```
KARMA 03/14/81:==========================================================================
 ITEM    LOC    OBJECT CODE   SRC=CCWCP1 OBJ=GENWC2    9/11/1981 12:12 PM  PG   1
=========================================================================================
1  >>>>>        TEST KEY                                                          <<<<<<
  2 000000                     *************************************************************
  2 000000                     *                                                           *
  3 000000                     *    Test RAM,ROM,timer,PRT,CRT                             *
  3 000000                     *                                                           *
  3 000000                     *************************************************************
  4 000000 316 110 000 TEST.     JSB  =PWO            PWO test
  5 000003 117 310 300           CMB  R17,=300        if error, exit
  6 000006 373 074               JCY  TEND
  7 000010                     *************************************************************
  7 000010                     *                                                           *
  8 000010                     *    Graphics display 1's then 0's                          *
  8 000010                     *                                                           *
  8 000010                     *************************************************************
  9 000010 316 377 377 CTEST     JSB  =GRAPH.         switch to graphics
 10 000013 176 251 340           LDM  R76,=340,20     starting address
 10 000016 020
 11 000017 132 250 377           LDB  R32,=377
 12 000022 316 377 377           JSB  =ROMJSB
 13 000025 377 377               DEF  GCLR++          fill graphics with 1
 14 000027 001                   OCT  1
 15 000030 132 216               NCB  R32
 16 000032 316 377 377           JSB  =ROMJSB
 17 000035 377 377               DEF  GCLR++          fill graphics with 0
 18 000037 001                   OCT  1
 19 000040                     *************************************************************
 19 000040                     *
 20 000040                     *    Display 128 ASCII chars + ROM checksum
 20 000040                     *                                                           *
 20 000040                     *************************************************************
 21 000040 316 377 377           JSB  =ALPHA.         switch to alpha
 22 000043 316 377 377           JSB  =BLK&SC         blank line and scroll?
 23 000046 156 261 206           LDMD R56,=CRTBYT     rem CRT byte address
 23 000051 200
 24 000052 133 250 200           LDB  R33,=200        start with ASCII code=0
 25 000055 032 242     CTEST1    STB  R#,R32
 26 000057 316 377 377           JSB  =OUTCHR         display ASCII character
 27 000062 133 210               ICB  R33             increment ASCII code
 28 000064 372 367               JNC  CTEST1          repeat for 128 codes
 29 000066 126 251 276           LDM  R26,=TSTBUF     get ROM sum from buffer
 29 000071 203
 30 000072 136 251 002           LDM  R36,=002,000    byte count=2
 30 000075 000
 31 000076 316 377 377           JSB  =OUTSTR         display ROM checksum
 32 000101                     *************************************************************
 32 000101                     *                                                           *
 33 000101                     *    Print 128 ASCII chars + ROM checksum                   *
 34 000101                     *PTEST   LDM R36,R56         GET BYTE ADDR                  *
 35 000101                     *        LDB R25,=005        NUMBER OF LINES=5              *
 36 000101                     *        JSB =COPY+          COPY CRT TO PRT                *
 36 000101                     *                                                           *
 36 000101                     *************************************************************
 37 000101
 38 000101 316 377 377           JSB  =STBEEP         beep
```

```
  >>>>>       TEST KEY                                                      <<<<<<<<
   9 000104                       *******************************************************
  40 000104 262 000 377 TEND     STBD R#,=GINTEN      enable interrupts
