

VS11,  
VSV11-LU

COLOUR LOOKUP OPTION  
CZVSVAO

AH-T550A-MC  
FICHE 1 OF 1

OCT 1983  
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MADE IN USA



A grid of approximately 12 columns and 15 rows of small, illegible data tables or charts. Each cell contains a small table with multiple columns and rows of text, likely representing technical specifications or data points. The text is too small to be read accurately.



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IDENTIFICATION  
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PRODUCT CODE: AC-T549A-MC  
 PRODUCT NAME: CZVSVA0 COLOUR LOOKUP OPTION  
 PRODUCT DATE: 16-MARCH-1983  
 MAINTAINER: C.S.S. READING U.K.  
 AUTHOR: PAUL TAYLOR  
 HISTORY: MODIFIED FROM Z185F.MAC

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## 1.0 GENERAL INFORMATION

### 1.1 PROGRAM ABSTRACT

THIS PROGRAM CHECKS THE FUNCTIONALITY OF THE VSV11/VS11 COLOR LOOK-UP TABLE. THE PROGRAM IS SPLIT UP INTO THREE TESTS AS FOLLOWS:-  
 TEST 1. LOGIC TESTS  
 TEST 2. MAINTENANCE REGISTER READ/WRITE TEST  
 TEST 3. ANALOG VERIFICATION TESTS  
 TEST 4. BAR/DOT GENERATION (STAND ALONE)

THIS DIAGNOSTIC HAS BEEN WRITTEN FOR USE WITH THE DIAGNOSTIC RUNTIME SERVICES SOFTWARE (SUPERVISOR). THESE SERVICES PROVIDE THE INTERFACE TO THE OPERATOR AND TO THE SOFTWARE ENVIRONMENT. THIS PROGRAM CAN BE USED WITH XXDP+, ACT, APT, SLIDE AND PAPER TAPE. FOR A COMPLETE DESCRIPTION OF THE RUNTIME SERVICES, REFER TO THE XXDP+ USER'S MANUAL. THERE IS A BRIEF DESCRIPTION OF THE RUNTIME SERVICES IN SECTION 2 OF THIS DOCUMENT.

### 1.2 SYSTEM REQUIREMENTS

- A. PDP-11 PROCESSOR WITH 24K OR MORE OF MEMORY
- B. CONSOLE TERMINAL WITH INTERFACE ADDRESS 777560
- C. XXDP+ SUPPORTED LOAD DEVICE OR PAPER TAPE SUPERVISOR
- D. VSV11/VS11
- E. COLOR DISPLAY MONITOR OR B/W MONITOR

### 1.3 RELATED DOCUMENTS AND STANDARDS

XXDP+ USERS MANUAL CHQUS

### 1.4 DIAGNOSTIC HIERARCY PREREQUISITES

BEFORE RUNNING THIS DIAGNOSTIC THE VSV11/VS11 SHOULD BE CHECKED USING ITS RELEVANT DIAGNOSTICS

### 1.5 ASSUMPTIONS

TO GET THE FULL 256 COLOR DISPLAY, THE VSV11/VS11 WILL NEED TO BE CONFIGURED USING TWO MEMORY PLANES NON-INTERLACED OR FOUR MEMORY PLANES INTERLACED.

## 2.0 OPERATING INSTRUCTIONS

THIS SECTION CONTAINS A BRIEF DESCRIPTION OF THE RUNTIME SERVICES. FOR DETAILED INFORMATION, REFER TO THE XXDP+ USER'S MANUAL (CHQUS).

### 2.1 COMMANDS

THERE ARE ELEVEN LEGAL COMMANDS FOR THE DIAGNOSTIC RUNTIME SERVICES (SUPERVISOR). THIS SECTION LISTS THE COMMANDS AND GIVES A VERY BRIEF DESCRIPTION OF THEM. THE XXDP+ USER'S MANUAL HAS MORE DETAILS.

COMMAND	EFFECT
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139	START	START THE DIAGNOSTIC FROM AN INITIAL STATE
140	RESTART	START THE DIAGNOSTIC WITHOUT INITIALIZING
141	CONTINUE	CONTINUE AT TEST THAT WAS INTERRUPTED (AFTER ^C)
142	PROCEED	CONTINUE FROM AN ERROR HALT
143	EXIT	RETURN TO XXDP+ MONITOR (XXDP+ OPERATION ONLY!)
144	ADD	ACTIVATE A UNIT FOR TESTING (ALL UNITS ARE
145		CONSIDERED TO BE ACTIVE AT START TIME
146	DROP	DEACTIVATE A UNIT
147	PRINT	PRINT STATISTICAL INFORMATION (IF IMPLEMENTED
148		BY THE DIAGNOSTIC - SECTION 4.0)
149	DISPLAY	TYPE A LIST OF ALL DEVICE INFORMATION
150	FLAGS	TYPE THE STATE OF ALL FLAGS (SEE SECTION 2.3)
151	ZFLAGS	CLEAR ALL FLAGS (SEE SECTION 2.3)

A COMMAND CAN BE RECOGNIZED BY THE FIRST THREE CHARACTERS. SO YOU MAY, FOR EXAMPLE, TYPE 'STA' INSTEAD OF 'START'.

2.2 SWITCHES

THERE ARE SEVERAL SWITCHES WHICH ARE USED TO MODIFY SUPERVISOR OPERATION. THESE SWITCHES ARE APPENDED TO THE LEGAL COMMANDS. ALL OF THE LEGAL SWITCHES ARE TABULATED BELOW WITH A BRIEF DESCRIPTION OF EACH. IN THE DESCRIPTIONS BELOW, A DECIMAL NUMBER IS DESIGNATED BY 'DDDD'.

SWITCH	EFFECT
-----	-----
/TESTS:LIST	EXECUTE ONLY THOSE TESTS SPECIFIED IN THE LIST. LIST IS A STRING OF TEST NUMBERS, FOR EXAMPLE - /TESTS:1:5:7-10. THIS LIST WILL CAUSE TESTS 1,5,7,8,9,10 TO BE RUN. ALL OTHER TESTS WILL NOT BE RUN.
/PASS:DDDD	EXECUTE DDDDD PASSES (DDDD = 1 TO 64000)
/FLAGS:FLGS	SET SPECIFIED FLAGS. FLAGS ARE DESCRIBED IN SECTION 2.3.
/EOP:DDDD	REPORT END OF PASS MESSAGE AFTER EVERY DDDDD PASSES ONLY. (DDDD = 1 TO 64000)
/UNITS:LIST	TEST/ADD/DROP ONLY THOSE UNITS SPECIFIED IN THE LIST. LIST EXAMPLE - /UNITS:0:5:10-12 USE UNITS 0,5,10,11,12 (UNIT NUMBERS = 0-63)

EXAMPLE OF SWITCH USAGE:

START/TESTS:1-5/PASS:1000/EOP:100

THE EFFECT OF THIS COMMAND WILL BE: 1) TESTS 1 THROUGH 5 WILL BE EXECUTED, 2) ALL UNITS WILL TESTED 1000 TIMES AND 3) THE END OF PASS MESSAGES WILL BE PRINTED AFTER EACH 100 PASSES ONLY. A SWITCH CAN BE RECOGNIZED BY THE FIRST THREE CHARACTERS. YOU MAY, FOR EXAMPLE, TYPE '/TES:1-5' INSTEAD OF '/TESTS:1-5'.

BELOW IS A TABLE THAT SPECIFIES WHICH SWITCHES CAN BE USED BY EACH COMMAND.

	TESTS	PASS	FLAGS	EOP	UNITS
	-----	-----	-----	-----	-----
START	X	X	X	X	X

194

```

195 RESTART X X X X X
196 CONTINUE X X X
197 PROCEED X
198 DROP X
199 ADD X
200 PRINT
201 DISPLAY X
202 FLAGS
203 ZFLAGS
204 EXIT

```

2.3 FLAGS

FLAGS ARE USED TO SET UP CERTAIN OPERATIONAL PARAMETERS SUCH AS LOOPING ON ERROR. ALL FLAGS ARE CLEARED AT STARTUP AND REMAIN CLEARED UNTIL EXPLICITLY SET USING THE FLAGS SWITCH. FLAGS ARE ALSO CLEARED AFTER A START COMMAND UNLESS SET USING THE FLAG SWITCH. THE ZFLAGS COMMAND MAY ALSO BE USED TO CLEAR ALL FLAGS. WITH THE EXCEPTION OF THE START AND ZFLAGS COMMANDS, NO COMMANDS AFFECT THE STATE OF THE FLAGS; THEY REMAIN SET OR CLEARED AS SPECIFIED BY THE LAST FLAG SWITCH.

FLAG	EFFECT
HOE	HALT ON ERROR - CONTROL IS RETURNED TO RUNTIME SERVICES COMMAND MODE
LOE	LOOP ON ERROR
IER*	INHIBIT ALL ERROR REPORTS
IBR*	INHIBIT ALL ERROR REPORTS EXCEPT FIRST LEVEL (FIRST LEVEL CONTAINS ERROR TYPE, NUMBER, PC, TEST AND UNIT)
IXR*	INHIBIT EXTENDED ERROR REPORTS (THOSE CALLED BY PRINTX MACRO'S)
PRI	DIRECT MESSAGES TO LINE PRINTER
PNT	PRINT TEST NUMBER AS TEST EXECUTES
BOE	'BELL' ON ERROR
UAM	UNATTENDED MODE (NO MANUAL INTERVENTION)
ISR	INHIBIT STATISTICAL REPORTS (DOES NOT APPLY TO DIAGNOSTICS WHICH DO NOT SUPPORT STATISTICAL REPORTING)
IDR	INHIBIT PROGRAM DROPPING OF UNITS
ADR	EXECUTE AUTODROP CODE
LOT	LOOP ON TEST
EVL	EXECUTE EVALUATION (ON DIAGNOSTICS WHICH HAVE EVALUATION SUPPORT)

\*ERROR MESSAGES ARE DESCRIBED IN SECTION 3.1

SEE THE XXDP+ USER'S MANUAL FOR MORE DETAILS ON FLAGS. YOU MAY SPECIFY MORE THAN ONE FLAG WITH THE FLAG SWITCH. FOR EXAMPLE, TO CAUSE THE PROGRAM TO LOOP ON ERROR, INHIBIT ERROR REPORTS AND TYPE A 'BELL' ON ERROR, YOU MAY USE THE FOLLOWING STRING:

/FLAGS:LOE:IER:BOE

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#### 2.4 HARDWARE QUESTIONS

WHEN A DIAGNOSTIC IS STARTED, THE RUNTIME SERVICES WILL PROMPT THE USER FOR HARDWARE INFORMATION BY TYPING "CHANGE HW (L) ?" YOU MUST ANSWER "Y" AFTER A START COMMAND UNLESS THE HARDWARE INFORMATION HAS BEEN "PRELOADED" USING THE SETUP UTILITY (SEE CHAPTER 6 OF THE XXDP+ USER'S MANUAL). WHEN YOU ANSWER THIS QUESTION WITH A "Y", THE RUNTIME SERVICES WILL ASK FOR THE NUMBER OF UNITS (IN DECIMAL). YOU WILL THEN BE ASKED THE FOLLOWING QUESTIONS FOR EACH UNIT.

#UNITS (D) ?

TYPE IN THE NUMBER OF VS11/COLOR LOOKUP TABLE COMBINATIONS ON THE SYSTEM.

UNIT 0  
LUT CSR ADDRESS (O) 172020 ?

TYPE <CR> TO US DEFAULT ADDRESS FOR FIRST DEVICE  
OR TYPE IN CORRECT CSR ADDRESS <CR>.  
THIS SHOULD BE AN OCTAL NUMBER IN RANGE 160000-177776

LUT INTERRUPT VECTOR(O) 340 ?

TYPE <CR> OR CORRECT VECTOR ADDRESS <CR>  
THIS SHOULD BE AN OCTAL NUMBER IN RANGE 000-377

INTERRUPT PRIORITY (O) 4 ?

TYPE <CR> OR CORRECT PRIORITY LEVEL <CR>

VS11 1ST BUS ADDRESS (O) 172010 ?

TYPE <CR> OR CORRECT ADDRESS <CR>

VS11 INTERRUPT VECTOR (O) 320 ?

TYPE <CR> OR CORRECT VECTOR <CR>

IF MORE THAN ONE UNIT IS TO BE TESTED, THE RUNTIME SERVICES WILL PROMPT FOR THE ABOVE INFORMATION FOR EACH SUBSEQUENT UNIT.

#### 2.5 SOFTWARE QUESTIONS

AFTER YOU HAVE ANSWERED THE HARDWARE QUESTIONS OR AFTER A RESTART OR CONTINUE COMMAND, THE RUNTIME SERVICES WILL ASK FOR SOFTWARE PARAMETERS. THESE PARAMETERS WILL GOVERN SOME DIAGNOSTIC SPECIFIC OPERATION MODES. YOU WILL BE PROMPTED BY "CHANGE SW (L) ?" IF YOU WISH TO CHANGE ANY PARAMETERS, ANSWER BY TYPING "Y". THE SOFTWARE QUESTIONS AND THE DEFAULT VALUES ARE DESCRIBED IN THE NEXT PARAGRAPH(S).

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TOLERANCE TESTING REQUIRED ?  
ANSWER Y(ES) FOR TOLLERANCE N(O) FOR GO-NOGO TEST (L) Y ?

TEST 3 OF THE DIAGNOSTIC CHECKS ANALOG OUTPUTS OF RED, GREEN, BLUE AND COMPOSIT VIDEO AGAINST AN EXPECTED VALUE FOR DIFFERENT INPUTS. THE GO-NOGO TEST WILL ONLY ENSURE THAT THE ANALOG VALUES CROSS OVER ALL THE THRESHOLDS WHEREAS THE TOLERANCE TEST ENSURES THAT THE REFERENCE THRESHOLDS ARE EXCEEDED WITH THE CORRECT LEVEL OF INPUT THE NORMAL DE'FAULT TO THIS QUESTION IS Y(ES) TO FULLY TEST THE COLOR L.U.T. ANALOG OUTPUT CIRCUITS.

## 2.6 QUICK START-UP PROCEDURE (XXDP+)

TO START-UP THIS PROGRAM:

1. ROOT XXDP+
2. GIVE THE DATE AND ANSWER THE LSI AND 50HZ (IF THERE IS A CLOCK) QUESTIONS
3. TYPE 'R NAME', WHERE NAME IS THE NAME OF THE BIN OR BIC FILE FOR THIS PROGRAM
4. TYPE "START"
5. ANSWER THE "CHANGE HW" QUESTION WITH 'Y'
6. ANSWER ALL THE HARDWARE QUESTIONS
7. ANSWER THE "CHANGE SW" QUESTION WITH 'N'

WHEN YOU FOLLOW THIS PROCEDURE YOU WILL BE USING ONLY THE DEFAULTS FOR FLAGS AND SOFTWARE PARAMETERS. THESE DEFAULTS ARE DESCRIBED IN SECTIONS 2.3 AND 2.5.

## 3.0 ERROR INFORMATION

### 3.1 TYPES OF ERROR MESSAGES

THERE ARE THREE LEVELS OF ERROR MESSAGES THAT MAY BE ISSUED BY A DIAGNOSTIC: GENERAL, BASIC AND EXTENDED. GENERAL ERROR MESSAGES ARE ALWAYS PRINTED UNLESS THE "IER" FLAG IS SET (SECTION 2.3). THE GENERAL ERROR MESSAGE IS OF THE FORM:

```
NAME TYPE NUMBER ON UNIT NUMBER TST NUMBER PC:XXXXXX
ERROR MESSAGE
```

WHERE: NAME = DIAGNOSTIC NAME  
TYPE = ERROR TYPE (SYS FATAL, DEV FATAL, HARD OR SOFT)  
NUMBER = ERROR NUMBER  
UNIT NUMBER = 0 - N (N IS LAST UNIT IN PTABLE)  
TST NUMBER = TEST AND SUBTEST WHERE ERROR OCCURRED  
PC:XXXXXX = ADDRESS OF ERROR MESSAGE CALL

BASIC ERROR MESSAGES ARE MESSAGES THAT CONTAIN SOME ADDITIONAL INFORMATION ABOUT THE ERROR. THESE ARE ALWAYS PRINTED UNLESS THE "IER" OR "IBR" FLAGS ARE SET (SECTION 2.3). THESE MESSAGES

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ARE PRINTED AFTER THE ASSOCIATED GENERAL MESSAGE.

EXTENDED ERROR MESSAGES CONTAIN SUPPLEMENTARY ERROR INFORMATION SUCH AS REGISTER CONTENTS OR GOOD/BAD DATA. THESE ARE ALWAYS PRINTED UNLESS THE 'IER', 'IBR' OR 'IXR' FLAGS ARE SET (SECTION 2.3). THESE MESSAGES ARE PRINTED AFTER THE ASSOCIATED GENERAL ERROR MESSAGE AND ANY ASSOCIATED BASIC ERROR MESSAGES.

3.2 SPECIFIC ERROR MESSAGES

0000 UNEXPECTED DISPLAY PROCESSOR UNIT TIME-OUT.

0001 NON-EXISTANT DEVICE ADDRESS  
ADDRESS: NNNNNN

00101 LUT READ INTERRUPT EXPECTED, NOT RECEIVED.

00102 LUT WRITE INTERRUPT EXPECTED, NOT RECEIVED.

00103 UNEXPECTED LUT READ INTERRUPT

00104 UNEXPECTED LUT WRITE INTERRUPT

00105 LUT AUTO-INCREMENT INCORRECT ON READ

00106 LUT AUTO-INCREMENT INCORRECT ON WRITE

00107 LUT DATA INCORRECT (AFTER CLEAR SET FUNCTION)  
CSR NNNNNN EXP'D NNNNNN REC'D NNNNNN

00108 LUT DATA INCORRECT (AFTER LOADING GREYSCALE TABLE)  
CSR NNNNNN EXP'D NNNNNN REC'D NNNNNN

00201 LUT MAINTENANCE REGISTER READ/WRITE ERROR.  
MAINT REG NNNNNN EXP'D NNNNNN REC'D NNNNNN

00301 XXX DATA ERROR  
INPUT REQUIRED TO EXCEED THRESHOLD INCORRECT  
GAMMA CORRECTION IS ZZ  
THRESHOLD: 0.07V 0.42V 1.00V 1.35V  
EXPECTED: NNNN NNNN NNNN NNNN  
RECEIVED: NNNN NNNN NNNN NNNN

WHERE XXX = RED, GREEN, BLUE OR COMPOSITE  
ZZ = 'ON' OR 'OFF'  
NNNN = OCTAL NUMBER

00302 XXX DAC ERROR  
FAILED TO CROSS ALL MAINTENANCE THRESHOLDS  
GAMMA CORRECTION IS ZZ  
THRESHOLD: 0.07V 0.42V 1.00V 1.35V  
EXPECTED: NNNN NNNN NNNN NNNN  
RECEIVED: NNNN NNNN NNNN NNNN

ERROR REPORT 301 IS USED IF ANSWER TO SOFTWARE QUESTION IS 'Y' TOLERANCE TESTING  
ERROR 302 IS USED IF ANSWER IS 'N' GO-NOGO TEST

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#### 4.0 PERFORMANCE AND PROGRESS REPORTS

AT THE END OF EACH PASS, THE PASS COUNT IS GIVEN ALONG WITH THE TOTAL NUMBER OF ERRORS REPORTED SINCE THE DIAGNOSTIC WAS STARTED. THE 'EOP' SWITCH CAN BE USED TO CONTROL HOW OFTEN THE END OF PASS MESSAGE IS PRINTED. SECTION 2.2 DESCRIBES SWITCHES.

#### 5.0 DEVICE INFORMATION TABLES

THE HARDWARE TABLE CREATED AT STARTUP CONTAINS FIVE WORD ENTRIES FOR EACH DEVICE UNDER TEST. THESE ARE AS FOLLOWS:-

1. LUT CSR ADDRESS
2. LUT INTERRUPT VECTOR
3. INTERRUPT PRIORITY
4. VS11 FIRST BUS ADDRESS
5. VS11 INTERRUPT VECTOR

AT THE BEGINNING OF EACH PASS, THE RELEVANT ADDRESSES FOR THE DEVICE UNDER TEST ARE SET UP IN THE 'GLOBAL DATA' SECTION OF THE PROGRAM

#### 6.0 TEST SUMMARIES

THE PROGRAM CONSISTS OF FOUR TESTS WITH THE FOURTH TEST BEING A STAND ALONE 'COLOR BAR / CROSS HATCH / DOTS' GENERATOR PROGRAM. TEST 4 CAN ONLY BE ENTERED AS FOLLOWS:-  
DR> STA/TEST:4 <CR> OR RES/TEST:4 <CR>  
TO RUN THE NON-INTERVENTION TESTS (TEST 1, TEST 2 AND TEST 3) TYPE STA <CR> AFTER THE DR> PROMPT.

