-2481	49-2481	49-2481	49-2481	49-2481	049-2489	049-2489	049-2489	049-2489
	49-2489	49-2489	49-2489	49-2489	049-2497	049-2497	049-2497	049-2497	49-2497	49-2497
	49-2497	49-2497	049-2498	049-2498	049-2498	049-2498	49-2498	49-2498	49-2498	49-2498
	049-2507	049-2507	049-2507	49-2507	49-2507	49-2507	049-2508	049-2508	049-2508	49-2508
	49-2508	49-2508	049-2509	049-2509	049-2509	49-2509	49-2509	49-2509	049-2520	049-2520
	049-2520	049-2520	49-2520	49-2520	49-2520	49-2520	049-2531	049-2531	049-2531	49-2531
	49-2531	49-2531	049-2532	049-2532	049-2532	49-2532	49-2532	49-2532	049-2539	049-2539
	049-2539	049-2539	49-2539	49-2539	49-2539	49-2539	051-2625	051-2625	051-2625	051-2625
	51-2625	51-2625	51-2625	51-2625	051-2657	051-2657	051-2657	51-2657	51-2657	51-2657
	054-2844	054-2844	054-2844	54-2844	54-2844	54-2844	073-4255	073-4255	73-4255	73-4255
	075-4513	075-4513	75-4513	75-4513	077-4692	077-4692	77-4692	77-4692	079-4849	079-4849
	79-4849	79-4849								
M\$RADI	080-4941	80-4941	080-4942	80-4942	080-4943	80-4943				
M\$RNRO	033-1540	33-1540	036-1805	36-1805	037-1874	37-1874	051-2660	51-2660		
M\$SETS	019-1010	19-1010	021-1077	21-1077	023-1133	23-1133	049-2412	49-2412	049-2419	49-2419
	049-2425	49-2425	049-2442	49-2442	049-2459	49-2459	049-2471	49-2471	049-2480	49-2480
	049-2488	49-2488	049-2496	49-2496	049-2506	49-2506	049-2519	49-2519	049-2530	49-2530
	049-2538	49-2538	050-2555	50-2555	051-2583	51-2583	052-2734	52-2734	053-2775	53-2775
	054-2816	54-2816	055-2882	55-2882	057-2952	57-2952	058-2998	58-2998	059-3070	59-3070
	061-3229	61-3229	061-3230	61-3230	062-3298	62-3298	064-3434	64-3434	066-3632	66-3632