  41 000107 236                  RTN
```

```
 43 000110                                                                    <<<<<<
 43 000110                  ******************************************************
 44 000110                  *
 44 000110                  *   Test RAM,ROM,PRT                                 *
 44 000110                  *                                                    *
 45 000110 230              ******************************************************
 45 000110 230             PWO      BIN
 46 000111 262 001 377              STBD R#,=GINTDS    disable interrupts
 47 000114 120 223                  CLM  R20           set err index = 0
 49 000116                 ******************************************************
 48 000116                 *
 49 000116                 *    RAM checkerboard test                           *
 49 000116                 *                                                    *
 49 000116                 ******************************************************
 50 000116 160 261 110              LDMD R60,=PWO      get data
 50 000121 000
 51 000122 175 251 000 RAM          LDM  R75,=0,200,0  get RAM start addr
 51 000125 200 000
 5  000127 263 314 377              STMD R75,=PTR2
  3 000132 170 271 314 RAM1         LDMI R70,=PTR2     save RAM data
 53 000135 377
 54 000136 160 273 314              STMI R60,=PTR2     write pattern to RAM
 54 000141 377
 55 000142 150 271 314              LDMI R50,=PTR2     read pattern from RAM
 55 000145 377
 56 000146 170 273 316              STMI R70,=PTR2+    restore RAM data
 56 000151 377
 57 000152 150 060 227              XRM  R50,R60       compare
 58 000155 366 063                  JNZ  ERR           if err,exit index=0
 59 000157 175 261 314              LDMD R75,=PTR2
 59 000162 377
 60 000163 321 000 200              CMMD R75,=FWUSER   repeat til end of RAM
 61 000166 372 342                  JNC  RAM1
 62 000170 132 223                  CLM  R32           (ROM start addr=0)
 63 000172 160 217                  NCM  R60
 64 000174 362 324                  JOD  RAM
 65 000176 263 062 211              STMD R60,=TMP1     for refresh check later
 6  000201                 ******************************************************
  6 000201                 *                                                    *
 67 000201                 *   ROM checksum                                     *
 67 000201                 *                                                    *
 67 000201                 ******************************************************
 68 000201 120 211         ROM      ICM  R20           index+1 (total=addr=0)
 69 000203 316 377 377              JSB  =RSUMSK       checksum ROMs 0,1,2,3
 70 000206 366 032                  JNZ  ERR           if err,exit,index=1-4
 71 000210 156 333                  ADMD R56,R#        add checksum to total
 72 000212 263 276 203              STMD R56,=TSTBUF   store total in buffer
 73 000215 132 211                  ICM  R32           get address of next ROM
 74 000217 211                      ICM  R32
 75 000220 361 357                  JNO  ROM           repeat til end of ROMS
 76 000222
 77 000222                 *******READ 1 BYTE FROM PRT ROM************************
 78 000222                 *PRT     LDM R44,=067,041,216,101
 79 000222                 *        STBD R44,=PRCHAR   SEND ASCII ADDR
```

```
 >>>>>        PWO TEST                                                           <<<<<<<<
  3 000222                    *         STBD R45,=PRSTS     SEND COLUMN#,READ ROM
 81 000222                    *         ANMD R47,=PRSTS     READ PRT STATUS
 82 000222                    *         CMB R47,=101        CHECK PRT,DATA READY=1
 83 000222                    *         JNZ ERR+1           IF ERR,EXIT,INDEX=5
 84 000222                    *         CMBD R46,=PRCHAR    READ PRT ROM,COMPARE
 85 000222                    *         JNZ ERR+2           IF ERR,EXIT,INDEX=6
 86 000222                    *         HED PWO TEST
 87 000222                    *******CHECK TAPE STATUS***************************
 88 000222                    *         LDBD R46,=TAPSTS    READ TAPE STATUS
 89 000222                    *         JOD TAPE
 90 000222                    *         JSB =SETOS          INVALID DIRECTORY,CLR ASN.