#### 6.1 TEST DESCRIPTION

##### TEST 1. LOOK-UP TABLE LOGIC TEST

THIS TEST IS DEVIDED INTO SUBTESTS AND TESTS THE FOLLOWING FUNCTIONS:-

- INTERRUPT ON READ
- INTERRUPT ON WRITE
- UNEXPECTED READ INTERRUPT
- UNEXPECTED WRITE INTERRUPT

THE ABOVE TESTS ARE REPEATED 40 TIMES.

SUBTEST 1.1      LUT AUTO-INCREMENTS CORRECTLY ON READ  
                  LUT AUTO-INCREMENTS CORRECTLY ON WRITE

SUBTEST 1.2      CLEAR SET FUNCTION WORKS CORRECTLY

SUBTEST 1.3      LUT MEMORY CAN BE WRITTEN AND READ BACK CORRECTLY

##### TEST 2. MAINTENANCE REGISTER READ/WRITE TEST

TEST 3. ANALOG VERIFICATION.

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THIS TEST CHECKS THE RED, GREEN, BLUE AND COMPOSITE VIDEO D.A.C. OUTPUTS AGAINST SET VALUES USING THE MAINTENANCE REGISTER. EACH D.A.C. IS CHECKED TWICE. ONCE WITH GAMMA CORRECTION ENABLED AND ONCE WITH GAMMA CORRECTION OFF. IF 'TOLERANCE' TESTING IS SELECTED, THE THRESHOLD CROSS-OVER POINTS ARE CHECKED AGAINST THE EXPECTED CROSS-OVER POINTS. IF 'GO-NOGO' TESTING IS SELECTED, CHECKS ARE ONLY MADE TO SEE IF ALL FOUR THRESHOLDS ARE EXCEEDED.

TESTS 1 2 AND 3 CAN BE RUN WITHOUT ANY VIDEO MONITOR AS TESTING IS DONE VIA THE MAINTENANCE REGISTER.

TEST 4. BAR-DOT GENERATOR (STAND ALONE)

THIS TEST IS ONLY ENTERED WITH THE COMMANDS  
STA/TEST:4 <CR> OR RES/TEST:4 <CR>

ONCE ENTERED, THE ONLY EXIT IS BY <^C>

THE FOLLOWING KEYBOARD INPUTS CAN BE USED TO CHANGE THE DISPLAY:-

A <CR> = ALTERNATE  
B <CR> = BARS  
C <CR> = 7 X 7 CROSS-HATCH  
D <CR> = 7 X 7 DOT ARRAY  
E <CR> = ENABLE GAMMA CORRECTION  
G <CR> = GAMMA CORRECTION OFF

THE TEST IS INITIATED WITH AN 8 COLOR BAR DISPLAY. BY REPEATEDLY HITTING THE A <CR> KEYS THE DISPLAY CAN BE MADE TO CYCLE ROUND THE FOLLOWING TEST PATTERNS:-

16 COLOR BAR RAINBOW  
64 COLOR BARS  
256 GREYSCALE (FOR BLACK AND WHITE MONITOR)  
16 SHADES OF COLOR 1  
THROUGH  
16 SHADES OF COLOR 7

IF THE 'C' OR 'D' KEY IS HIT AND THEN 'ALTERNATED' THE CROSS-HATCH OR DOTS WILL CHANGE THROUGH THE COLORS RED, GREEN, BLUE, WHITE.

GAMMA CORRECTION COMPENSATES FOR THE NON-LINEARITY OF CRT PHOSPHORES BY INCREASING THE AMPLITUDE OF LOW INTENSITY COLORS.

&  
.ENDR

.NLIST TOC,ME,CND,MEB

ONEFILE=1

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535	.TITLE CZVSVAO COLOUR LOOKUP OPTION
536	.SBTTL
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538	.SBTTL                    TABLE OF CONTENTS
539	.SBTTL
540	.SBTTL

CZVSVAO COLOUR LOOKUP OPTION MACRO M1200 28-APR-83 14:05 PAGE 8  
PROGRAM HEADER

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542      .SBTTL PROGRAM HEADER
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544      :XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
545      .MCALL SVC
546 000000      SVC ; INITIALIZE SUPERVISOR MACROS
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548      SVCGBL= 1 ; DON'T LIST GLOBAL TAGS AT RIGHT MARGIN.
549      SVCTST= 1 ; DITTO TEST TAGS.
550      SVCSUB= 1 ; DITTO SUBTEST TAGS.
551      SVCTAG= 1 ; DITTO ANY OTHER TAGS.
552      SVCINS= 1 ; DITTO INSTRUCTIONS AND DATA.
553
554      : THESE SYMBOLS CONTROL THE LISTING FIELD OF ALL SVC MACRO
555      : EXPANSIONS. YOU MAY CHANGE THEM AT ANY TIME OR PLACE.
556
557      : 1 = RIGHT-JUSTIFY (MAKES IT EASY TO DISTINGUISH
558      : SVC'S MACRO CODE FROM YOUR OWN).
559      : 0 = LEFT-JUSTIFY (ALIGN IN A NORMAL FASHION).
560      : -1 = DON'T LIST THE EXPANSIONS AT ALL.
561      :XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
562
563 000000      .ENABL ABS,AMA
564      .= 2000
565
566      :++
567      : THE PROGRAM HEADER IS THE INTERFACE BETWEEN
568      : THE DIAGNOSTIC PROGRAM AND THE SUPERVISOR.
569      :--
570      SVCGBL= 0 ; ALIGN THE HEADER STUFF.
571      SVCINS= 0
572
573 002000      POINTER BGNSW,BGNSFT ,GNDU,BGNAU,ERRTBL
574 002000      HEADER CZVSV,A,0,20,0,PRI07
002000      L$NAME:: ;DIAGNOSTIC NAME
002000      .ASCII /C/
002001      .ASCII /Z/
002002      .ASCII /V/
002003      .ASCII /S/
002004      .ASCII /V/
002005      .BYTE 0
002006      .BYTE 0
002007      .BYTE 0
002010      L$REV:: ;REVISION LEVEL
002010      .ASCII /A/
002011      L$DEPO:: ;0
002011      .ASCII /0/
002012      L$UNIT:: ;NUMBER OF UNITS
002012      .WORD 0
002014      L$TIML:: ;LONGEST TEST TIME
002014      .WORD 20
002016      L$HPCP:: ;POINTER TO H.W. QUES.
002016      .WORD L$HARD
002020      L$SPCP:: ;POINTER TO S.W. QUES.
002020      .WORD L$SOFT
002022      L$HPTP:: ;PTR. TO DEF. H.W. PTABLE
002022      .WORD L$HW
002024      L$SPTP:: ;PTR. TO S.W. PTABLE

```

CZVSVAO COLOUR LOOKUP OPTION  
PROGRAM HEADER

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002024	002516	L\$LADP::	.WORD	L\$SW	;DIAG. END ADDRESS
002026		L\$STA::	.WORD	L\$LAST	;RESERVED FOR APT STATS
002026	015004	L\$CO::	.WORD	0	
002030	000000	L\$DTYP::	.WORD	0	;DIAGNOSTIC TYPE
002032		L\$APT::	.WORD	0	;APT EXPANSION
002032	000000	L\$DTP::	.WORD	0	;PTR. TO DISPATCH TABLE
002034		L\$DISPATCH			
002034	000000	L\$PRIO::	.WORD		;DIAGNOSTIC RUN PRIORITY
002036		L\$ENVI::	.WORD	PRI07	;FLAGS DESCRIBE HOW IT WAS SETUP
002036	000000	L\$EXP1::	.WORD	0	;EXPANSION WORD
002040		L\$MREV::	.WORD	0	;SVC REV AND EDIT #
002040	013016	L\$REVISION	.BYTE	C\$REVISION	
002042		L\$EDIT	.BYTE	C\$EDIT	
002042	000340	L\$EF::			;DIAG. EVENT FLAGS
002044			.WORD	0	
002044	000000		.WORD	0	
002046		L\$SPC::	.WORD	0	
002046	000000	L\$DEVP::	.WORD	0	; POINTER TO DEVICE TYPE LIST
002050	003	L\$REPP::	.WORD	L\$DVTYP	;PTR. TO REPORT CODE
002050	003	L\$EXP4::	.WORD	0	
002052		L\$EXP5::	.WORD	0	
002052	000000	L\$AUT::	.WORD	0	;PTR. TO ADD UNIT CODE
002054	000000	L\$DUT::	.WORD	L\$AU	;PTR. TO DROP UNIT CODE
002056		L\$LUN::	.WORD	L\$DU	;LUN FOR EXERCISERS TO FILL
002056	000000	L\$DESP::	.WORD	0	;POINTER TO DIAG. DESCRIPTION
002060		L\$LOAD::	.WORD	L\$DESC	;GENERATE SPECIAL AUTOLOAD EMT
002060	002156	L\$SETP::	EMT	E\$LOAD	;POINTER TO ERRTBL
002062		L\$ICP::	.WORD	L\$ERRTBL	;PTR. TO INIT CODE
002062	000000	L\$CCP::	.WORD	L\$INIT	;PTR. TO CLEAN-UP CODE
002064		L\$ACP::	.WORD	L\$CLEAN	;PTR. TO AUTO CODE
002064	000000	L\$PRT::	.WORD	L\$AUTO	;PTR. TO PROTECT TABLE
002066		L\$TEST::	.WORD	L\$PROT	;TEST NUMBER
002066	000000		.WORD	0	
002070					
002070	006422				
002072					
002072	006326				
002074					
002074	000000				
002076					
002076	002122				
002100					
002100	104035				
002102					
002102	003222				
002104					
002104	005652				
002106					
002106	006504				
002110					
002110	006324				
002112					
002112	006316				
002114					
002114	000000				

CZVSVAO COLOUR LOOKUP OPTION MACRO M1200 28-APR-83 14:05 PAGE 8-2  
PROGRAM HEADER

002116			
002116	000000		
002120			
002120	000000		
575 002122			
002122			
002122	052	052	052
002125	052	040	126
002130	123	050	126
002133	051	061	061
002136	055	114	125
002141	040	124	105
002144	123	124	123
002147	040	052	052
002152	052	052	000

```

LSDLY::          ;DELAY COUNT
                .WORD 0
L$HIME::         ;PTR. TO HIGH MEM
                .WORD 0
                DESCRIPT <**** VS(V)11-LU TESTS ****>
L$DESC::         .ASCIZ /**** VS(V)11-LU TESTS ****/

```

576 002156			
002156			
002156	126	123	050
002161	126	051	061
002164	061	040	127
002167	111	124	110
002172	040	114	117
002175	117	113	055
002200	125	120	055
002203	124	101	102
002206	114	105	040
002211	117	120	124
002214	111	117	116
002217	000		

```

                .EVEN
                DEVTYP <VS(V)11 WITH LOOK-UP-TABLE OPTION>
L$DVTYP::       .ASCIZ /VS(V)11 WITH LOOK-UP-TABLE OPTION/

```

577			
578	177777		
579	177777		
580	177777		
581	177777		
582	177777		

.EVEN

```

SVCGBL= -1      ; DON'T LIST GLOBAL TAGS AT RIGHT MARGIN.
SVCTST= -1     ; DITTO TEST TAGS.
SVCSUB= -1     ; DITTO SUBTEST TAGS.
SVCTAG= -1     ; DITTO ANY OTHER TAGS.
SVCINS= -1     ; DITTO INSTRUCTIONS AND DATA.

```

CZVSVA0 COLOUR LOOKUP OPTION  
DEFAULT HARDWARE P-TABLE

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584  
585  
586  
587  
588  
589  
590  
591 002220  
592  
593 002222 172020  
594 002224 000340  
595 002226 000200  
596 002230 172010  
597 002232 000320  
598 002234

.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.  
:--

BGNHW DFPTBL ;DEFAULT HARD-P-TABLE  
.WORD 172020 ; LUT CSR ADDRESS.  
.WORD 340 ; INTERRUPT VECTOR...  
.WORD PRI04 ; ...AND PRIORITY.  
.WORD 172010 ; VS11 FIRST BUS ADDRESS  
.WORD 320 ; FIRST INTERRUPT VECTOR  
ENDHW

CZVSVAO COLOUR LOOKUP OPTION MACRO M1200 28-APR-83 14:05 PAGE 10  
 HARDWARE PARAMETER CODING SECTION

```

600          .SBTTL  HARDWARE PARAMETER CODING SECTION
601
602          :++
603          : THE HARDWARE PARAMETER CODING SECTION CONTAINS MACROS
604          : THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES.  THE
605          : MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
606          : INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES.  THE
607          : MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
608          : WITH THE OPERATOR.
609          :--
610 002234          BGNHRD
611
612 002236          GPRMA  M1,0,0,160000,177776,YES ; GET CSR ADDRESS.
613 002246          GPRMA  M2,2,0,0,776,YES       ; GET VECTOR ADDRESS.
614 002256          GPRMD  M3,4,0,340,0,7,YES     ; GET PRIORITY.
615 002270          GPRMA  M4,6,0,160000,177776,YES ; GET VS11 1ST BUS ADDRESS
616 002300          GPRMA  M5,10,0,0,776,YES     ; GET VS11 INTERRUPT VECTOR ADD
617 002310          EXIT HRD
618 002312          M1:   .ASCIZ  /VS(V)11-LU CSR ADDRESS..../
        002315          126    123    050
        002320          126    051    061
        002323          061    055    114
        002326          125    040    103
        002331          123    122    040
        002334          101    104    104
        002337          122    105    123
        002342          123    056    056
        002345          056    056    000
619 002345          M2:   .ASCIZ  /VS(V)11-LU INTERRUPT VECTOR/
        002350          126    123    050
        002353          126    051    061
        002356          061    055    114
        002361          125    010    111
        002364          116    124    105
        002367          122    122    125
        002372          120    124    040
        002375          126    105    103
        002400          124    117    122
        002401          000
620 002401          M3:   .ASCIZ  /INTERRUPT PRIORIPITY../
        002404          111    116    124
        002407          105    122    122
        002412          125    120    124
        002415          040    120    122
        002420          111    117    122
        002423          111    124    131
        002426          056    056    000
621 002426          M4:   .ASCIZ  /VS(V)11 1ST BUS ADDRESS.../
        002431          126    123    050
        002434          126    051    061
        002437          061    040    061
        002442          123    124    040
        002445          102    125    123
        002450          040    101    104
        002453          104    122    105
        002456          123    123    056
622 002456          M5:   .ASCII  /VS(V)11 INTERRUPT VECTOR../
        002461          056    056    000
        002464          126    123    050
        002467          126    051    061
        002472          061    040    111
        002472          116    124    105

```

CZVSVAO COLOUR LOOKUP OPTION MACRO M1200 28-APR-83 14:05 PAGE 10-1  
HARDWARE PARAMETER CODING SECTION

002475	122	122	125
002500	120	124	040
002503	126	105	103
002506	124	117	122
002511	056	056	
623			
624 002514			

.EVEN  
ENDHRD

CZVSVAO COLOUR LOOKUP OPTION MACRO M1200 28-APR-83 14:05 PAGE 11  
SOFTWARE P-TABLE

626				
627				
628				
629				
630				
631				
632	00254			
633	002516	000001		
634				
635	002520			
636				
637				
638				
639				
640				
641				
642				
643				
644				
645				
646				
647	002520			
648	002522			
649	002530			
650	002532	124	117	114
	002535	105	122	101
	002540	116	103	105
	002543	040	124	105
	002546	123	124	111
	002551	116	107	040
	002554	122	105	121
	002557	125	111	122
	002562	105	104	077
	002565	077		
651	002566	015		
652	002567	012		
653	002570	116	123	
	002573	105	122	
	002576	040	131	050
	002601	105	123	051
	002604	040	106	117
	002607	122	040	124
	002612	117	114	105
	002615	122	101	116
	002620	103	105	040
	002623	116	050	117
	002626	051	040	106
	002631	117	122	040
	002634	107	117	055
	002637	116	117	107
	002642	117	040	124
	002645	105	123	124
	002650	000		
654				
655	002652			

.SBTTL SOFTWARE P-TABLE

;++  
: THE SOFTWARE P-TABLE CONTAINS THE VALUES OF THE PROGRAM  
: PARAMETERS THAT CAN BE CHANGED BY THE OPERATOR.

!--  
TOL: BGNSW SFPTBL ; 0 FOR GO-NOGO TESTING  
.WORD 1 ; 1 FOR TOLERANCE TESTING  
ENDSW

.SBTTL SOFTWARE PARAMETER CODING SECTION

;++  
: 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.

!--  
GPRML BGNSFT ; ASK IF TOLERANCE TESTING REQUIRED  
SM1,0,-1,YES  
EXIT SFT  
SM1: .ASCII /TOLERANCE TESTING REQUIRED??/

.BYTE 15  
.BYTE 12 ; CR/LF  
.ASCIZ /ANSWER Y(ES) FOR TOLERANCE N(O) FOR GO-NOGO TEST/

.EVEN  
ENDSFT

CZVSVAO COLOUR LOOKUP OPTION  
GLOBAL EQUATES SECTION

MACRO M1200 28-APR-83 14:05 PAGE 12

656  
657  
658  
659  
660  
661  
662  
663 002652

.SBTTL GLOBAL EQUATES SECTION

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

EQUALS ; GET STANDARD EQUATES.

: BIT DEFINITIONS

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.	: START COMMAND WAS ISSUED
000037	EF.RESTART== 31.	: RESTART COMMAND WAS ISSUED
000036	EF.CONTINUE== 30.	: CONTINUE COMMAND WAS ISSUED
000035	EF.NEW== 29.	: A NEW PASS HAS BEEN STARTED
000034	EF.PWR== 28.	: A POWER-FAIL/POWER-UP OCCURRED

: PRIORITY LEVEL DEFINITIONS

000340	PRI07== 340
000300	PRI06== 300
000240	PRI05== 240
000200	PRI04== 200
000140	PRI03== 140
000100	PRI02== 100

CZVSVAO COLOUR LOOKUP OPTION  
GLOBAL EQUATES SECTION

MACRO M1200 28-APR-83 14:05 PAGE 12-1

000040  
000000

PRI01== 40  
PRI00== 0

.; OPERATOR FLAG BITS

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

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

664

CZVSAO COLOUR LOOKUP OPTION MACRO M1200 28-APR-83 14:05 PAGE 13  
 \*\*\* VSV-11 INSTRUCTION EQUATES.