 91 000222                    *TAPE      LDM R20,=007,000   INDEX=7
 92 000222                    *         LDBD R23,=TAPSTS    TWICE TO MAKE SURE
 93 000222                    *         ANM R23,=246        CHECK STOP,GAP=1
 94 000222                    *         CMB R23,=240        CHECK STAL,ILIM=0
 95 000222                    *         JNZ ERR             IF ERR,EXIT,INDEX=7
 96 000222                    ***************************************************
  7 000222                    *
  8 000222                    ***************************************************
 98 000222                    *                                                 *
 99 000222                    *     Read key status                             *
 99 000222                    *                                                 *
 99 000222                    ***************************************************
100 000222 123 260 002                LDBD R23,=KEYSTS    check master enable=0
100 000225 377
101 000226 364 010                    JNG  ERR+1          if err,exit index=8
  2 000230                    ***************************************************
102 000230                    *                                                 *
103 000230                    *     Check RAM refresh                           *
103 000230                    *                                                 *
103 000230                    ***************************************************
104 000230 160 321 062 RAMF           CMMD R60,=TMP1      data still there?
104 000233 211
105 000234 367 017                    JZR  END            jif OK to end
106 000236 120 211     ERR+2          ICM  R20            index+1
107 000240 120 211     ERR+1          ICM  R20            index+1
1 3 000242 120 263 114 ERR            STMD R20,=ERLIN#    save index in ERLIN#
  3 000245 200
 09 000246 316 377 377                JSB =STBEEP         (beep anyway, may not
110 000251 316 377 377                JSB =ERROR           get to display error)
111 000254 027                        OCT 23D
112 000255 236         END            RTN
```

```
KARMA 03/14/81 ================================================================
 ITEM    LOC   OBJECT CODE  SRC=COWCP1 OBJ=GENWC2   9/11/1981 12:12 PM  PG  5
================================================================================
>>>>>      ENTRIES AND EXTERNALS                                          <<<<<<<
 114 000256                        ENT PWO
 115 000256                        ENT TEST.
 116 000256                        EXT RSUM8K
 117 000256                        EXT GRAPH.
 118 000256                        EXT SET0S
 119 000256                        EXT GCLR++
 120 000256                        EXT ALPHA.
 121 000256                        EXT BLK&SC
 122 000256                        EXT OUTCHR
 123 000256                        EXT OUTSTR
 124 000256                        EXT COPY+
 125 000256                        EXT ROMJSB
 126 000256                        EXT STBEEP
 127 000256                        EXT ERROR
 128 000256               *        UNIL FOR FIN
 129 000256                        FIN
```

A[illegible]HA.	177777	EXT	1	
[illegible]%SC	177777	EXT	1	
C [illegible]+	177777	EXT	0	<--- NOT REFERENCED??
CRTBYT	100206	G DAD	1	
CTEST	000010	LCL	0	<--- NOT REFERENCED??
CTEST1	000055	LCL	1	
END	000255	LCL	1	
ERLIN#	100114	G DAD	1	
ERR	000242	LCL	2	
ERR+1	000240	LCL	1	
ERR+2	000236	LCL	0	<--- NOT REFERENCED??
ERROR	177777	EXT	1	
FWUSER	100000	G DAD	1	
GCLR++	177777	EXT	2	
GINTDS	177401	G DAD	1	
GINTEN	177400	G DAD	1	
GRAPH.	177777	EXT	1	
KEYSTS	177402	G DAD	1	
OUTCHR	177777	EXT	1	
OU[illegible]STR	177777	EXT	1	
P[illegible]2	177714	G DAD	5	
P[illegible]R2+	177716	G DAD	1	
PWO	000110	ENT	3	
RAM	000122	LCL	1	
RAM1	000132	LCL	1	
RAMF	000230	LCL	0	<--- NOT REFERENCED??
RON	000201	LCL	1	
RONJSB	177777	EXT	2	
R[illegible]SK	177777	EXT	1	
SE[illegible]OS	177777	EXT	0	<--- NOT REFERENCED??
STBEEP	177777	EXT	2	
TEND	000104	LCL	1	
TEST.	000000	ENT	1	
TMP1	104462	G DAD	2	
TSTBUF	101676	G DAD	2	

CCWCP1 HAD 0 ERRORS 0 WARNINGS 35 LABELS LAST ERROR AT 0