```

666      .SBTTL *** VSV-11 INSTRUCTION EQUATES.
667      ;
668      ;PLOTTING INSTRUCTIONS.
669      ;
670      100000 CHAR== 100000 ; CHARACTER MODE.
671      104000 SVEC== 104000 ; SHORT VECTOR MODE.
672      110000 LVEC== 110000 ; LONG VECTOR MODE.
673      114000 APNT== 114000 ; ABSOLUTE POINT MODE.
674      120000 GHX== 120000 ; GRAPH/HISTOGRAM X MODE.
675      124000 GHY== 124000 ; GRAPH/HISTOGRAM Y MODE.
676      130000 RPNT== 130000 ; RELATIVE POINT MODE.
677      ;
678      ;PIXEL DATA FIELD <10:2> FOR THE ABOVE OPCODES.
679      ;
680      002000 L0== BIT10 ; LEVEL 0 (BLACK) IS JUST THE ENABLE.
681      002377 L255== L0!<377> ; LEVEL 255 IS THE MAX POSSIBLE.
682      002377 ALL== L255
683      ;
684      ; COLOR LOOK-UP-RAM DEFINITIONS.
685      ;
686      010000 LREAD== BIT12 ; CSR -- READ DATA FROM ADDR <7:0>.
687      002000 LDI== BIT10 ; INTERRUPT ON READ/WRITE DONE.
688      ;
689      010000 LSET== BIT12 ; DATA REG -- SET ALL ADDRESSES TO...
690      ;...DATA PATTERN IN <11:0>...
691      ;...BLU<11:8>, GRN<7:4>, RED<3:0>.
692      ;
693      000100 GCOFF== BIT6 ; MAINT REG -- GAMMA CORRECT OFF.
694      000040 CVC== BIT5 ; COMP VIDEO > MDAC (READ-ONLY).
695      000020 REDC== BIT4 ; RED DAC > MDAC (READ-ONLY).
696      000010 GRNC== BIT3 ; GRN DAC > MDAC (READ-ONLY).
697      000004 BLUC== BIT2 ; BLU DAC > MDAC (READ-ONLY).
698      000000 MDV0== 0 ; SET MAINT DAC TO 0.0 V.
699      000001 MDV1== 1 ; 0.5 V.
700      000002 MDV2== 2 ; 1.0 V.
701      000003 MDV3== 3 ; 1.35 V.
702      ;
703      ; BIT MAP MODE DEFINITIONS.
704      ;
705      136000 BM14== 136000 ; MODE 1 WITH 4 BIT PIXELS.
706      137000 BM18== 137000 ; MODE 1 WITH 8 BIT PIXELS.
707      ; PIXEL COUNT IN <8:0>.
708      ;
709      134000 BM04== 134000 ; MODE 0 WITH 4 BIT PIXELS.
710      135000 BM08== 135000 ; MODE 0 WITH 8 BIT PIXELS.
711      000000 M32== 0 ; 32 SQUARE PIXEL ARRAY.
712      000001 M64== 1 ; 64 SQUARE.
713      000002 M128== 2 ; 128 SQUARE.
714      000003 M256== 3 ; 256 SQUARE.
715      000010 EX2== 10 ; EXPAND BY 2, NO SMOOTHING.
716      000020 EX4== 20 ; EXPAND BY 4, NO SMOOTHING.
717      000050 EXSM2== 50 ; EXPAND AND SMOOTH BY 2.
718      000060 EXSM4== 60 ; EXPAND AND SMOOTH BY 4.
719      000100 R256== 100 ; 256 X 256 RESOLUTION.

```

CZVSAO COLOUR LOOKUP OPTION MACRO M1200 28-APR-83 14:05 PAGE 14  
 \*\*\* VSV-11 INSTRUCTION EQUATES.

```

721          ;CONTROL AND STATUS INSTRUCTIONS.
722          ;
723          146040 CUOFF== 146040          ;CURSOR (JOY-STICK) VIDEO OFF.
724          146060 CUON== 146060          ;CURSOR VIDEO ON.
725          146100 CURD== 146100          ;READ JSX,JSY => DXR,DYR.
726          146016 CUIM== 146016          ;INTERRUPT ON MATCH (SWITCH DISABLED).
727          146013 CUIS== 146013          ;INTERRUPT ON SWITCH (MATCH DISABLED).
728          146012 CUIOFF== 146012        ;INTERRUPTS (BOTH) OFF.
729
730          150000 SETHB== 150000          ;SET GRAPH/HISTO BASE LINE.
731          152000 SETCB== 152000          ;SET CHARACTER BASE ADDRESS.
732
733          160000 DJMP== 160000           ;DISPLAY JUMP.
734          164000 DNOP== 164000          ;DISPLAY NO-OP.
735          165000 DPOP== 165000          ;DPOP = RTS FROM CHARACTER SUB-PIX.
736          164001 SYNC== DNOP+1          ;PROCEED IN SYNC = DNOP + N <8:0>.
737          ;WAITS FOR N OCCURRENCES OF VERTICAL...
738          ;...SYNC START, THEN PROCEEDS...
739          ;...(16.6MS @ 60HZ OR 20MS @ 50HZ).
740
741          170200 SWTCH== 170200          ;SWITCH READ/WRITE STATUS.
742          170140 CLRMEM== 170140         ;CLEAR IMAGE MEMORY TO 0'S.
743          170100 SETMEM== 170100        ;SET IMAGE MEMORY TO CURRENT PIX DATA.
744
745          172000 STOP== 172000           ;DISPLAY STOP.
746          171000 SIOFF== 171000         ;STOP INTERRUPT DISABLE.
747          171400 SION== 171400          ;STOP INTERRUPT ENABLE.
748          173000 STOPN== STOP!SIOFF     ;STOP, DO NOT INTERRUPT.
749          173400 STOPI== STOP!SION      ;STOP AND INTERRUPT.
750
751          174100 GXI== 174100            ;SET X INCREMENT <5:0> FOR GRAPH/HST Y.
752          174100 GYI== GXI              ;SET Y INCREMENT <5:0> FOR GRAPH/HST X.
753
754          000001 HCPY== BIT0             ;ENABLE HARD-COPY.
755          000010 SWE== BIT3             ;ENABLE SWITCH RD/WRT.
756          176000 PROTEC== 176000        ;PROTECT MEMORY (OFF).
757          176050 READ== 176040!SWE      ;READ MEM (DISPLAY), SWITCH ENABLED.
758          176034 WRT== 176024!SWE      ;WRITE MEM (1'S AND 0'S), SWITCH ENABLED.
759          176036 WRT1== 176026!SWE     ;WRITE MEM (1'S ONLY), SWITCH ENABLED.
760          176074 RDWRT== READ!WRT       ;READ, WRITE ALL DURING RETRACE.
761          176076 RDWRT1== READ!WRT1    ;READ, WRITE 1'S DURING RETRACE.
762          176051 HCOPY== READ!HCPY      ;READ MEM => HARD COPY DEVICE.
763
764          000000 CH0== 0                  ;CHANNEL SELECT BITS...
765          000400 CH1== BIT8             ;...FOR MEMORY CONTROL...
766          001000 CH2== BIT9             ;...INSTRUCTIONS (176XXX).
767          001400 CH3== BIT8!BIT9
768
769          000000 JS0== CH0                ;JOY-STICK UNIT SELECT BITS...
770          000400 JS1== CH1                ;...FOR CURSOR CONTROL...
771          001000 JS2== CH2                ;...INSTRUCTIONS (146XXX).
772          001400 JS3== CH3

```

CZVSVAO COLOUR LOOKUP OPTION    MACRO M1200    28-APR-83 14:05    PAGE 15  
 \*\*\* VSV-11 INSTRUCTION EQUATES.

```

774      ;OTHER USEFUL DEFINITIONS.
775      .
776      040000      I==      BIT14      ;INTENSIFY VECTOR OR POINT.
777      020000      MSX==     BIT13      ;MINUS SIGNS FOR...
778      000100      MSY==     BIT6       ;...SHORT FORM VECTOR DATA.
779      020000      MXY==     BIT13     ;MINUS SIGN FOR LONG FORM DATA.
780      040000      HST==     BIT14     ;USE GHX/GHY DATA AS HISTOGRAM.
781
782      001776      MAXX==    511.*2     ;MAXIMUM X ADDRESS (512 X 512 X 2).
783      001776      MAXY==    MAXX      ;SAME FOR Y.
784      000776      HAFX==    <MAXX/2>-1 ;HALF MAX X (CENTER SCREEN).
785      000776      HAFY==    HAFX     ;SAME FOR Y.
786
787      001776      MAXY50==  511.*2     ;MAX VISIBLE Y ON 50HZ SYSTEM.
788      000776      HAFY50== <MAXY50/2>-1 ;HALF VISIBLE Y.
789
790      001676      MAXY60== <511.-32.>*2 ;MAX VISIBLE Y ON 60HZ SYSTEM.
791      000736      HAFY60== <MAXY60/2>-1 ;HALF VISIBLE Y.
792
793      000002      DX==      2          ;DELTA X (1 PIXEL UNIT).
794      000002      DYI==    DX        ;DELTA Y, INTERLACED MODE.
795      000004      DYNI==   DX*2      ;DELTA Y, NON-INTERLACED MODE.
796
797      000014      SETRR==   14        ; SET RELOCATE REGISTER WITH <15:4>...
798      ;...DSR<15:4> BECOMES RR<17:6>.

```

CZVSVAO COLOUR LOOKUP OPTION    MACRO M1200 28-APR-83 14:05 PAGE 16  
 \*\*\* SPECIAL MACROS AND OPDEFS.

```

800      .SBTTL *** SPECIAL MACROS AND OPDEFS.
801      :
802      : MACRO TO XCT MEMORY SETUP FUNCTIONS (STAT C INSTRUCTIONS)
803      : VAILD FUNCTION.S ARE:
804      : PROTEC, READ, WRT, WRT1, RDWRT, RDWRT1, HCOPY.
805      :
806      :   .MACRO SETUP FUNC,N1,N2,N3,N4
807      :   .IIF NB <N1>,   FUNC!CH'N1
808      :   .IIF NB <N2>,   FUNC!CH'N2
809      :   .IIF NB <N3>,   FUNC!CH'N3
810      :   .IIF NB <N4>,   FUNC!CH'N4
811      :   .ENDM  SETUP
812      :
813      : MACROS FOR ASSEMBLING VECTOR DATA.
814      : CALLING ARGUMENTS ARE:
815      :   A = INTENSIFY BIT, 'I' OR 'U'
816      :   B = DELTA X, +/-0 THRU 1776 (76 IF SHORT TYPE).
817      :   C = DELTA Y,           DITTO
818      :
819      :   .MACRO SXY A,B,C           ;ASSEMBLE SHORT (1 WORD) DATA.
820      :   .I = 40000
821      :   .DX = B*200
822      :   .DY = C
823      :   .IIF IDN <U> <A>, .I = 0
824      :   .IIF LT B, .DX = <-B*200>!20000
825      :   .IIF LT C, .DY = <-C>!100
826      :   .WORD .I!.DX!.DY
827      :   .ENDM  SXY
828      :
829      :   .MACRO LXY A,B,C           ;ASSEMBLE LONG (2 WORDS) DATA.
830      :   .I = 40000
831      :   .DX = B
832      :   .DY = C
833      :   .IIF IDN <U> <A>, .I = 0
834      :   .IIF LT B, .DX = <-B>!20000
835      :   .IIF LT C, .DY = <-C>!20000
836      :   .WORD .I!.DX, .DY
837      :   .ENDM  LXY
838      :
839      : SOME HANDY -11 OPDEF'S.
840      :
841      :   SKP3= BR+3           ;SKIP NEXT 3 WORDS.
842      :   SKP2= BR+2           ;SKIP NEXT 2 WORDS.
843      :   SKP1= BR+1           ;SKIP NEXT WORD.
844      :   SKP0= BR+0          ;SAME AS A NOP.

```

```

000403
000402
000401
000400

```

CZVSAO COLOUR LOOKUP OPTION    MACRO M1200    28-APR-83 14:05    PAGE 17  
 \*\*\* SPECIAL MACROS AND OPDEFS.

```

846      :
847      : MACRO TO STANDARDIZE THE INITIALIZATION OF EACH TEST.
848      : PROVIDES AN ASCIZ TITLE STRING, AND POINTER FOR
849      : SUBSEQUENT PRINTING (IF REQ'D) VIA 'PRINTF TNAM,TNUM' CALL.
850      : ALSO INITs A SEQUENTIAL ERROR NUMBER SEQUENCE, AND
851      : SETs AN ITERATION COUNT FOR THE CURRENT TEST.
852      :
853      :
854      :   .MACRO BEGIN.TEST TEXT,LK,?TAG1,?TAG2
855      :   BGNTST
856      :   TN=T$TESTNUM           ;TEST NUMBER
857      :   EN=TN*100.             ;INIT ERROR NUMBER SEQUENCE.
858      :   .IF B <LK>, MOV #1,LOOPK ;DEFAULT = 1.
859      :   .IF NB <LK>, MOV #LK,LOOPK
860      :   MOV #TAG1,TNAM          ;...AND NAME POINTER.
861      :   BR TAG2                ;SKIP OVER THE ASCII.
862      TAG1: .ASCIZ  \%A: TEXT\
863      TAG2: .EVEN
864      :   .ENDM BEGIN.TEST
865      :
866      : MACROS TO DEFINE SEQUENTIAL ERROR NUMBERS FOR
867      : SUBSEQUENT SUPERVISOR ERROR CALLS.
868      : REQUIRES PRIOR USE OF 'BEGIN.TEST' MACRO.
869      :
870      :   .MACRO SFERR ADDR,PNTR           ; SYSTEM FATAL.
871      :   EN=EN+1
872      :   ERRSF EN,ADDR,PNTR
873      :   .ENDM SFERR
874      :
875      :   .MACRO DFERR ADDR,PNTR           ; DEVICE FATAL.
876      :   EN=EN+1
877      :   ERRDF EN,ADDR,PNTR
878      :   .ENDM DFERR
879      :
880      :   .MACRO SFTERR ADDR,PNTR          ; SOFT ERROR.
881      :   EN=EN+1
882      :   ERRSOFT EN,ADDR,PNTR
883      :   .ENDM SFTERR
884      :
885      :   .MACRO HRDERR ADDR,PNTR          ; HARD ERROR.
886      :   EN=EN+1
887      :   ERRHRD EN,ADDR,PNTR
888      :   .ENDM HRDERR

```

CZVSVAO COLOUR LOOKUP OPTION  
GLOBAL DATA SECTION

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```

890      .SBTTL  GLOBAL DATA SECTION
891
892      :++
893      : THE GLOBAL DATA SECTION CONTAINS DATA THAT ARE USED
894      : IN MORE THAN ONE TEST.
895      :--
896
897      :
898      : THE FOLLOWING DATA ARE SET FOR EACH UNIT AT INIT TIME.
899      : SINGLE UNIT DEFAULTS (LISTED) ARE IN THE DEFAULT P-TABLE.
900
901      UUT::  0          ;UNIT # UNDER TEST.
902      QVP::  0          ;QUICK VERIFY FLAG.
903
904      DPC::  172010     ;DISPLAY PC
905      DSR::  172012     ;DISPLAY STATUS REGISTER (ALSO REL REG).
906      DXR::  172014     ;DISPLAY X POSITION REGISTER.
907      DYP::  172016     ;DISPLAY Y POSITION REGISTER.
908
909      LSR::  172020     ; LOOK-UP-RAM STATUS.
910      LDR::  172022     ;          DATA.
911      LMR::  172024     ;          AND MAINT REGISTERS.
912
913
914      DPRI::  PRI04     ;INTERRUPT PRIORITY.
915      STPV::  320       ;STOP VECTOR
916      JSMV::  324       ;JOY-STICK MATCH VECTOR.
917      TOTV::  330       ;TIME-OUT VECTOR
918      JSSV::  334       ;JOY-STICK SWITCH (DEMAND) VECTOR.
919      LUTV::  340       ; LUT READ/WRITE DONE VECTOR.
920
921      :
922      : MISCELANEOUS STORAGE REGISTERS.
923
924      IDPC::  0          ;SAVED DPC ON ANY INTERRUPT.
925      IDSR::  0          ;          DITTO DSR
926      IDXR::  0          ;          DITTO DXR
927      IDYR::  0          ;          DITTO DYP
928      ILSR::  0          ;          DITTO LUT CSR
929      ILDR::  0          ;          DITTO LUT DATA
930      ILMR::  0          ;          DITTO LUT MAINT.
931
932      FLAGS:  0          ; START-UP COMMAND FLAGS (SWITCH REGISTER).
933
934      LUTAV::  0          ; NON-ZERO = LUT AVAILABLE.
935      SHADLY::  0        ; SHADING DELAY COUNTER (OPTIONAL).
936      HUE::  NTSC8+2    ; CURRENT COLOR POINTER (OPTIONAL).
937
938      TEMP1::  0          ;SOME TEMP LOCATIONS.
939      TEMP2::  0
940      TEMP3::  0

```

CZVSVAO COLOUR LOOKUP OPTION    MACRO M1200 28-APR-83 14:05 PAGE 19  
GLOBAL TEXT SECTION

941  
942  
943  
944  
945  
946  
947

.SBTTL GLOBAL TEXT SECTION

:++  
: THE GLOBAL TEXT SECTION CONTAINS FORMAT STATEMENTS,  
: MESSAGES, AND ASCII INFORMATION THAT ARE USED IN  
: MORE THAN ONE TEST.  
:--

CZVSVAO COLOUR LOOKUP OPTION  
GLOBAL ERROR REPORT SECTION

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```

949      .SBTTL GLOBAL ERROR REPORT SECTION
950
951      :++
952      : THE GLOBAL ERROR REPORT SECTION CONTAINS THE PRINT CALLS
953      : AND ASCII TEXT FOR ALL ERRORS. SOME ADDITIONAL TEXT
954      : (OPTIONAL EXTENSIONS) MAY BE FOUND WITHIN INDIVIDUAL TESTS.
955      :--
956
957 002744 BGNMSG UTOERR ; DPU TIME-OUT ERROR -- SYSTEM FATAL ERROR.
958 002744 PRINTX #UTOX,R1,@DPC ; R1 = CPU PC
959 002772 004737 003232 JSR PC,EXTEND ; PRINT EXTENSION IF REQUIRED.
960 002776 ENDMMSG
961
962 003000 BGNMSG NXRERR ; NON-EX REGISTER -- DEVICE FATAL ERROR.
963 003000 PRINTX #NXRX,R1 ; R1 = NEXM ADDRESS.
964 003022 004737 003232 JSR PC,EXTEND ; PRINT EXTENSION IF REQUIRED.
965 003026 ENDMMSG
966
967 003030 BGNMSG LINTER ; LUT INTERRUPT ERROR.
968 003030 PRINTX #LINTX,@LSR ; SHOW CSR.
969 003054 004737 003232 JSR PC,EXTEND ; PRINT EXTENSION IF REQUIRED.
970 003060 ENDMMSG
971
972 003062 BGNMSG LRWERR ; LUT READ/WRITE ERROR.
973 003062 PRINTX #LRWX,@LSR,R1,R2 ; CSR, EXP'D, REC'D.
974 003112 004737 003232 JSR PC,EXTEND ; PRINT EXTENSION IF REQUIRED.
975 003116 ENDMMSG
976
977 003120 BGNMSG DACERR ; DAC OUTPUT ERROR.
978 003120 PRINTX DACX
979 003140 PRINTX #DACGC,GCX
980 003164 004737 003232 JSR PC,EXTEND ; PRINT EXTENSION.
981 003170 ENDMMSG
982
983 BGNMSG MRWERR ; MAINTENANCE REG R/W/ ERROR
984 003172 PRINTX #LMER,@LMR,R1,R2
985
986 : DYNAMIC ERROR TABLE USED IN SOME OF THE TESTS.
987 :
988 003222 ERRTBL
989 003222 000000 ERRTP:: .WORD 0
990 003224 000000 ERRNBR:: .WORD 0
991 003226 000000 ERRMSG:: .WORD 0
992 003230 000000 ERRBLK:: .WORD 0
993
994 : THIS ROUTINE APPENDS A UNIQUE EXTENSION (IF REQUIRED)
995 : TO ANY OF THE ABOVE ERROR SIGNATURES.
996
997 EXTEND: TST (PC)+
998 EXTA: 0 ; 0 = NO EXTENSION.
999 BEQ 1$
1000 JSR PC,@EXTA ; APPEND EXTENSION TEXT.
1001 1$: RTS PC

```

: ASCII ERROR MESSAGES (EXTENSIONS MAY BE USED IF REQUIRED).

CZVSVAO COLOUR LOOKUP OPTION  
GLOBAL ERROR REPORT SECTION

MACRO M1200 28-APR-83 14:05 PAGE 20-1

```

1002          ; SYSTEM FATAL ERROR.
1003          ;
1004 003246    040    040    125  UTO:  .ASCIZ / UNEXPECTED DPU "TIME-OUT" INTERRUPT/
      003251    116    105    130
      003254    120    105    103
      003257    124    105    104
      003262    040    104    120
      003265    125    040    042
      003270    124    111    115
      003273    105    055    117
      003276    125    124    042
      003301    040    111    116
      003304    124    105    122
      003307    122    125    120
      003312    124    000
1005 003314    045    101    040  UTOX:  .ASCIZ /%A CPU PC: %06%A DPC: %06/
      003317    040    103    120
      003322    125    040    120
      003325    103    072    040
      003330    045    117    066
      003333    045    101    040
      003336    040    104    120
      003341    103    072    040
      003344    045    117    066
      003347    000
1006          ;
1007          ; DEVICE FATAL ERROR.
1008          ;
1009 003350    040    040    116  NXR:  .ASCIZ / NON-EXISTANT DEVICE REGISTER/
      003353    117    116    055
      003356    105    130    111
      003361    123    124    101
      003364    116    124    040
      003367    104    105    126
      003372    111    103    105
      003375    040    122    105
      003400    107    111    123
      003403    124    105    122
      003406    000
1010 003407    045    101    040  NXRX: .ASCIZ /%A ADDRESS: %06/
      003412    040    101    104
      003415    104    122    105
      003420    123    123    072
      003423    040    045    117
      003426    066    000
1011          ;
1012          ; DEVICE HARD ERRORS.
1013          ;
1014 003430    040    040    114  NLRI: .ASCIZ / LUT READ INTERRUPT EXPECTED, NOT RECEIVED/
      003433    125    124    040
      003436    122    105    101
      003441    104    040    111
      003444    116    124    105
      003447    122    122    125
      003452    120    124    040
      003455    105    130    120
      003460    105    103    124

```

CZVSVAO COLOUR LOOKUP OPTION  
GLOBAL ERROR REPORT SECTION

MACRO M1200 28-APR-83 14:05 PAGE 20-2

	003463	105	104	054	
	003466	040	116	117	
	003471	124	040	122	
	003474	105	103	105	
	003477	111	126	105	
	003502	104	000		
1015	003504	040	040	114	NLWI: .ASCIZ / LUT WRITE INTERRUPT EXPECTED, NOT RECEIVED/
	003507	125	124	040	
	003512	127	122	111	
	003515	124	105	040	
	003520	111	116	124	
	003523	105	122	122	
	003526	125	120	124	
	003531	040	105	130	
	003534	120	105	103	
	003537	124	105	104	
	003542	054	040	116	
	003545	117	124	040	
	003550	122	105	103	
	003553	105	111	126	
	003556	105	104	000	
1016	003561	040	040	125	ULRI: .ASCIZ / UNEXPECTED LUT READ INTERRUPT/
	003564	116	105	130	
	003567	120	105	103	
	003572	124	105	104	
	003575	040	114	125	
	003600	124	040	122	
	003603	105	101	104	
	003606	040	111	116	
	003611	124	105	122	
	003614	122	125	120	
	003617	124	000		
1017	003621	040	040	125	ULWI: .ASCIZ / UNEXPECTED LUT WRITE INTERRUPT/
	003624	116	105	130	
	003627	120	105	103	
	003632	124	105	104	
	003635	040	114	125	
	003640	124	040	127	
	003643	122	111	124	
	003646	105	040	111	
	003651	116	124	105	
	003654	122	122	125	
	003657	120	124	000	
1018	003662	045	101	040	LINTX: .ASCIZ /%A CSR: %06/
	003665	040	103	123	
	003670	122	072	040	
	003673	045	117	066	
	003676	000			
1019	003677	040	040	114	LAIER: .ASCIZ / LUT AUTO-INCR INCORRECT ON READ/
	003702	125	124	040	
	003705	101	125	124	
	003710	117	055	111	
	003713	116	103	122	
	003716	040	111	116	
	003721	103	117	122	
	003724	122	105	103	
	003727	124	040	117	

CZVSVAD COLOUR LOOKUP OPTION  
GLOBAL ERROR REPORT SECTION

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	003732	116	040	122	
	003735	105	101	104	
	003740	000			
1020	003741	040	040	114	LAIEW: .ASCIZ / LUT AUTO-INCR INCORRECT ON WRITE/
	003744	125	124	040	
	003747	101	125	124	
	003752	117	055	111	
	003755	116	103	122	
	003760	040	111	116	
	003763	103	117	122	
	003766	122	105	103	
	003771	124	040	117	
	003774	116	040	127	
	003777	122	111	124	
	004002	105	000		
1021	004004	040	040	114	LDINC: .ASCIZ / LUT DATA INCORRECT/
	004007	125	124	040	
	004012	104	101	124	
	004015	101	040	111	
	004020	116	103	117	
	004023	122	122	105	
	004026	103	124	000	
1022	004031	045	101	040	LRWX: .ASCIZ /%A CSR: %06%A EXP'D: %06%A REC'D: %06/
	004034	040	103	123	
	004037	122	072	040	
	004042	045	117	066	
	004045	045	101	040	
	004050	040	105	130	
	004053	120	047	104	
	004056	072	040	045	
	004061	117	066	045	
	004064	101	040	040	
	004067	122	105	103	
	004072	047	104	072	
	004075	040	045	117	
	004100	066	000		
1023	004102	040	114	125	MAIER: .ASCIZ / LUT MAINTENANCE REG READ WRITE ERROR /
	004105	124	040	115	
	004110	101	111	116	
	004113	124	105	116	
	004116	101	116	103	
	004121	105	040	122	
	004124	105	107	040	
	004127	122	105	101	
	004132	104	040	127	
	004135	122	111	124	
	004140	105	040	105	
	004143	122	122	117	
	004146	122	040	000	
1024	004151	045	101	040	LMER: .ASCIZ /%A MAINT REG: %06%A EXP'D: %06%A REC'D: %06/
	004154	115	101	111	
	004157	116	124	040	
	004162	122	105	107	
	004165	072	040	045	
	004170	117	066	045	
	004173	101	040	040	
	004176	105	130	120	

CZVSVAD COLOUR LOOKUP OPTION  
GLOBAL ERROR REPORT SECTION

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	004201	047	104	072	
	004204	040	045	117	
	004207	066	045	101	
	004212	040	040	122	
	004215	105	103	047	
	004220	104	072	040	
	004223	045	117	066	
	004226	000			
1025	004227	040	040	122	RDERR: .ASCIZ / RED DAC ERROR/
	004232	105	104	040	
	004235	104	101	103	
	004240	040	105	122	
	004243	122	117	122	
	004246	000			
1026	004247	040	040	107	GDERR: .ASCIZ / GREEN DAC ERROR/
	004252	122	105	105	
	004255	116	040	104	
	004260	101	103	040	
	004263	105	122	122	
	004266	117	122	000	
1027	004271	040	040	102	BDERR: .ASCIZ / BLUE DAC ERROR/
	004274	114	125	105	
	004277	040	104	101	
	004302	103	040	105	
	004305	122	122	117	
	004310	122	000		
1028	004312	040	040	103	CDERR: .ASCIZ / COMPOSITE DAC ERROR/
	004315	117	115	120	
	004320	117	123	111	
	004323	124	105	040	
	004326	104	101	103	
	004331	040	105	122	
	004334	122	117	122	
	004337	000			
1029	004340	045	101	040	DACX1: .ASCIZ /%A INPUT REQUIRED TO EXCEED THRESHOLD INCORRECT/
	004343	040	111	116	
	004346	120	125	124	
	004351	040	122	105	
	004354	121	125	111	
	004357	122	105	104	
	004362	040	124	117	
	004365	040	105	130	
	004370	103	105	105	
	004373	104	040	124	
	004376	110	122	105	
	004401	123	110	117	
	004404	114	104	040	
	004407	111	116	103	
	004412	117	122	122	
	004415	105	103	124	
	004420	000			
1030	004421	045	101	040	DACX2: .ASCIZ /%A FAILED TO CROSS ALL MAINTENANCE THRESHOLDS/
	004424	040	106	101	
	004427	111	114	105	
	004432	104	040	124	
	004435	117	040	103	
	004440	122	117	123	

CZVSVAO COLOUR LOOKUP OPTION  
GLOBAL ERROR REPORT SECTION

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	004443	123	040	101	
	004446	114	114	040	
	004451	115	101	111	
	004454	116	124	105	
	004457	116	101	116	
	004462	103	105	040	
	004465	124	110	122	
	004470	105	123	110	
	004473	117	114	104	
	004476	123	000		
1031	004500	045	116	045	DACGC: .ASCIZ /%N% GAMMA CORRECTION IS -- %T/
	004503	101	040	040	
	004506	107	101	115	
	004511	115	101	040	
	004514	103	117	122	
	004517	122	105	103	
	004522	124	111	117	
	004525	116	040	111	
	004530	123	040	055	
	004533	055	040	045	
	004536	124	000		
1032	004540	040	117	116	GON: .ASCIZ / ON /
	004543	040	000		
1033	004545	040	117	106	GOFF: .ASCIZ / OFF/
	004550	106	000		
1034					.EVEN
1035	004552	004421			JACX: DACX2 ; OR DACX1
1036	004554	004540			GCX: GON ; OR GOFF

CZVSVAD COLOUR JOKUP OPTION  
GLOBAL SUBROUTINES SECTION

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```

1038      .SBTTL  GLOBAL SUBROUTINES SECTION
1039
1040      :++
1041      : THE GLOBAL SUBROUTINES SECTION CONTAINS THE SUBROUTINES
1042      : THAT ARE USED IN MORE THAN ONE TEST.
1043      :--
1044
1045      :
1046      : DEFAULT DISPLAY INTERRUPT HANDLERS.
1047      : IF DISPLAY TIME-OUT, REPORT SYSTEM FATAL, AND ABORT PASS.
1048      : OTHERWISE, SAVE DPU REGISTERS AND DISMISS.
1049
1050      DTO:  MOV      (SP),R1      ;DISPLAY TIME-OUT, GET CPU PC...
1051      MOV      #1$, (SP)      ;...FIX STACK TO RETURN HERE...
1052      BR       DPUSAV        ;...AFTER THE "SAVE".
1053      1$:    CLR      EXTA      ; CLEAR EXTENSION FLAG.
1054      ERRSF   0,UTO,UTOERR    ;REPORT ERROR...
1055      DOCLN                      ;...AND ABORT PASS.
1056
1057      DSTP:  JMP      @(PC)+
1058      DPUSAV
1059      DJM:   JMP      @(PC)+
1060      DPUSAV
1061      DJS:   JMP      @(PC)+
1062      DPUSAV
1063
1064      DPUSAV: MOV      @DPC, IDPC ;SAVE DISPLAY PC...
1065      MOV      @DSR, IDSR      ;...STATUS...
1066      MOV      @DXR, IDXR     ;...X POSITION...
1067      MOV      @DYR, IDYR     ;...Y POSITION...
1068      RTI                          ;...AND DISMISS.
1069
1070      :
1071      : AND A SIMILAR ONE FOR THE LUT INTERRUPTS.
1072      LDUN:  JMP      @(PC)+
1073      LUTSAV
1074      LUTSAV: MOV      @LSR, ILSR ; SAVE LUT REGISTERS.
1075      MOV      @LDR, ILDR
1076      MOV      @LMR, ILMR
1077      RTI                          ; AND DISMISS.

```

CZVSVAO COLOUR LOOKUP OPTION  
GLOBAL SUBROUTINES SECTION

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```

1079
1080      : SUBROUTINE TO INITIALIZE THE CURRENT UNIT DISPLAY.
1081      : CALL 'CLRW' TO INIT WITH IM'S IN WRITE MODE.
1082      : CALL 'CLRRW' TO INIT WITH IM'S IN WRITE-IN-RETRACE MODE.
1083      :
1084      :
1085 004702 012777 004726 175746 CLRW:  .ENABL  LSB           ; 'WRITE' MODE ENTRY.
1086 004710 000403                SKP3
1087 004712 012777 004742 175736 CLRRW:  MOV      #1$,@DPC       ; 'READ/WRITE' MODE ENTRY.
1088 004720 004737 005214          JSR      PC,WAITF
1089 004724 000207                RTS      PC
1090
1091 004726                1$:  SETUP  WRT,0,1,2,3    ;ALL IM'S TO WRITE MODE...
1092 004736 160000 004752          DJMP,3$
1093 004742                2$:  SETUP  RDWRT,0,1,2,3  ;...OR WRITE-IN-RETRACE MODE...
1094 004752 170140                3$:  CLRMEM
1095 004754 116000                ;...CLEAR IM'S...
1096 004756 000000 000000          APNT!LO
1097 004762 146052                ;...CLEAR DATA LATCH...
1098 004764 173000                0,0
1099                                ;...AND X/Y POSITION...
1100                                CUOFF!CUIOFF
1101                                ;...CURSOR OFF...
1102                                STOPN
1103                                ;...STOP, ALL INTS DISABLED.
1104                                .DSABL  LSB
1105
1106      : ANOTHER TO RELEASE THE DPU.
1107      : EXECUTE 'EXT STOP' IF HE'S RUNNING, 'BUS-INIT' IF HE'S HUNG.
1108      :
1109      :
1110 RELEAS: TST      @DSR
1111          BMI      1$           ;EXIT IF HE'S FREE.
1112          CLR      @DSR         ;XCT 'EXTERNAL STOP'.
1113          JSR      PC,WAITF
1114          BCS      1$           ;EXIT IF STOP WORKED.
1115          BRESET
1116          JSR      PC,WAITF     ;IT DIDN'T, XCT BUS-INIT...
1117          RTS      PC          ;...AND WAIT AGAIN.
1118
1119      1$:

```

CZVSVAO COLOUR LOOKUP OPTION  
GLOBAL SUBROUTINES SECTION

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```

1113
1114      ; SUBROUTINE TO BLAST THE LUT RAM WITH COLOR OR GREY-SCALE DATA.
1115      ;
1116 005016 012701 013026  LUMIN: MOV    #LUMTBL,R1    ; GREY-SCALE TABLE ADDRESS.
1117 005022 012746 000001      MOV    #1,-(SP)        ; LUT WORDS / SHADE.
1118 005026 000404      SKP2+2
1119 005030 012701 014030  NTSC:  MOV    #NTSC8,R1    ; BASIC 8 COLOR TABLE ADDRESS.
1120 005034 012746 000040      MOV    #32,-(SP)       ; LUT WORDS / COLOR.
1121 005040 000404      SKP2+2
1122 005042 012701 014052  CL16:  MOV    #COL16,R1    ; 16 COLOR TABLE.
1123 005046 012746 000020      MOV    #16,-(SP)      ; LUT WORDS / COLOR.
1124 005052 000404      SKP2+2
1125 005054 012701 014114  CL64:  MOV    #COL64,R1    ; 64 COLOR TABLE
1126 005060 012746 000004      MOV    #4,-(SP)      ; LUT WORDS / COLOR
1127
1128 005064 005077 175576      CLR    @LSR           ; ADDR 0, NO INTERRUPTS.
1129 005070 011600      1$:   MOV    (SP),R0       ; SET ITERATION K.
1130 005072 012177 175572      MOV    (R1)+,@LDR     ; BLAST THE RAM.
1131 005076 005777 175564      2$:   TST    @LSR       ; WAIT FOR READY.
1132 005102 100375      BPL    -4
1133 005104 105777 175556      TSTB   @LSR          ; LAST ADDRESS DONE ??
1134 005110 001406      BEQ    3$            ; EXIT IF SO.
1135 005112 005300      DEC    R0
1136 005114 001765      BEQ    1$            ; GET NEXT COLOR.
1137 005116 016177 177776 175544  MOV    -2(R1),@LDR    ; REPEAT THIS COLOR.
1138 005124 000764      BR     2$
1139 005126 005726      3$:   TST    (SP)+       ; FIX THE STACK...
1140 005130 000207      RTS    PC            ;...AND RETURN.
1141
1142      ; BLAST 16 SHADES OF THE BASIC COLOR IN (R1).
1143      ; LOCATION "SHADLY" SET BY CALLER TO PRODUCE
1144      ; A PLEASING VISUAL EFFECT.
1145      ;
1146 005132      SHAD16: BREAK
1147 005134 005077 175526      CLR    @LSR           ; ADDR 0, NO INTERRUPTS.
1148 005140 042701 177356      BIC    #^C421,R1     ; SET DIMMEST SHADE THIS COLOR.
1149 005144 005002      CLR    R2            ; 1ST SHADE IS ALWAYS BLACK.
1150 005146 012703 000020      1$:   MOV    #16.,R3    ; 16 LUT WORDS / SHADE.
1151 005152 010277 175512      2$:   MOV    R2,@LDR    ; WRITE DATA.
1152 005156 005777 175504      TST    @LSR
1153 005162 100375      BPL    -4
1154 005164 013700 002732      MOV    SHADLY,R0     ; DELAY.
1155 005170 005300      DEC    R0
1156 005172 001376      BNE    -2
1157 005174 105777 175466      TSTB   @LSR          ; LUT RAM FULL ??
1158 005200 001404      BEQ    3$            ; EXIT IF SO.
1159 005202 005303      DEC    R3            ; THIS SHADE DONE ??
1160 005204 001362      BNE    2$            ; NOT YET, LOOP.
1161 005206 060102      ADD    R1,R2         ; YES, INCREMENT THE SHADE...
1162 005210 000756      BR     1$            ;...AND CONTINUE.
1163 005212 000207      3$:   RTS    PC

```

CZVSVAO COLOUR LGOKUP OPTION  
GLOBAL SUBROUTINES SECTION

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```

1165
1166      : SUBROUTINE TO WAIT FOR DISPLAY STOP FLAG.
1167      : RETURN WITH 'C' = 1 AS SOON AS STOP OCCURS.
1168      : OTHERWISE, 'C' = 0 AND RETURN AFTER APPROX 300 MSEC.
1169
1170 005214      WAITF: BREAK      ; DO A SUPVSR BREAK FIRST.
1171 005216 012727 005670      MOV      #3000.,(PC)+ ; 300 MSEC TIMER.
1172 005222 005670
1173 005224 005777 175430      1$:      3000.
1174 005230 100407      2$:      TST      @DSR
1175 005232 004737 005276      BMI      3$      ; EXIT ON STOP FLAG.
1176 005236 005337 005222      JSR      PC,US100 ; OTHERWISE, WAIT 100 USEC...
1177 005242 001370      DEC      1$
1178 005244 000241      BNE      2$      ;...AND TRY AGAIN.
1179 005246 000401      CLC      ; C = 0, DPU STILL RUNNING...
1180 005250 000261      SKP1     ;...OR HUNG-UP AFTER 300 MSEC.
1181 005252 000207      3$:      SEC      ; C = 1, DPU IS STOPPED.
1182      RTS      PC
1183
1184      : SUBROUTINES TO PAUSE (WAIT) IN INCREMENTS OF 100 USEC.
1185      : BASED ON AVERAGE TIME (CPU DEPENDANT) TO EXECUTE
1186      : DEC RO
1187      : BNE .-2
1188      : DELAY CONSTANT (K100US) SHOULD BE ADJUSTED AS FOLLOWS:
1189      : FOR SLOW CPU'S (11/03 THRU 10), K100US = 8.
1190      : FOR FAST CPU'S (11/34 THRU 70), K100US = 32.
1191 005254 012746 023420      PAUSE1: MOV      #10000.,-(SP) ; 1 SEC TIMER.
1192 005260 000402      SKP2
1193 005262 012746 011610      PAUS.5: MOV      #5000.,-(SP) ; 1/2 SEC TIMER.
1194 005266 000402      SKP2
1195 005270 012746 000144      PAU.01: MOV      #100.,-(SP) ; 10 MSEC TIMER.
1196 005274 000402      SKP2
1197 005276 012746 000001      US100: MOV      #1.,-(SP) ; 100 USEC TIMER.
1198 005302 013700 005322      1$:      MOV      K100US,RO
1199 005306 005300      DEC      RO
1200 005310 001376      BNE      .-2 ; 100 USEC (MORE OR LESS) LOOP.
1201 005312 005316      DFC      (SP)
1202 005314 001372      BNE      1$ ; VARIABLE LOOP.
1203 005316 005726      TST      (SP)+ ; FIX STACK...
1204 005320 000207      RTS      PC ;...AND RETURN.
1205
1206 005322 000040      K100US: 32. ; 100 USEC TIMER.

```

CZVSVAO CLOUR LOOKUP OPTION  
GLOBAL SUBROUTINES SECTION

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1218 005324 012737 005352 000004
1219 005332
1220 005340 005046
1221 005342 005721
1222 005344 020102
1223 005346 101775
1224 005350 000402
1225 005352 022626
1226 005354 005116
1227
1228 005356
1229 005364 005726
1230 005366 001401
1231 005370 000261
1232 005372 000207
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1234
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1245 005374 005737 002654
1246 005400 100403
1247 005402 005337 005420
1248 005406 001002
1249 005410 000241
1250 005412 000401
1251 005414 000261
1252 005416 000207
1253 005420 000000

: ROUTINE TO TEST FOR A NEXM IN THE RANGE (R1) THRU (R2).
: ON RETURN, IF 'C' = 1, (R1) = NEXM ADDRESS.
: 'C' = 0, ALL ADDRESSES OK.
: CALL: MOV ADR1,R1
: MOV ADR2,R2
: JSR PC,NXM
: RETURN
: TEST 'C' AND PROCEED.
NXM: MOV #2$,@#4
: SET TRAP CATCHER.
GETPRI @#6
: RETAIN CURRENT CPU PRI.
CLR -(SP)
: TRAP FLAG.
1$: TST (R1)+
: TEST THE ADDRESS(ES).
(CMP R1,R2
BLOS 1$
: NO TRAP -- CONTINUE...
BR 3$
: ...TIL DONE.
2$: CMP (SP)+,(SP)+
: TRAP -- FIX STACK...
COM (SP)
: ...SET FLAG...
3$: CLRVEC #4
: GIVE BACK THE VECTOR.
TST (SP)+
: DID ANY TRAP ??
BEQ .+4
: NO, 'C' = 0, SKIP NEXT.
SEC
: YES, 'C' = 1, (R1) = BAD ADDR.
RTS PC

: SUBROUTINE TO EXECUTE TEST ITERATIONS.
: EXIT WITH 'C' SET IF LOOPS ALLOWED AND LOOP COUNT NON-ZERO.
: LOOP COUNTER IS SET BY 'BEGIN.TEST' MACRO.
: CALL: LOOPTO ARG
:
.MACRO LOOPTO TAG
JSR PC,LOOP
BCS TAG
.ENDM LOOPTO
LOOP: TST QVP
: LOOPS DISALLOWED IN QUICK PASS.
BMI 1$
: BUMP LOOP COUNTER.
DEC LOOPK
BNE 2$
1$: CLC
: LOOP DISALLOWED, OR DONE.
SKP1
2$: SEC
: LOOP ENABLED.
RTS PC
LOOPK: 0
: LOOP (ITERATION) COUNTER.

```

CZVSVAO COLOUR LOOKUP OPTION  
GLOBAL SUBROUTINES SECTION

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1264 005422 005037 005532
1265 005426 005037 003234
1266 005432 005237 005472
1267 005436 032737 001000 002726
1268 005444 001410
1269 005446
1270 005466 000207
1271 005470 000000
1272 005472 000000
1273
1274
1275
1276
1277 005474 032737 020000 002726
1278 005502 001412
1279 005504
1280 005530 000207
1281
1282 005532 000000
1283 005534 045 101 040
      005537 045 104 045
      005542 101 040 105
      005545 122 122 117
      005550 122 123 000
1284

```

```

: PRINT THE NUMBER AND NAME OF EACH TEST AS WE GO ALONG.
: INCREMENT "TESTK" TO INDICATE THE NUMBER OF TESTS
: IN THE CURRENT RUN SEQUENCE.
: CLEAR THE ERROR COUNTER AND SIGNATURE EXTENSION FLAGS.
:
: *** NOTE: REQUIRES PRIOR USE OF THE 'BEGIN.TEST' MACRO
: TO SET NAME AND NUMBER POINTERS.
:
TSTGO: CLR      ERRK      : CLEAR LOCAL ERROR COUNTER.
      CLR      EXTA      : CLEAR ERROR EXTENSION FLAG.
      INC      TESTK     : BUMP TEST COUNTER.
      BIT      #PNT,FLAGS : BR IF PNT FLAG
      BEQ      1$        : NOT SET
      PRINTF   TNAM      : PRINT THE TEST TITLE.
      RTS      PC
1$:
TNAM: 0
TESTK: 0 ; NUMBER OF TESTS RUN THIS PASS.
:
: AT END OF EACH TEST, PRINT THE NUMBER OF ERRORS RECEIVED
: IF NORMAL ERROR REPORTING IS DISABLED (FLA:IER).
:
TSTEND: BIT      #IER,FLAGS
      BEQ      1$        : BR IF "IER" NOT SET.
      PRINTF   #ESUM,ERRK : PRINT ERROR COUNT.
1$:
      RTS      PC
ERRK: 0 ; LOCAL ERROR COUNT.
ESUM: .ASCIZ  /%A %D%A ERRORS/
:
      .EVEN

```

CZVSVAO COLOUR LOOKUP OPTION  
GLOBAL SUBROUTINES SECTION

MACRO M1200 28-APR-83 14:05 PAGE 27

```

1286
1287      ; SUBROUTINE TO SET-UP VARIOUS ENVIRONMENTAL PARAMETERS.
1288      ;
1289      ENVIRN: MEMORY R0
1290      MOV      R0, FREE      ; GET 1ST FREE ADDRESS...
1291      MOV      (R0), FRESIZ  ; ...AND WORD COUNT.
1292      MOV      #8., K100US  ; ASSUME LSI FOR 100US TIMER.
1293      READBUS
1294      BCOMPLETE 1$
1295      MOV      #32., K100US  ; NOT LSI -- CHANGE TIMER.
1296      MOV      #60., HZ     ; ASSUME 60 HZ SYSTEM.
1297      CLOCK   L, R0
1298      BNCOMPLETE 2$
1299      CLR      @0(R0)       ; INSURE CLOCK IS OFF.
1300      MOV      6(R0), HZ   ; SET ACTUAL FREQUENCY.
1301      2$:     240, 240
1302      RTS      PC
1303      FREE:   0           ; 1ST FREE MEMORY ADDRESS...
1304      FRESIZ: 0          ; ...AND SIZE (IN WORDS).
1305      HZ:     60.        ; LINE FREQUENCY.
    
```

CZVSVAO COLOUR LOOKUP OPTION MACRO M1200 28-APR-83 14:05 PAGE 29  
INITIALIZE SECTION

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1314 005652  
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1319 005652  
1320 005660  
1321 005662  
1322 005670  
1323 005672  
1324 005700  
1325 005702  
1326 005710  
1327 005712 000137 006272  
1328 005716 012737 177777 002654  
1329 005724 005037 005472  
1330 005730 004737 005554  
1331 005734 000402  
1332 005736 005037 002654  
1333 005742 012737 177777 002652  
1334 005750 023737 002652 002012  
1335 005756 001767  
1336 005760 005237 002652  
1337 005764  
1338 005772  
1339 005774 023737 006330 002012  
1340 006002 001362  
1341 006004  
1342  
1343  
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1345  
1346 006006 012001  
1347 006010 010137 002666  
1348 006014 062701 000002  
1349 006020 010137 002670  
1350 006024 062701 000002  
1351 006030 010137 002672  
1352  
1353 006034 012001  
1354 006036 012037 002674  
1355 006042 010137 002706  
1356 006046 012721 004652  
1357 006052 013721 002674  
1358 006056 012001  
1359 006060 010137 002656  
1360 006064 062701 000002  
1361 006070 010137 002660  
1362 006074 062701 000002  
1363 006100 010137 002662  
1364 006104 062701 000002

.SBTTL INITIALIZE SECTION

:+  
: THE INITIALIZE SECTION CONTAINS THE CODING THAT IS PERFORMED  
: AT THE BEGINNING OF EACH PASS.  
:--

BGNINIT

: IF "START" OR "RESTART", SET QUICK-PASS FLAG.  
: IF "CONTINUE", NOTHING IS REQUIRED.  
:

READEF #EF.START ; INITIAL START...  
BCOMPLETE START ;  
READEF #EF.RESTART ;...OR RESTART.  
BCOMPLETE START ;  
READEF #EF.NEW ; BEGIN NEW PASS.  
BCOMPLETE NEWPAS ;  
READEF #EF.CONTINUE ; NONE OF THE ABOVE.  
BNCOMPLETE NXTU ; CONTINUE (FROM ^C HALT).  
JMP CNTNU ; 1ST PASS, SET QUICK VERIFY...  
START: MOV #-1,QVP ; ...CLEAR TOTAL TEST COUNT...  
CLR TESTK ; ...AND SET ENVIRONMENT.  
JSR PC,ENVIRN ;  
SKP2 ;  
NEWPAS: CLR QVP ; NEXT PASS, ALLOW ITERATIONS.  
MOV #-1,UUT ; INIT UNIT NUMBER.  
NXTU: CMP UUT,L\$UNIT ;  
BEQ NEWPAS ; BR IF ALL UNITS DONE.  
INC UUT ; OTHERWISE, GET NEXT UNIT...  
GPHARD UUT,RO ; ...P-TABLE POINTER.  
BCOMPLETE 1\$ ; BR IF UNIT AVAILABLE.  
CMP DEADU,L\$UNIT ; ANY UNITS LEFT ??  
BNE NXTU ; YES, TRY ANOTHER.  
DOCLN ; NO -- ABORT (HALT) !!

: NOW SET A BUNCH OF POINTERS FOR THIS UNIT.  
: RO POINTS TO THE CURRENT UNIT'S P-TABLE.  
:

1\$: MOV (RO)+,R1 ; GET 1ST P-TABLE ENTRY.  
MOV R1,LSR ; SET LUT CSR...  
ADD #2,R1 ;  
MOV R1,LDR ;...DATA...  
ADD #2,R1 ;  
MOV R1,LMR ;...AND MAINT ADDRESSES.  
MOV (RO)+,R1 ; GET VECTOR ADDRESS...  
MOV (RO)+,DPRI ;...AND PRIORITY.  
MOV R1,L!TV ;  
MOV #LDUN,(R1)+ ; AND SET UP THE VECTOR.  
MOV DPRI,(R1)+ ;  
MOV (RO)+,R1 ;  
MOV R1,DPC ; SET DISPLAY PC ADDRESS  
ADD #2,R1 ;  
MOV R1,DSR ; SET DISPLAY STATUS REG  
ADD #2,R1 ;  
MOV R1,DXR ; DISP X POSN REG  
ADD #2,R1 ;  
:

CZVSVAO COLOUR LOOKUP OPTION      MACRO M1200    28-APR-83 14:05    PAGE 29-1  
INITIALIZE SECTION

```

1365 006110 010137 002664      MOV      R1,DYR      : DISP Y POSN REG
1366 006114 012001              MOV      (R0)+,R1    : GET VS11 VECTOR
1367 006116 010137 002676      MOV      R1,STPV     : SET UP FIRST VEVTOR
1368 006122 012721 004604      MOV      #DSTP,(R1)+ :
1369 006126 013721 002674      MOV      DPRI,(R1)+  :
1370 006132 010137 002700      MOV      R1,JSMV     : SECOND VECTOR
1371 006136 012721 004610      MOV      #DJM,(R1)+  :
1372 006142 013721 002674      MOV      DPRI,(R1)+  :
1373 006146 010137 002702      MOV      R1,TOTV     : THIRD VECTOR
1374 006152 012721 004556      MOV      #DIO,(R1)+  :
1375 006156 013721 002674      MOV      DPRI,(R1)+  :
1376 006162 010137 002704      MOV      R1,JSSV     : LAST VECTOR
1377 006166 012721 004614      MOV      #DJS,(R1)+  :
1378 006172 013721 002674      MOV      DPRI,(R1)+  :
1379 006176 005737 002654      TST      QVP         : 1ST PASS ??
1380 006202 001002              BNE      2$          : SKIP NEXT IF SO.
1381 006204 000137 006272      JMP      CNTNU       : OTHERWISE, SKIP INITIALIZATION.
1382
1383      : ON 1ST (QV) PASS, VERIFY THAT THE LUT ADDRESSES ARE OK.
1384      : AND THE DATA PROCESSOR (VS11) ADDRESSES ARE OK
1385      : IF ANY ADDRESS IS NOT THERE, REPORT ERROR
1386
1387 006210 005037 003234      2$: CLR      EXTA      : CLEAR ERROR EXTENSION FLAG.
1388 006214 013701 002666      MOV      LSR,R1
1389 006220 013702 002672      MOV      LMR,R2
1390 006224 004737 005324      JSR      PC,NXM      : TEST LUT REGISTERS...
1391 006230 103010              BCC      4$          : ...AND BR IF ALL OK.
1392 006232              ERRDF  1,NXR,NXRERR : NEXM REGISTER ERROR.
1393 006242              DODU   UUT          : AUTO-DROP THIS UNIT...
1394 006250 000637              BR      NXTU        : ...AND GO FOR ANOTHER.
1395
1396 006252 013701 002656      4$: MOV      DPC,R1    : GET DPU ADDRESS.
1397 006256 013702 002664      MOV      DYR,R2     : LAST DPU ADDRESS.
1398 006262 004737 005324      JSR      PC,NXM     : TEST THE REGISTERS
1399 006266 103001              BCC      CNTNU      : CONTINUE IF OK
1400 006270 000760              BR      3$          : ELSE, REPORT ERROR
1401
1402
1403 006272 012737 177777 002730 CNTNU: MOV      #-1,LUTAV   : FOR COMPATABILITY ONLY.
1404 006300              RFLAGS  FLAGS     : GET FLAG REGISTER (SWR).
1405 006306              SETPRI #PRI00    : LOWER THE RUN PRIORITY...
1406 006314              ENDINIT          : ...AND START 'EM UP.
1407
1408      : THIS SECTION IS FOR LOAD DEVICE PROTECTION.
1409
1410 006316              BGNPROT
1411 006316 177777 177777 177777      -1, -1, -1      : NO DEVICE PROTECTION REQUIRED.
1412 006324              ENDPROT

```

CZVSVAO COLOUR LOOKUP OPTION  
DROP AND ADD UNITS SECTIONS

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1419 006324
1420 006324
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1430 006326
1431 006326 005227
1432 006330 000000
1433 006332 023737 006330 002012
1434 006340 003404
1435 006342 013737 002012 006330
1436 006350 000423
1437 006352
1438 006372 000412
1439 006374 045 101 040
      006377 040 125 116
      006402 111 124 040
      006405 104 122 117
      006410 120 120 105
      006413 104 045 116
      006416 000
1440
1441 006420
1442
1443
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1446 006422
1447 006422 005337 006330
1448 006426 100003
1449 006430 005037 006330
1450 006434 000422
1451 006436
1452 006456 000411
1453 006460 045 101 040
      006463 040 125 116
      006466 111 124 040
      006471 101 104 104
      006474 105 104 045
      006477 116 000
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1455 006502

```

.SBTTL DROP AND ADD UNITS SECTIONS

:++  
: AUTO-DROP CODE SECTION.

:--  
 BGNAUTO  
 ENDAUTO ; UNUSED.

:++  
: THE DROP-UNIT SECTION CONTAINS OPTIONAL CODING TO BE EXECUTED  
: FOLLOWING THE REMOVAL (DROP) OF A DEVICE FROM THE TEST LIST.

: 'DROPPED' UNITS ARE RE-SELECTED ON OPERATOR 'STA' OR 'ADD'  
: COMMAND, OTHERWISE REMAIN INACTIVE. THE 'DISPLAY' COMMAND  
: WILL PRINT THE P-TABLES OF ALL UNITS AND SHOW WHICH ARE  
: DROPPED WHICH ARE STILL ACTIVE.

:--  
 BGNDU  
 INC (PC)+ ; KEEP TOTAL NUMBER OF...  
DEADU: 0 ; ...UNITS DROPPED HERE.  
 CMP DEADU,LSUNIT  
 BLE 1\$  
 MOV LSUNIT,DEADU ; DON'T DROP MORE THAN WE HAVE.  
 BR 3\$ ; JUST GO AWAY.  
1\$: PRINTF #2\$  
 BR 3\$  
2\$: .ASCIZ /%A UNIT DROPPED%N/

3\$: .EVEN  
 ENDDU

:++  
: THE ADD-UNIT SECTION CONTAINS OPTIONAL CODING TO BE EXECUTED  
: FOLLOWING THE ADDITION OF A DEVICE TO THE TEST LIST.

:--  
 BGNAU  
 DEC DEADU ; ADJUST DEAD UNIT COUNTER.  
 BPL 1\$  
 CLR DEADU ; CAN'T ADD MORE THAN WE HAD...  
 BR 3\$ ; ...TO START WITH.  
1\$: PRINTF #2\$

2\$: .ASCIZ /%A UNIT ADDED%N/

3\$: .EVEN  
 ENDAU

CZVSVAO COLOUR LOOKUP OPTION MACRO M1200 28-APR-83 14:05 PAGE 31  
 CLEAN-UP AND REPORT CODING SECTIONS

1457  
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 1464 006504  
 1465 006504 005737 002656  
 1466 006510 001404  
 1467 006512 004737 004766  
 1468 006516 004737 004702  
 1469 006522 005077 174140  
 1470 006526  
 1471  
 1472  
 1473  
 1474  
 1475 006530  
 1476  
 1477  
 1478 006530

```
.SBTTL CLEAN-UP AND REPORT CODING SECTIONS

:++
: THE CLEANUP CODING SECTION CONTAINS THE CODING THAT IS
: EXECUTED AT THE END OF EACH PASS (OR SUB-PASS).
: USE TO RETURN DEVICE UNDER TEST TO A NEUTRAL STATE.
:--
      BGNCLN
      TST      DPC
      BEQ      1$      ; BR IF NO DPU INSTALLED.
      JSR      PC,RELEAS ; CHECK FOR 'HUNG' DPU.
      JSR      PC,CLRW  ; CLEAR IM'S, VIDEO OFF.
1$:   CLR      @LSR    ; CLEAR LUT STATUS.
      ENDCLN

:++
:
:
      BGNRPT
:
:
      ENDRPT      ; NO USED
```

```

1480 .SBTTL
1481 .SBTTL HARDWARE TEST SECTION.
1482 .SBTTL
1483 .SBTTL TEST 1 LOOK-UP-TABLE LOGIC TEST
1484
1485 ;*****
1486 006532 BEGIN.TEST <LOGIC TEST>,40
1487 ;*****
1488
1489 ; FIRST, CHECK THE READY BIT AND THE INTERRUPT FUNCTIONS.
1490 ; REPEAT THE INTERRUPT TESTS 40 TIMES AFTER QUICK PASS.
1491
1492 006570 004737 005422 LUTTST: JSR PC,TSTGO ; TITLE
1493 006574 005077 174066 1$: CLR @LSR ; CLEAR STATUS REGISTER.
1494 006600 005037 002720 CLR ILSR ; USE AS INT REC'D FLAG.
1495 006604 012777 012000 174054 MOV #LREAD!LDI,@LSR ; READ LOC 0, INT WHEN DONE.
1496 006612 005777 174050 TST @LSR
1497 006616 100375 BPL .-4
1498 006620 005737 002720 TST ILSR
1499 006624 001006 BNE 2$ ; BR IF INTERRUPT RECEIVED.
1500 006626 005237 005532 INC ERRK ; OTHERWISE...
1501 006632 HRDERR NLRI,LINTER ;...ERROR.
1502 006642 005037 002720 2$: CLR ILSR
1503 006646 005077 174016 CLR @LDR ; WRITE LOC 1, INT WHEN DONE.
1504 006652 005777 174010 TST @LSR
1505 006656 100375 BPL .-4
1506 006660 005737 002720 TST ILSR
1507 006664 001006 BNE 3$ ; BR IF INTERRUPT RECEIVED.
1508 006666 005237 005532 INC ERRK ; OTHERWISE...
1509 006672 HRDERR NLWI,LINTER ;...ERROR.
1510 006702 005037 002720 3$: CLR ILSR
1511 006706 042777 002000 173752 BIC #LDI,@LSR ; NOW, TURN INTERRUPTS OFF.
1512 006714 052777 010000 173744 BIS #LREAD,@LSR ; READ LOC 2.
1513 006722 005777 173740 TST @LSR
1514 006726 100375 BPL .-4
1515 006730 005737 002720 TST ILSR
1516 006734 001406 BEQ 4$ ; BR IF INTERRUPT NOT RECEIVED.
1517 006736 005237 005532 INC ERRK ; OTHERWISE...
1518 006742 HRDERR ULRI,LINTER ;...F ?
1519 006752 005037 002720 4$: CLR ILSR
1520 006756 005077 173706 CLR @LDR ; WF . LOC 3.
1521 006762 005777 173700 TST @LSR
1522 006766 100375 BPL .-4
1523 006770 005737 002720 TST ILSR
1524 006774 001406 BEQ 5$ ; BR IF INTERRUPT NOT RECEIVED.
1525 006776 005237 005532 INC ERRK ; OTHERWISE...
1526 007002 HRDERR ULWI,LINTER ;...ERROR.
1527 007012 5$: LOOPTO 1$ ; REPEAT 'TIL LOOPER EXPIRES...
;...THEN FALL THRU.
1528
1529
1530 ; NOW TEST THAT THE LUT ADDRESS AUTO-INCREMENTS CORRECTLY.
1531 ; DO ALTERNATE READS AND WRITES (WITHOUT INTERRUPTS)
1532 ; OVER THE FULL LUT ADDRESS RANGE.
1533
1534 007020 BGNSUB ; ***START SUBTEST 1.1***
1535
1536 007022 LUTAI: BREAK

```

CZVSVAO COLOUR LOOKUP OPTION MACRO M1200 28-APR-33 14:05 PAGE 32-1  
 TEST 1 LOOK-UP-TABLE LOGIC TEST

```

1537 007024 005077 173636          CLR    @LSR          ; START AT LUT ADDR 0.
1538 007030 005001                   CLR    R1            ;
1539 007032 005201                   INC    R1            ; SET EXPECTED RETURN.
1540 007034 052777 010000 173624 1$:  BIS    #LREAD,@LSR   ; READ A LOCATION.
1541 007042 005777 173620           TST    @LSR          ; TEST FOR READY...
1542 007046                   BREAK
1543 007050 100374                   BPL    .-6           ;...WHEN READY.
1544 007052 017702 173610           MOV    @LSR,R2       ; GET RESULT...
1545 007056 042702 177400           BIC    #^C377,R2
1546 007062 120201                   CMPB   R2,R1
1547 007064 001410                   BEQ    3$            ; BR IF IT'S RIGHT.
1548 007066 005237 005532           INC    ERRK
1549 007072                   HRDERR LAIER,LRWERR
1550 007102 010177 173560           2$:  MOV    R1,@LSR    ; CORRECT CSR AFTER ERROR.
1551 007106 005201                   3$:  INC    R1        ; SET NEXT EXPECTED ADDRESS.
1552 007110 005077 173554           CLR    @LDR          ; WRITE THE NEXT LOC.
1553 007114 005777 173546           TST    @LSR          ; TEST FOR READY...
1554 007120                   BREAK
1555 007122 100374                   BPL    .-6           ;...WHEN READY.
1556 007124 017702 173536           MOV    @LSR,R2       ; GET RESULT...
1557 007130 042702 177400           BIC    #^C377,R2
1558 007134 120201                   CMPB   R2,R1
1559 007136 001410                   BEQ    5$
1560 007140 005237 005532           IIC    ERRK
1561 007144                   HRDERR LAIEW,LRWERR
1562 007154 010177 173506           4$:  MO'   R1,@LSR    ; CORRECT CSR AFTER ERROR.
1563 007160 105777 173502           5$:  TST   @LSR      ; FULL ADDRESS RANGE DONE ??
1564 007164 001322                   BNE   1$            ; LOOP IF NOT.
1565
1566 007166                   ; ENDSUB
1567
1568                   ; NOW CHECK THE CLEAR/SET FUNCTION.
1569
1570 007170                   ; BGNSUB
1571
1572 007172                   ; LUTCLR: BREAK
1573 007174 005001                   CLR    R1            ; SET EXPECTED DATA.
1574 007176 010103                   1$:  MOV    R1,R3      ; USE R3 FOR THE "SET" COMMAND.
1575 007200 052703 010000           BIS    #LSET,R3
1576 007204 005077 173456           CLR    @LSR          ; LUT ADDRESS 0, NO INTERRUPTS.
1577 007210 010377 173454           MOV    R3,@LDR       ; SET ALL LUT ADDRESSES TO (R3).
1578 007214 005777 173446           TST    @LSR
1579 007220 100375                   BPL    .-4           ; WAIT 'TIL DONE.
1580 007222 005077 173440           CLR    @LSR          ; RESET TO ADDR 0.
1581 007226 052777 010000 173432 2$:  BIS    #LREAD,@LSR   ; READ 1ST/NEXT LOCATION.
1582 007234 005777 173426           TST    @LSR
1583 007240 100375                   BPL    .-4
1584 007242 017702 173422           MOV    @LDR,R2       ; GET REC'D DATA.
1585 007246 042702 170000           BIC    #^C777,R2     ; MASK DATA BITS.
1586 007252 020102                   CMP    R1,R2
1587 007254 001406                   BEQ    3$            ; BR IF DATA OK.
1588 007256 005237 005532           INC    ERRK
1589 007262                   HRDERR LDINC,LRWERR
1590 007272 105777 173370           3$:  TST   @LSR      ; LAST ADDRESS TESTED ??
1591 007276 001353                   BNE   2$            ; CONTINUE READING IF NOT.
1592 007300 006301                   ASL   R1              ; SLIDE EXP'D DATA TO THE LEFT.
1593 007302 032701 010000           BIT    #BIT12,R1
    
```

CZVSVA0 COLOUR LOOKUP OPTION MACRO M1200 28-APR-83 14:05 PAGE 32-2  
TEST 1 LOOK-UP-TABLE LOGIC TEST

```

1594 007306 001001          BNE      4$          ; SKIP NEXT WHEN BIT 12 IS SET.
1595 007310 005201          INC      R1           ; ELSE, INSERT ANOTHER BIT.
1596 007312 042701 170000   4$:      BIC      #^C7777,R1    ; MASK NEW EXP'D DATA.
1597 007316 001327          BNE      1$          ; LOOP 'TIL WE RETURN TO 0.
1598
1599 007320          ; ENDSUB
1600          ; FINALLY, BLAST THE LUT TO THE GREY-SCALE TABLE AND CHECK IT.
1601          ;
1602          ;
1603 007322          ; BGNSUB          ; ***START SUBTEST 1.3***
1604          ;
1605 007324          ; LUTGSD: BREAK
1606 007326 004737 005016   JSR      PC,LUMIN    ; BLAST GREY-SCALE DATA.
1607 007332 012703 013026   MOV      #LUMTBL,R3 ; TABLE POINTER
1608 007336 005077 173324   CLR      @LSR        ; START AT ADDR 0.
1609 007342 012301          1$:      MOV      (R3)+,R1    ; SET EXPECTED DATA.
1610 007344 052777 010000 173314  BIS      #LREAD,@LSR ; XCT READ COMMAND.
1611 007352 005777 173310   TST      @LSR
1612 007356 100375          BPL      -4
1613 007360 017702 173304   MOV      @LDR,R2     ; GET DATA
1614 007364 042702 170000   BIC      #^C7777,R2
1615 007370 020102          CMP      R1,R2
1616 007372 001406          BEQ      2$          ; BR IF DATA OK
1617 007374 005237 005532   INC      ERRK
1618 007400          HRDERR LDINC,LRWERR
1619 007410 105777 173252   2$:      TSTB     @LSR    ; LAST LUT ADDRESS DONE ??
1620 007414 001352          BNE      1$          ; LOOP IF NOT.
1621          ;
1622 007416          ; ENDSUB
1623          ;
1624 007420 005077 173242   CLR      @LSR        ; YES, CLEAR LUT STATUS...
1625 007424 004737 005474   JSR      PC,TSTEND  ; ...AND QUIT.
1626 007430          ENDTST

```



CZVSVAO COLOUR LOOKUP OPTION MACRO M1200 28-APR-83 14:05 PAGE 34  
TEST 3 LOOK-UP-TABLE ANALOG VERIFICATION

```

1663          .SBTTL TEST 3 LOOK-UP-TABLE ANALOG VERIFICATION
1664
1665          ;*****
1666 007606    ; BEGIN.TEST <ANALOG VERIFICATION USING MAINT REGISTER>
1667          ;*****
1668          ;
1669          ; RUN ALL DACS THRU THEIR FULL INPUT RANGE AND MONITOR THE
1670          ; MAINTENANCE THRESHOLD CROSS-OVER POINTS.
1671          ; MDAC LEVELS ARE: 0.07, 0.42, 1.00, AND 1.35.
1672          ; DO EACH DAC TWICE -- GAMMA ON VS GAMMA OFF.
1673          ;
1674 007702    004737 005422    LUTGAV: JSR    PC,TSTGO
1675 007706    004737 004712          JSR    PC,CLRRW          ; CLEAR IM'S.
1676 007712    004737 005214          JSR    PC,WAITF
1677 007716    012737 004540 004554 1$:  MOV    #GON,GCX          ; INIT GAMMA ON TEXT...
1678 007724    005037 010544          CLR    GCBIT            ; ...AND TOGGLE SUBROUTINE.
1679 007730    012737 000455 003224    MOV    #EN+1,ERRNBR      ; SET UP ERROR TABLE.
1680 007736    012737 000002 003222    MOV    #2,ERRTYP        ; 2 = HARD ERROR.
1681 007744    012737 003120 003230    MOV    #DACERR,ERRBLK   ; SIGNATURE POINTER.
1682
1683 007752    012701 000017          RED1:  MOV    #17,R1          ; RED DAC RANGE 0-17...
1684 007756    012702 000001          MOV    #1,R2            ; ...DELTA 1.
1685 007762    012703 011136          MOV    #RDAC,R3         ; POINT TO RED DAC BUFFER.
1686 007766    012704 000020          MOV    #REDC,R4         ; SET RED DAC TEST BIT.
1687 007772    012737 004227 003226    MOV    #RDERR,ERRMSG
1688 010000    012737 010550 003234    MOV    #REDSUM,EXTA
1689 010006    004737 010212          JSR    PC,TSTDAC        ; TEST RED DAC.
1690 010012    004737 010512          1$:  JSR    PC,GAMMA        ; TOGGLE GAMMA BIT...
1691 010016    001355          BNE    RED1            ; ...AND DO IT AGAIN.
1692
1693 010020    012701 000360          GRN1:  MOV    #360,R1        ; GREEN DAC RANGE 0-360...
1694 010024    012702 000020          MOV    #20,R2           ; ...DELTA 20 (1 GREEN BIT).
1695 010030    012703 011146          MOV    #GDAC,R3         ; POINT TO GREEN DAC BUFFER.
1696 010034    012704 000010          MOV    #GRNC,R4         ; GRN DAC TEST BIT.
1697 010040    012737 004247 003226    MOV    #GDERR,ERRMSG
1698 010046    012737 010562 003234    MOV    #GRNSUM,EXTA
1699 010054    004737 010212          JSR    PC,TSTDAC        ; TEST GREEN DAC.
1700 010060    004737 010512          1$:  JSR    PC,GAMMA
1701 010064    001355          BNE    GRN1
1702
1703 010066    012701 007400          BLU1:  MOV    #7400,R1       ; BLUE DAC RANGE 0-7400...
1704 010072    012702 000400          MOV    #400,R2          ; ...DELTA 400 (1 BLUE BIT).
1705 010076    012703 011156          MOV    #BDAC,R3         ; POINT TO BLUE DAC BUFFER.
1706 010102    012704 000004          MOV    #BLUC,R4         ; BLUE DAC TEST BIT.
1707 010106    012737 004271 003226    MOV    #BDERR,ERRMSG
1708 010114    012737 010574 003234    MOV    #BLUSUM,EXTA
1709 010122    004737 010212          JSR    PC,TSTDAC        ; TEST BLUE DAC.
1710 010126    004737 010512          1$:  JSR    PC,GAMMA
1711 010132    001355          BNE    BLU1
1712
1713 010134    012701 007777          CMP1:  MOV    #7777,R1       ; COMPOSITE RANGE 0-7777...
1714 010140    012702 000421          MOV    #421,R2          ; ...DELTA 421 (1R, 1G, AND 1B).
1715 010144    012703 011166          MOV    #CDAC,R3         ; POINT TO COMPOSITE BUFFER.
1716 010150    012704 000040          MOV    #CVC,R4          ; COMPOSITE DAC TEST BIT.
1717 010154    012737 004312 003226    MOV    #CDERR,ERRMSG
1718 010162    012737 010606 003234    MOV    #CMPSUM,EXTA
1719 010170    004737 010212          JSR    PC,TSTDAC        ; TEST COMPOSITE VIDEO DAC.

```

CZVSVAD COLOUR LOOKUP OPTION MACRO M1200 28-APR-83 14:05 PAGE 34-1  
TEST 3 LOOK-UP-TABLE ANALOG VERIFICATION

1720 010174 004737 010512  
1721 010200 001355  
1722  
1723 010202 004737 005474  
1724 010206  
1725  
1726  
1727  
1728  
1729  
1730  
1731  
1732  
1733  
1734  
1735 010212 010105  
1736 010214 010246  
1737 010216 010346  
1738 010220 012701 177777  
1739 010224 010123  
1740 010226 010123  
1741 010230 010123  
1742 010232 010123  
1743 010234 011603  
1744 010236 005001  
1745 010240 005002  
1746 010242 053702 010544  
1747 010246 005077 172414  
1748 010252 010277 172414  
1749 010256 012700 010000  
1750 010262 050100  
1751 010264 010077 172400  
1752 010270 005777 172372  
1753 010274  
1754 010276 100374  
1755 010300 004737 005262  
1756 010304 030477 172362  
1757 010310 001405  
1758 010312 010123  
1759 010314 005202  
1760 010316 032702 000003  
1761 010322 001404  
1762 010324 066601 000002  
1763 010330 020105  
1764 010332 101745  
1765 010334 012601  
1766 010336 012600  
1767 010340 005737 002516  
1768 010344 001402  
1769 010346 000137 010420  
1770  
1771  
1772 010352 012737 004421 004552  
1773 010360 012737 000456 003224  
1774 010366 012702 000C04  
1775 010372 022127 177777  
1776 010376 001403

1\$: JSR PC,GAMMA  
BNE CMP1  
JSR PC,TSTEND  
EXIT TST  
: SUBROUTINE TO TEST THE DACS.  
: (R1) = MAX LUT DATA FOR THIS DAC, (R2) = DATA INCREMENT.  
: (R3) = DATA BUFFER POINTER, (R4) = MDAC COMPARE BIT.  
: BLAST THE LUT TO THE APPROPRIATE DATA, WAIT, THEN  
: SEE IF DAC OUPUT EXCEEDS THRESHOLD.  
: IF SO, SAVE CROSSOVER VALUE, AND INCREASE THRESHOLD.  
: CONTINUE OVER THE ENTIRE DAC INPUT RANGE.  
: THEN TEST THE OBSERVED VALUES AGAINST THOSE EXPECTED.  
TSTDAC: MOV R1,R5 ; MOVE MAX OVER TO R5.  
MOV R2,-(SP) ; SAVE DELTA...  
MOV R3,-(SP) ; ...AND POINTER ON STACK.  
MOV #-1,R1  
MOV R1,(R3)+ ; NULL THE RECEIVING BUFFER.  
MOV R1,(R3)+  
MOV R1,(R3)+  
MOV R1,(R3)+  
MOV (SP),R3 ; AND RESET THE POINTER.  
CLR R1 ; USE (R1) AS CURRENT DATA...  
CLR R2 ; ...AND (R2) AS MDAC THRESHOLD...  
BIS GCBIT,R2 ; ...WITH GAMMA ON/OFF.  
1\$: CLR @LSR ; SET LUT ADDRESS 0.  
MOV R2,@LMR ; SET MDAC THRESHOLD.  
MOV #LSET,R0 ; USE "SETALL" FUNCTION...  
BIS R1,R0 ; ...INSERT DATA BITS...  
MOV R0,@LDR ; ...AND BLAST AWAY !!!  
2\$: TST @LSR  
BREAK  
BPL 2\$ ; WAIT FOR READY  
JSR PC,PAUS.5 ; WAIT A BIT FOR MAINT DAC  
BIT R4,@LMR ; DAC OUT > THRESHOLD ???  
BEQ 3\$ ; BR IF NOT.  
MOV R1,(R3)+ ; YES, SAVE CROSSOVER VALUE...  
INC R2 ; ...AND SET NEXT THRESHOLD.  
BIT #3,R2 ; 4 TRANSITIONS DONE ??  
BEQ 4\$ ; CHECK RESULTS IF SO.  
3\$: ADD 2(SP),R1 ; NO, INCREMENT INPUT DATA.  
CMP R1,R5 ; INPUT LEVEL MAX ??  
BLOS 1\$ ; NOT YET, CONTINUE.  
4\$: MOV (SP)+,R1 ; NOW RECALL BUFFER POINTER...  
MOV (SP)+,R0 ; ...AND DELTA (TOLERANCE).  
TST @#TOL ; IF TOL = 0  
BEQ GONOGO ; CHECK RESULTS, USING 'GO-NOGO'.  
JMP TOLER ; ELSE, 'JMP TOLER' TO TEST...  
: \*\*\*\*\* GO-NOGO TEST \*\*\*\*\*  
GONOGO: MOV #DACX2,DACX ; POINT TO GO-NOGO MESSAGE.  
MOV #EN+2,ERRNBR ; SET ERROR NUMBER 2 FOR GO-NOGO  
MOV #4,R2 ; ALL WE CARE ABOUT IS THAT WE...  
1\$: CMP (R1)+,#-1 ; ...CROSS ALL 4 MAINT THRESHOLDS.  
BEQ 2\$ ; IF NOT -- ERROR.

CZVSVAO COLOUR LOOKUP OPTION MACRO M1200 28-APR-83 14:05 PAGE 34-2  
 TEST 3 LOOK-UP-TABLE ANALOG VERIFICATION

```

1777 010400 005302          DEC      R2
1778 010402 001373          BNE     1$
1779 010404 000401          SKP1
1780 010406                2$:      ERROR          ; OK -- EXIT.
1781 010410 000240 000240 000240 240,240,240 ; *** ERROR ***
1782 010416 000207          RTS     PC          ; DUMMY -- BUG IN ERROR HANDLER ON 'HOE'
1783                                ;***** TOLERANCE TEST *****
1784 010420 012737 004340 004552 TOLER: MOV     #DACX1,DACX ; POINT TO VALUE INCORRECT MESSAGE
1785 010426 010102          MOV     R1,R2
1786 010430 062702 000040          ADD     #40,R2      ; SET SPEC DATA POINTER...
1787 010434 012703 000004          MOV     #4,R3      ;...AND LOOP COUNT.
1788 010440 005737 010544          TST     GCBIT
1789 010444 001402          BEQ     1$          ; BR IF GAMMA ON.
1790 010446 062702 000040          ADD     #40,R2      ; OTHERWISE, ADJUST POINTER.
1791 010452 012204          1$:      MOV     (R2)+,R4
1792 010454 162104          SUB     (R1)+,R4    ; SPEC - OBSERVED.
1793 010456 001405          BEQ     3$          ; BR IF NO DIFFERENCE.
1794 010460 000240          NOP
1795 010462 100001          BPL     2$          ; *** BR 4$ (407) TO DISABLE TOL ***
1796 010464 005404          NEG     R4          ; MAKE ABS DIFFERENCE...
1797 010466 160004          2$:      SUB     R0,R4      ;... -1 BIT TOLERANCE.
1798 010470 003003          BGT     4$          ; *** TOLERANCE EXCEEDED ***
1799 010472 005303          3$:      DEC     R3
1800 010474 001366          BNE     1$
1801 010476 000401          SKP1
1802 010500          4$:      ERROR          ; OK -- SKIP NEXT.
1803 010502 000240 000240 000240 240,240,240 ; *** ERROR ***
1804 010510 000207          RTS     PC          ; DUMMY -- SAME BUG AS BEFORE.
1805                                ;
1806                                ; SUBROUTINE TO TOGGLE THE GAMMA BIT AND TEXT POINTER.
1807                                ;
1808 010512 012700 000100          GAMMA: MOV     #GCOFF,R0
1809 010516 074037 010544          XOR     R0,GCBIT    ; TOGGLE GAMMA ON/OFF.
1810 010522 001404          BEQ     1$          ; BR IF 'ON'.
1811 010524 012737 004545 004554          MOV     #GOFF,GCX   ; POINT TO 'OFF'.
1812 010532 000403          SKP3
1813 010534 012737 004540 004554 1$:      MOV     #GON,GCX    ; POINT TO 'ON'.
1814 010542 005727          TST     (PC)+
1815 010544 000000          GCBIT: 0
1816 010546 000207          RTS     PC
1817                                ;
1818                                ; ON ANY ERROR, THESE EXTENSIONS SHOW EXP'D VS REC'D.
1819                                ;
1820 010550 012701 011176          REDSUM: MOV     #RSPEC,R1
1821 010554 012702 011136          MOV     #RDAC,R2
1822 010560 000404          SKP2+2
1823 010562 012701 011206          GRNSUM: MOV     #GSPEC,R1
1824 010566 012702 011146          MOV     #GDAC,R2
1825 010572 000404          SKP2+2
1826 010574 012701 011216          BLUSUM: MOV     #BSPEC,R1
1827 010600 012702 011156          MOV     #BDAC,R2
1828 010604 000404          SKP2+2
1829 010606 012701 011226          CMPSUM: MOV     #CSPEC,R1
1830 010612 012702 011166          MOV     #CDAC,R2
1831                                ;
1832 010616 005237 005532          INC     ERRK        ; BUMP ERROR COUNT.
1833 010622 005737 010544          TST     GCBIT

```

CZVSVAO COLOUR LOOKUP OPTION MACRO M1200 28-APR-83 14:05 PAGE 34-3  
 TEST 3 LOOK-UP-TABLE ANALOG VERIFICATION

```

1834 010626 001402          BEQ      .+6          ; SKIP NEXT IF GAMMA ON.
1835 010630 062701 000040  ADD      #40,R1       ; OTHERWISE, ADJUST SPEC PTR.
1836 010634 010137 010662  MOV      R1,1$       ; SET EXPECTED...
1837 010640 010237 010672  MOV      R2,2$       ; ...AND RECEIVED POINTERS.
1838 010644 004537 010676  JSR      R5,D04      ; PRINT THRESHOLDS.
1839 010650 010766 000000  THRSR,0
1840 010654 004537 010676  JSR      R5,D04      ; PRINT 'EXPECTED' DATA.
1841 010660 011047          EXP
1842 010662 000000          0 1$:
1843 010664 004537 010676  JSR      R5,D04      ; PRINT 'RECEIVED' DATA.
1844 010670 011070          REC
1845 010672 000000          0 2$:
1846 010674 000207          RTS      PC
1847
1848 010676          D04: PRINTX (R5)+      ; PRINT TEXT.
1849 010714 012501          MOV      (R5)+,R1    ; GET DATA POINTER...
1850 010716 001422          BEQ      3$          ; ...RETURN IF NONE.
1851 010720 012702 000004  MOV      #4,R2
1852 010724 012703 011111  1$: MOV      ^DATA,R3    ; ASSUME VALID DATA.
1853 010730 005711          TST      (R1)
1854 010732 100002          BPL      2$          ; SKIP NEXT IF SO.
1855 010734 012703 011123  MOV      #NULL,R3
1856 010740          2$: PRINTX R3,(R1)+  ; PRINT DATA (OR NULL)...
1857 010760 005302          DEC      R2
1858 010762 001360          BNE     1$          ;...4 TIMES.
1859 010764 000205          3$: RTS      R5
1860
1861 010766          045 116 045 THRSR: .ASCIZ '%N% A THRESHOLD: 0.07V 0.42V 1.00V 1.35V/
      010771          101 040 040
      010774          124 110 122
      010777          105 123 110
      011002          117 114 104
      011005          072 040 040
      011010          040 060 056
      011013          060 067 126
      011016          040 040 040
      011021          060 056 064
      011024          062 126 040
      011027          040 040 061
      011032          056 060 060
      011035          126 040 040
      011040          040 061 056
      011043          063 065 126
      011046          000
1862 011047          045 116 045 EXP: .ASCIZ '%N% A EXPECTED:/
      011052          101 040 040
      011055          040 105 130
      011060          120 105 103
      011063          124 105 104
      011066          072 000
1863 011070          045 116 045 REC: .ASCIZ '%N% A RECEIVED:/
      011073          101 040 040
      011076          040 122 105
      011101          103 105 111
      011104          126 105 104
      011107          072 000
1864 011111          045 101 040 DATA: .ASCIZ '%A %04/
    
```

CZVSVA0 COLOUR LOOKUP OPTION MACRO M1200 28-APR-83 14:05 PAGE 34-4  
TEST 3 LOOK-UP-TABLE ANALOG VERIFICATION

```

011114      040      040      040
011117      045      117      064
011122      000
1865 011123      045      101      040 NULL: .ASCIZ /%A ----/
011126      040      040      040
011131      055      055      055
011134      055      000

1866
1867
1868 011136 000000 000000 000000 .EVEN
; RECEIVED DAC CROSS-OVER POINTS.
RDAC: .WORD 0,0,0,0
011144 000000
1869 011146 000000 000000 000000 GDAC: .WORD 0,0,0,0
011154 000000
1870 011156 000000 000000 000000 BDAC: .WORD 0,0,0,0
011164 000000
1871 011166 000000 000000 000000 CDAC: .WORD 0,0,0,0
011174 000000

1872
1873 011176 000001 000002 000004 ; GAMMA ON CROSS-OVER SPECS.
RSPEC: .WORD 0001,0002,0004,0010 ; RED FIELD <3:0>.
011204 000010
1874 011206 000020 000040 000100 GSPEC: .WORD 0020,0040,0100,0200 ; GRN FIELD <7:4>.
011214 000200
1875 011216 000400 001000 002000 BSPEC: .WORD 0400,1000,2000,4000 ; BLU FIELD <11:8>.
011224 004000
1876 011226 000000 000421 001042 CSPEC: .WORD 0000,0421,1042,2104 ; CMP FIELD <11:0>.
011234 002104

1877
1878 011236 000002 000004 000010 ; GAMMA OFF CROSS-OVER SPECS.
RSPEC1: .WORD 0002,0004,0010,0013
011244 000013
1879 011246 000040 000100 000200 GSPEC1: .WORD 0040,0100,0200,0260
011254 000260
1880 011256 001000 002000 004000 BSPEC1: .WORD 1000,2000,4000,5400
011264 005400
1881 011266 000000 000421 002104 CSPEC1: .WORD 0000,0421,2104,4631
011274 004631
1882 011276
ENDTST

```

CZVSVAO COLOUR LOOKUP OPTION MACRO M1200 28-APR-83 14:05 PAGE 35  
TEST 4 BAR-DOT GENERATOR (STAND-ALONE)

```

1884
1885
1886
1887 011300
1888
1889
1890 011344 005737 002656
1891 011350 001403
1892 011352 005737 005472
1893 011356 001402
1894 011360
1895
1896
1897
1898
1899
1900
1901
1902
1903
1904
1905
1906
1907
1908
1909
1910
1911
1912
1913
1914
1915
1916
1917
1918
1919
1920 011364 004737 005422
1921 011370
1922 011410
1923 011430 004737 012022
1924 011434 012737 012306 012270
1925 011442 012737 014032 002734
1926 011450 012737 002000 002732
1927 011456 000502
1928
1929 011460 045 116 045
    011463 101 040 101
    011466 040 075 040
    011471 101 114 124
    011474 105 122 116
    011477 101 124 105
1930 011502 045 116 045
    011505 101 040 102
    011510 040 075 040
    011513 102 101 122
    011516 123
1931 011517 045 116 045

```

```

.SBTTL TEST 4 BAR-DOT GENERATOR (STAND-ALONE)
:*****
:   BEGIN.TEST <BAR-DOT GENERATOR>
:*****
:
:   TST      DPC
:   BEQ      1$      ; EXIT IF NO DPU...
:   TST      TESTK   ; ...OR NOT SELECTED ALONE.
:   BEQ      BDGEN   ; BR IF OK TO RUN.
1$:   EXIT      TST   ; OTHERWISE, EXIT.
:
:   TEST 4 IS A SPECIAL BAR-DOT-CROSSHATCH GENERATOR
:   TO BE USED FOR COLOR MONITOR CONVERGENCE SET UP.
:
:   IT WILL RUN ONLY IF SPECIFIED AS:
:   STA/TES:4 OR RES/TES:4
:   ONCE STARTED, THERE IS NO EXIT, SAVE <^C>.
:
:   ROUTINE DEFAULTS TO 8 BAR NTSC RAINBOW
:   OR GRAY-SCALE SHADES DEPENDANT ON PIXEL SIZE AS FOLLOWS:
:   2 BITS <9:8> = 4 COLORS/SHADES.
:   4 BITS <9:6> = 16 COLORS/SHADES.
:   6 BITS <9:4> = 64 COLORS/SHADES.
:   8 BITS <9:2> = 256 COLORS/SHADES.
:
:   CHANGE MODES VIA KEYBOARD:
:   A = ALTERNATE (8 COL / 16 COL / 64 COL / 256 GRAY-SCALE)
:   (OR R,G,B,W, IF 'C' OR 'D' SELECTED)
:   B = BAR GENERATOR.
:   C = 7 X 7 CROSS-HATCH.
:   D = 7 X 7 DOT ARRAY.
:   E = ENABLE GAMMA CORRECTION
:   G = GAMMA CORRECTION OFF
:   TYPE 2 <^C>'S TO RETURN TO SUPVSR COMMAND MODE.
:
BDGEN: JSR      PC,TSTGO      ; TITLE.
        PRINTF #1$          ; GIVE HIM SOME GUIDANCE...
        PRINTF #2$          ; AND A BIT MORE GUIDANCE..
        JSR      PC,BARS     ; ...AND DRAW THE COLOR BARS.
        MOV      #ALTM+20,ALIM+2 ; INIT CHANGE DISPATCHER.
        MOV      #NTSC8+2,HJE ; SET HUE AND DELAY COUNT...
        MOV      #2000,SHADLY ; ...FOR SHADING SUBROUTINE.
        BR       IDLE       ; WAIT FOR SOMETHING TO HAPPEN.
:
1$:   .ASCII  /%N%A A = ALTERNATE/
:
:   .ASCII  /%N%A B = BARS/
:
:   .ASCII  /%N%A C = CROSS-HATCH/

```

CZVSVAO COLOUR LOOKUP OPTION MACRO M1200 28-APR-83 14:05 PAGE 35-1  
TEST 4 BAR-DOT GENERATOR (STAND-ALONE)

	011522	101	040	103	
	011525	040	075	040	
	011530	103	122	117	
	011533	123	123	055	
	011536	110	101	124	
	011541	103	110		
1932	011543	045	116	045	.ASCIZ /%N% A D = DOTS/
	011546	101	040	104	
	011551	040	075	040	
	011554	104	117	124	
	011557	123	000		
1933	011561	045	116	045	2\$: .ASCII /%N% A E = ENABLE GAMMA CORRECTION/
	011564	101	040	105	
	011567	040	075	040	
	011572	105	116	101	
	011575	102	114	105	
	011600	040	107	101	
	011603	115	115	101	
	011606	040	103	117	
	011611	122	122	105	
	011614	103	124	111	
	011617	117	116		
1934	011621	045	116	045	.ASCIZ /%N% A G = GAMMA CORRECTION OFF%N2/
	011624	101	040	107	
	011627	040	075	040	
	011632	107	101	115	
	011635	115	101	040	
	011640	103	117	122	
	011643	122	105	103	
	011646	124	111	117	
	011651	116	040	117	
	011654	106	106	045	
1935	011657	116	062	000	.EVEN

CZVSVAO COLOUR LOOKUP OPTION MACRO M1200 28-APR-83 14:05 PAGE 36  
 TEST 4 BAR-DOT GENERATOR (STAND-ALONE)

```

1937
1938
1939
1940 011662 000000
1941
1942 011664
1943 011704 013700 011662
1944
1945
1946
1947 011710 120027 000003
1948 011714 001002
1949 011716
1950 011720 000776
1951
1952 011722 120027 000101
1953 011726 001002
1954 011730 004737 012170
1955 011734 120027 000102
1956 011740 001002
1957 011742 004737 012022
1958 011746 120027 000103
1959 011752 001002
1960 011754 004737 012602
1961 011760 120027 000104
1962 011764 001002
1963 011766 004737 012452
1964 011772 120027 000105
1965 011776 001002
1966 012000 004737 012774
1967 012004 120027 000107
1968 012010 001002
1969 012012 004737 013002
1970 012016 000722
1971
1972
1973 012020 015
1974 012021 000
1975

```

```

: IDLE LOOP. WAIT FOR KBD ENTRY TO CHANGE MODES.
:
INPUT: .WORD 0
:
IDLE: GMANID CHOICE,INPUT,A,377,1,1,NO
MOV INPUT,RO ; GET KB DATA IN RO
:
:
:
1$: CMPB RO,#3
BNE 2$
BREAK BR 1$ ; TAKES 2 ^C'S TO EXIT.
:
2$: CMPB RO,#'A ; <A>, XCT ALTERNATE DATA PATTERNS
BNE .+6
JSR PC,ALT
CMPB RO,#'B
BNE .+6
JSR PC,BARS ; <B>, XCT BARS.
CMPB RO,#'C
BNE .+6
JSR PC,HATCH ; <C>, XCT CROSS-HATCH.
CMPB RO,#'D
BNE .+6
JSR PC,DOTS ; <D>, XCT DOTS.
CMPB RO,#'E
BNE .+6
JSR PC,GAON ; <E>, XCT GAMMA ON
CMPB RO,#'G
BNE 3$
JSR PC,GAOFF ; <G> XCI GAMMA OFF
BR IDLE
:
3$:
:
CHOICE: .BYTE 15 ; DO CARRIAGE RETURN
.BYTE 0
.EVEN

```

CZVSVAO COLOUR LOOKUP OPTION MACRO M1200 28-APR-83 14:05 PAGE 37  
 TEST 4 BAR-DOT GENERATOR (STAND-ALONE)

```

1977
1978
1979
1980
1981 012022 005037 012772
1982 012026 004737 004712
1983 012032 012737 012306 012270
1984 012040 004737 005030
1985 012044 012737 112000 012140
1986 012052 012701 000004
1987 012056 012702 000400
1988 012062 012777 012132 170566
1989 012070 000402
1990 012072 005277 170560
1991 012076 004737 005214
1992 012102 005302
1993 012104 001411
1994 012106 060137 012140
1995 012112 042737 176000 012140
1996 012120 052737 112000 012140
1997 012126 000761
1998 012130 000207
1999
2000 012132 114000 000000 000000
2001 012140 112000
2002 012142 040000 001776
2003 012146 000002 000000
2004 012152 040000 021776
2005 012156 000002 000000
2006 012162 173000
2007 012164 160000 012140
2008
2009
2010
2011 012170 005737 012772
2012 012174 001434
2013 012176 000137
2014 012200 012202
2015 012202 012737 014376
2016 012206 012737 012216 012200
2017 012214 000421
2018 012216 012701 014316
2019 012222 012737 012232 012200
2020 012230 000413
2021 012232 012701 014336
2022 012236 012737 012246 012200
2023 012244 000405
2024 012246 012701 014356
2025 012252 012737 012202 012200
2026 012260 004737 005034
2027 012264 000207
2028 012266 000137
2029 012270 012306
2030 012272 004737 005030
2031 012276 012737 012306 012270
2032 012304 000207
2033 012306 004737 005042

: COLOR BAR GENERATOR.
: NUMBER AND COLOR OF BARS DEPENDANT ON PIXEL SIZE.
:
BARS: CLR CD ; CLEAR CROSS/DOTS FLAG
      JSR PC,CLRRW ; INIT DISPLAY.
      MOV #ALTM+20,ALTM+2 ; GET SEQUENCE RIGHT
      JSR PC,NTSC ; NTSC COLORS
      MOV #LVEC!LO,BV ; INIT DISPLAY CODE AT LVL 0...
      MOV #4,R1 ; ...AND INCREMENT BY LVL 1.
1$: MOV #256.,R2 ; 256 PAIRS = 512 TOTAL.
   MOV #BGEN,@DPC
   SKP2
2$: INC @DPC
   JSR PC,WAITF
   DEC R2
   BEQ 3$ ; BR WHEN FINISHED.
   ADD R1,BV ; OTHERWISE, INCREMENT...
   BIC #^C1777,BV ; ...AND STRIP THE LEVEL...
   BIS #LVEC!LO,BV ; ...AND REPLACE OPCODE.
   BR 2$ ; ...AND LOOP.
3$: RTS PC ; RETURN TO IDLE LOOP.

BGEN: APNT, 0, 0
BV: LVEC!LO
   I!O, MAXY ; UP...
   2, 0 ; ...AND OVER...
   I!O, MXY!MAXY ; ...DOWN...
   2, 0 ; ...AND OVER AGAIN.
   STOPN
   DJMP, BV

: ON <ALT>, CHANGE THE COLOR PATTERNS IN THE LUT.
:
ALT: TST CD ; CROSS-HATCH OR DOTS ?
     BEQ ALTM ; IF NOT JUMP
ALT1: JMP @PC)+ ; ELSE, GET NEXT COLOR
     1$
1$: MOV #WT,R1 ; MAKE IT WHITE
   MOV #2$,ALT1+2 ; GREEN NEXT TIME ROUND
   BR 5$
2$: MOV #RD,R1 ; MAKE IT RED
   MOV #3$,ALT1+2 ; BLUE NEXT
   BR 5$
3$: MOV #GN,R1 ; MAKE IT GREEN
   MOV #4$,ALT1+2 ; WHITE NEXT
   BR 5$
4$: MOV #BL,P1 ; MAKE IT BLUE
   MOV #1$,ALT1+2 ; BACK TO WHITE NEXT
5$: JSR PC,NTSC+4 ; GO SET UP THE LUT
   RTS PC ; GO BACK TO IDLE
   JMP @PC)+ ; DISPATCH.
2$: JSR PC,NTSC ; 8 STANDARD COLORS.
   MOV #2$,ALTM+2 ; CHANGE DISPATCH.
   RTS PC
2$: JSR PC,CL16 ; 16 COLORS.

```

CZVSVAO COLOUR LOOKUP OPTION MACRO M1200 28-APR-83 14:05 PAGE 37-1  
 TEST 4 BAR-DOT GENERATOR (STAND-ALONE)

2034	012312	012737	012322	012270		MOV	#3\$,ALTM+2		
2035	012320	000207				RTS	PC		
2036	012322	004737	005054		3\$:	JSR	PC,CL64	:	64 COLORS
2037	012326	012737	012336	012270		MOV	#4\$,ALTM+2	:	
2038	012334	000207				RTS	PC	:	
2039	012336	004737	005016		4\$:	JSR	PC,LUMIN	:	256 LEVEL GRAY-SCALE.
2040	012342	012737	012352	012270		MOV	#5\$,ALTM+2		
2041	012350	000207				RTS	PC		
2042	012352	013700	002734		5\$:	MOV	HUE,R0	:	GET POINTER.
2043	012356	012001				MOV	(R0)+,R1	:	GET 1ST/NEXT COLOR.
2044	012360	100405				BMI	6\$	:	RESET IF END-OF-LIST.
2045	012362	010037	002734			MOV	R0,HUE	:	OTHERWISE, SAVE POINTER...
2046	012366	004737	005132			JSR	PC,SHAD16	:	...DO 16 SHADES THIS COLOR.
2047	012372	000207				RTS	PC		
2048	012374	012737	014032	002734	6\$:	MOV	#NTSC8+2,HUE	:	RESET HUE POINTER.
2049	012402	012737	012272	012270		MOV	#1\$,ALTM+2	:	RESET DISPATCHER.
2050	012410	000726				BR	ALTM	:	AND GO 'ROUND.

CZVSVAO COLOUR LOOKUP OPTION MACRO M1200 28-APR-83 14:05 PAGE 38  
 TEST 4 BAR-DOT GENERATOR (STAND-ALONE)

```

2052
2053      ; 7 X 7 POINT TABLE FOR DOTS AND CROSS-HATCH.
2054
2055      XTBL:
2056      Y50TBL: 34.*2      ; X POINTS...
2057      108.*2           ; ...AND 50 HZ Y POINTS.
2058      182.*2           ; DELTA = 74.
2059      256.*2
2060      330.*2
2061      404.*2
2062      478.*2
2063      -1
2064      Y60TBL: 36.*2      ; 60 HZ Y POINTS.
2065      104.*2           ; DELTA = 68.
2066      172.*2
2067      240.*2
2068      308.*2
2069      376.*2
2070      444.*2
2071      -1
2072
2073      ; DOT GENERATOR.
2074
2075      DOTS:  INC      CD      ; SET CD FLAG
2076      JSR      PC,CLRRW    ; INIT DISPLAY.
2077      MOV      #ALT1+4,ALT1+2 ; FIRST COLOR ALWAYS WHITE
2078      JSR      PC,ALT      ; SET UP COLOR
2079      MOV      #Y60TBL,R2   ; ASSUME 60 HZ Y'S.
2080      CMP      HZ,#60.
2081      BEQ      1$
2082      MOV      #Y50TBL,R2   ; WRONG, USE 50 HZ Y'S.
2083
2084      1$:      MOV      (R2)+,DGY ; SET Y POINT.
2085      BMI      3$          ; BR WHEN ALL DOTS DONE.
2086      MOV      #XTBL,R1
2087      2$:      MOV      (R1)+,DGX ; SET X POINT.
2088      BMI      1$          ; X DONE, GET NEXT Y.
2089      BIS      #I,DGX       ; SET I BIT.
2090      MOV      #DGEN,@DPC
2091      JSR      PC,WAITF
2092      BR       2$
2093      3$:      RTS      PC      ; LOOP
2094      ; RETURN.
2095      DGEN:    APNT:ALL
2096      DGX:     I:0
2097      DGY:     0
2098      STOPN
2099      RPNT
2100      SXY     1,2,0
2101      SXY     1,0,2
2102      SXY     1,-2,0
2103      STOPN
    
```

CZVSVAO COLOUR LOOKUP OPTION MACRO M1200 28-APR-83 14:05 PAGE 39  
 TEST 4 BAR-DOT GENERATOR (STAND-ALONE)

```

2105
2106      : CROSS-HATCH GENERATOR.
2107
2108 012602 005237 012772      HATCH: INC      CD      : SET CD FLAG
2109 012606 004737 004712      JSR      PC,CLRRW  : INIT DISPLAY.
2110 012612 012737 012202 012200  MOV      #ALT1+4,ALT1+2 : FIRST COLOR ALWAYS WHITE
2111 012620 004737 012170      JSR      PC,ALT    : SET UP COLOR
2112 012624 005037 012756      CLR      CHX
2113 012630 012737 041776 012764  MOV      #I!MAXX,CHV  : SET FOR HORIZ VECTORS.
2114 012636 005037 012766      CLR      CHV+2
2115 012642 012701 012432      MOV      #Y60TBL,R1  : ASSUME 60 HZ Y'S.
2116 012646 023727 005650 000074  CMP      HZ,#60.
2117 012654 001402      BEQ      1$
2118 012656 012701 012412      MOV      #Y50TBL,R1  : WRONG AGAIN.
2119
2120 012662 012137 012760      1$:  MOV      (R1)+,CHY  : SET NEXT Y.
2121 012666 100406      BMI      2$      : BR AT END OF Y'S.
2122 012670 012777 012754 167760  MOV      #HGEN,@DPC
2123 012676 004737 005214      JSR      PC,WAITF
2124 012702 000767      BR      1$      : LOOP FOR 7 HORIZ VECTORS.
2125
2126 012704 005037 012760      2$:  CLR      CHY
2127 012710 012737 040000 012764  MOV      #I!0,CHV    : SET FOR VERT VECTORS.
2128 012716 012737 001776 012766  MOV      #MAXY,CHV+2
2129 012724 012701 012412      MOV      #XTBL,R1
2130 012730 012137 012756      3$:  MOV      (R1)+,CHX  : SET NEXT X.
2131 012734 100406      BMI      4$      : BR AT END OF X'S.
2132 012736 012777 012754 167712  MOV      #HGEN,@DPC
2133 012744 004737 005214      JSR      PC,WAITF
2134 012750 000767      BR      3$
2135 012752 000207      4$:  RTS      PC      : LOOP FOR 7 VERT VECTORS.
2136      : RETURN.
2137 012754 114000      HGEN:  APNT
2138 012756 000000      CHX:   0
2139 012760 000000      CHY:   0
2140 012762 112377      LVEC!ALL
2141 012764 041776 000000      CHV:   I!MAXX,0
2142 012770 173000      STOPN
2143
2144 012772 000000      CD:    0      : SET FOR CROSS-HATCH OR DOTS
2145
2146 012774 005077 167672      GAON:  CLR      @LMR  : SET GAMMA ON
2147 013000 000207      RTS      PC
2148
2149
2150 013002 052777 000100 167662  GAOFF:  BIS      #GCOFF,@LMR : SET GAMMA OFF
2151 013010 000207      RTS      PC
2152
2153
2154
2155 013012      ENDTST
    
```

2157  
2158  
2159  
- 160  
2161  
2162  
2163  
2164  
2165 013014

.SBTTL  
.SBTTL SUPERVISORS DISPATCH TABLE  
  
:++  
: THIS TABLE HOLDS THE STARTING ADDRESS OF EACH TEST  
: FOR THE SUPERVISOR'S DISPATCHER.  
:--  
  
DISPATCH            TSTESTNUM

CZVSVAO COLOUR LOOKUP OPTION MACRO M1200 28-APR-83 14:05 PAGE 41  
 \*\*\* LUMINANCE (GREY-SCALE) AND COLOR DATA TABLES

Line	Code	Color	Color	Color	Color	Color	Color	Color
2167								
2168								
2169								
2170								
2171								
2172	013026							
2173	013026	000000	000400	001000	0.	400.	1000.	1
	013034	000001						
2174	013036	001400	000401	002000	1400.	401.	2000.	1001
	013044	001001						
2175	013046	002400	000020	000420	2400.	20.	420.	1020
	013054	001020						
2176	013056	000021	001420	000421	21.	1420.	421.	2020
	013064	002020						
2177	013066	001021	002420	00040	1021.	2420.	40.	440
	013074	000440						
2178	013076	001040	000041	001440	1040.	41.	1440.	441
	013104	000441						
2179	013106	002040	001041	002440	2040.	1041.	2440.	42
	013114	000042						
2180	013116	001441	000460	001060	1441.	460.	1060.	61
	013124	000061						
2181	013126	001460	000461	002060	1460.	461.	2060.	1061
	013134	001061						
2182	013136	002460	000062	001461	2460.	62.	1461.	462
	013144	000462						
2183	013146	001062	000063	001462	1062.	63.	1462.	463
	013154	000463						
2184	013156	002062	001063	002462	2062.	1063.	2462.	1501
	013164	001501						
2185	013166	000502	002101	001102	502.	2101.	1102.	2502
	013174	002502						
2186	013176	001502	003101	000503	1502.	3101.	503.	2102
	013204	002102						
2187	013206	001121	000122	001521	1121.	122.	1521.	522
	013214	000522						
2188	013216	001122	000123	001522	1122.	123.	1522.	523
	013224	000523						
2189	013226	002122	001123	002522	2122.	1123.	2522.	142
	013234	000142						
2190	013236	001541	000542	001142	1541.	542.	1142.	143
	013244	000143						
2191	013246	001542	000543	002142	1542.	543.	2142.	1143
	013254	001143						
2192	013256	002542	001543	000562	2542.	1543.	562.	2161
	013264	002161						
2193	013266	001162	002561	001562	1162.	2561.	1562.	563
	013274	000563						
2194	013276	002162	001163	002562	2162.	1163.	2562.	1163
	013304	001163						
2195	013306	000564	002201	001202	564.	2201.	1202.	2601
	013314	002601						
2196	013316	001602	003201	000603	1602.	3201.	603.	2202
	013324	002202						
2197	013326	001203	002602	001603	1203.	2602.	1603.	3202
	013334	003202						
2198	013336	002221	001222	002621	2221.	1222.	2621.	1622

CZVSVAO COLOUR LOOKUP OPTION MACRO M1200 28-APR-83 14:05 PAGE 41-1  
 \*\*\* LUMINANCE (GREY-SCALE) AND COLOR DATA TABLES

2199	013344	001622						
	013346	003221	000623	002222	3221.	623.	2222.	1223
	013354	001223						
2200	013356	002622	001623	000624	2622.	1623.	624.	2241
	013364	002241						
2201	013365	001242	002641	001642	1242.	2641.	1642.	3241
	013374	003241						
2202	013376	000643	002242	001243	643.	2242.	1243.	2642
	013404	002642						
2203	013406	001643	003242	002261	1643.	3242.	2261.	1262
	013414	001262						
2204	013416	002661	001662	003261	2661.	1662.	3261.	663
	013424	000663						
2205	013426	002262	001263	002662	2262.	1263.	2662.	1663
	013434	001663						
2206	013436	003262	002301	001302	3262.	2301.	1302.	2702
	013444	002702						
2207	013446	001702	003301	000703	1702.	3301.	703.	2302
	013454	002302						
2208	013456	001303	002702	001703	1303.	2702.	1703.	3302
	013464	003302						
2209	013466	002321	001322	002721	2321.	1322.	2721.	1722
	013474	001722						
2210	013476	003321	000723	002322	3321.	723.	2322.	1323
	013504	001323						
2211	013506	002722	001723	003322	2722.	1723.	3322.	2341
	013514	002341						
2212	013516	001342	002741	001742	1342.	2741.	1742.	3341
	013524	003341						
2213	013526	000743	002342	001343	743.	2342.	1343.	2742
	013534	002742						
2214	013536	001743	003342	002361	1743.	3342.	2361.	1362
	013544	001362						
2215	013546	002761	001762	003361	2761.	1762.	3361.	763
	013554	000763						
2216	013556	002362	001363	002762	2362.	1363.	2762.	1763
	013564	001763						
2217	013566	003362	002363	001364	3362.	2363.	1364.	2763
	013574	002763						
2218	013576	001764	003363	002364	1764.	3363.	2364.	1365
	013604	001365						
2219	013606	002764	001765	003364	2764.	1765.	3364.	2365
	013614	002365						
2220	013616	001366	002765	001766	1366.	2765.	1766.	3365
	013624	003365						
2221	013626	002366	001367	002766	2366.	1367.	2766.	1767
	013634	001767						
2222	013636	003366	002367	003766	3366.	2367.	3766.	2767
	013644	002767						
2223	013646	004366	003367	002370	4366.	3367.	2370.	3767
	013654	003767						
2224	013656	002770	004367	005766	2770.	4367.	5766.	4767
	013664	004767						
2225	013666	003770	005367	004370	3770.	5367.	4370.	5767
	013674	005767						
2226	013676	004770	003771	005370	4770.	3771.	5370.	4371
	013704	004371						

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 \*\*\* LUMINANCE (GREY-SCALE) AND COLOR DATA TABLES

2227	013706	005770	004771	003772	5770.	4771.	3772.	2773
	013714	002773						
2228	013716	004372	003373	004772	4372.	3373.	4772.	3773
	013724	003773						
2229	013726	005372	004373	005772	5372.	4373.	5772.	4773
	013734	004773						
2230	013736	006372	005373	006772	6372.	5373.	6772.	5773
	013744	005773						
2231	013746	004774	006373	005374	4774.	6373.	5374.	6773
	013754	006773						
2232	013756	005774	007373	006374	5774.	7373.	6374.	5375
	013764	005375						
2233	013766	006774	005775	007374	6774.	5775.	7374.	6375
	013774	006375						
2234	013776	005376	006775	005776	5376.	6775.	5776.	7375
	014004	007375						
2235	014006	006376	007375	006376	6376.	7375.	6376.	6776
	014014	006776						
2236	014016	007376	006777	007377	7376.	6777.	7377.	7777
	014024	007777						
2237	014026	177777						

: TERMINATE LIST

2238  
2239  
2240  
2241 002400  
2242 000005  
2243 000120  
2244 005000  
2245 000012  
2246 000240  
2247 007400  
2248 000017  
2249 000360  
2250  
2251  
2252

-1  
:  
:  
:  
:  
LBLU= 2400  
LRED= 5  
LGRN= 120  
MBLU= 5000  
MRED= 12  
MGRN= 240  
BLU= 7400  
RED= 17  
GRN= 360  
:  
:

: THE BASIC (NTSC) COLORS, PLUS BLACK AND WHITE.

2253  
2254 014030 000000  
2255 014032 007400  
2256 014034 000017  
2257 014036 007417  
2258 014040 000360  
2259 014042 007760  
2260 014044 000377  
2261 014046 007777  
2262 014050 177777

NTSC8: 0 ; BLACK (NO COLOR AT ALL).  
BLU  
RED  
RED+BLU ; MAGENTA  
GRN  
GRN+BLU ; CYAN  
GRN+RED ; YELLOW  
GRN+RED+BLU ; WHITE  
-1 ; TERMINATE LIST.

2263  
2264  
2265  
2266 014052 000000  
2267 014054 000005  
2268 014056 000017  
2269 014060 000137  
2270 014062 000257  
2271 014064 000377  
2272 014066 000372  
2273 014070 000360

:  
:  
: A 16 COLOUR RAINBOW  
:  
COL16: 0  
LRED  
RED  
RED+LGRN  
RED+MGRN  
RED+GRN  
MRED+GRN  
GRN

CZVSVAO COLOUR LOOKUP OPTION MACRO M1200 28-APR-83 14:05 PAGE 41-3  
 \*\*\* LUMINANCE (GREY-SCALE) AND COLOR DATA TABLES

2274	014072	002640	MGRN+LBLU
2275	014074	005365	MBLU+LRED+GRN
2276	014076	007640	MGRN+BLU
2277	014100	007400	BLU
2278	014102	007412	BLU+MRED
2279	014104	007417	BLU+RED
2280	014106	007657	BLU+RED+MGRN
2281	014110	007777	BLU+RED+GRN
2282	014112	177777	-1

; TERMINATE LIST

2283  
2284  
2285  
2286  
2287

.....  
64 COLOURS TO FEAST YOUR EYES ON

2288	014114	000000	COL64: 0
2289	014116	000005	LRED
2290	014120	002412	MRED+LBLU
2291	014122	000012	MRED
2292	014124	000017	RED
2293	014126	002532	MRED+LGRN+LBLU
2294	014130	002537	RED+LGRN+LBLU
2295	014132	000132	MRED+LGRN
2296	014134	000137	RED+LGRN
2297	014136	002417	RED+LBLU
2298	014140	005012	MRED+MBLU
2299	014142	005132	MRED+LGRN+MBLU
2300	014144	005017	RED+MBLU
2301	014146	005137	RED+LGRN+MBLU
2302	014150	007417	RED+BLU
2303	014152	007537	RED+LGRN+BLU
2304	014154	002657	RED+MGRN+LBLU
2305	014156	005257	RED+MGRN+MBLU
2306	014160	007657	RED+MGRN+BLU
2307	014162	002400	LBLU
2308	014164	002405	LRED+LBLU
2309	014166	002520	LGRN+LBLU
2310	014170	005000	MBLU
2311	014172	005120	LGRN+MBLU
2312	014174	005005	LRED+MBLU
2313	014176	005125	LRED+LGRN+MBLU
2314	014200	005240	MGRN+MBLU
2315	014202	005245	LRED+MGRN+MBLU
2316	014204	007525	LRED+LGRN+BLU
2317	014206	007532	MRED+LGRN+BLU
2318	014210	007412	MRED+BLU
2319	014212	007645	LRED+MGRN+BLU
2320	014214	007652	MRED+MGRN+BLU
2321	014216	007405	LRED+BLU
2322	014220	007400	BLU
2323	014222	007520	LGRN+BLU
2324	014224	007640	MGRN+BLU
2325	014226	007760	GRN+BLU
2326	014230	007765	LRED+GRN+BLU
2327	014232	007772	MRED+GRN+BLU
2328	014234	000120	LGRN
2329	014236	000125	LRED+LGRN
2330	014240	002640	MGRN+LBLU

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\*\*\* LUMINANCE (GREY-SCALE) AND COLOR DATA TABLES

2331	014242	002645	LRED+MGRN+LBLU
2332	014244	002652	MRED+MGRN+LBLU
2333	014246	000252	MRED+MGRN
2334	014250	000257	RED+MGRN
2335	014252	000245	LRED+MGRN
2336	014254	000240	MGRN
2337	014256	000360	GRN
2338	014260	000365	LRED+GRN
2339	014262	002760	GRN+LBLU
2340	014264	002765	LRED+GRN+LBLU
2341	014266	002772	MRED+GRN+LBLU
2342	014270	000372	MRED+GRN
2343	014272	005372	MRED+GRN+MBLU
2344	014274	005360	GRN+MBLU
2345	014276	005365	LRED+GRN+MBLU
2346	014300	000377	RED+GRN
2347	014302	002777	RED+GRN+LBLU
2348	014304	005377	RED+GRN+MBLU
2349	014306	002525	LRED+LGRN+LBLU
2350	014310	005252	MRED+MGRN+MBLU
2351	014312	007777	RED+GRN+BLU
2352	014314	177777	-1

; TERMINATE LIST

2353			
2354			
2355	014316	000000	RD: 0
2356	014320	000017	RED
2357	014322	000017	RED
2358	014324	000017	RED
2359	014326	000017	RED
2360	014330	000017	RED
2361	014332	000017	RED
2362	014334	000017	RED
2363			
2364			
2365	014336	000000	GN: 0
2366	014340	000360	GRN
2367	014342	000360	GRN
2368	014344	000360	GRN
2369	014346	000360	GRN
2370	014350	000360	GRN
2371	014352	000360	GRN
2372	014354	000360	GRN
2373			
2374			
2375	014356	000000	BL: 0
2376	014360	007400	BLU
2377	014362	007400	BLU
2378	014364	007400	BLU
2379	014366	007400	BLU
2380	014370	007400	BLU
2381	014372	007400	BLU
2382	014374	007400	BLU
2383			
2384			

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\*\*\* LUMINANCE (GREY-SCALE) AND COLOR DATA TABLES

2386 014376 000000  
2387 014400 007777  
2388 014402 007777  
2389 014404 007777  
2390 014406 007777  
2391 014410 007777  
2392 014412 007777  
2393 014414 007777  
2394 014416 177777  
2395  
2396  
2397  
2398  
2399  
2400  
2401  
2402  
2403  
2404  
2405 014420  
2406  
2407 015000 015000  
2408 015000 015004  
2409  
2410  
2411 000001

WT: 0  
7777  
7777  
7777  
7777  
7777  
7777  
7777  
-1 ; TERMINATE LIST  
.SBTTL \*\*\* PATCH AREA  
.SBTTL  
:  
: FINALLY A GENEROUS PATCH AREA.  
:  
: AND AN ADJUSTMENT TO ACCOUNT FOR THE 'LASTAD BIT7' HACK  
: DESCRIBED IN 'SUPPRG.MEM' (FOR REV C).  
:  
PATCH: .BLKB <<. +400>8^C377>-.  
:  
: LASTAD ;SET LAST USED ADDRESS.  
L\$LAST::  
.SBTTL \*\*\*\*\* TH - TH - TH - TH - THAT'S ALL FOLKS ! \*\*\*\*\*  
.END

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SYMBOL TABLE

ADR = 000020 G	CHX 012756	C\$INIT= 000011	ENVIRN 005554	GRNSUM 010562
ALL = 002377 G	CHY 012760	C\$INLP= 000020	ERRBLK 003230 G	GRN1 010020
ALT 012170	CHO = 000000 G	C\$MANI= 000050	ERRK 005532	GSPEC 011206
ALTM 012266	CH1 = 000400 G	C\$MEM = 000031	ERRMSG 003226 G	GSPEC1 011246
ALT1 012176	CH2 = 001000 G	C\$MESSG = 000023	ERRNBR 003224 G	GXI = 174100 G
APNT = 114000 G	CH3 = 001400 G	C\$OPEN= 000034	ERRTYP 003222 G	GYI = 174100 G
ASSEMB= 000010	CLRMEM= 170140 G	C\$PNTB= 000014	ESUM 005534	G\$CNTO= 000200
BARS 012022	CLRRW 004712	C\$PNTF= 000017	EVL = 000004 G	G\$DELM= 000372
BDAC 011156	CLRW 004702	C\$PNTS= 000016	EXP 011047	G\$DISP= 000003
BDERR 004271	CL16 005042	C\$PNTX= 000015	EXSM2 = 000050 G	G\$EXCP= 000400
BDGEN 011364	CL64 005054	C\$QIO = 000377	EXSM4 = 000060 G	G\$HILI= 000002
BGEN 012132	CMPSUM 010606	C\$RDBU= 000007	EXTA 003234	G\$LOLI= 000001
BIT0 = 000001 G	CMP1 010134	C\$REFG= 000047	EXTEND 003232	G\$NO = 000000
BIT00 = 000001 G	CNTNU 006272	C\$RESE= 000033	EX2 = 000010 G	G\$OFFS= 000400
BIT01 = 000002 G	COL16 014052	C\$RFVI= 000003	EX4 = 000020 G	G\$OFFSI= 000376
BIT02 = 000004 G	COL64 014114	C\$RFLA= 000021	ESEND = 002100	G\$PRMA= 000001
BIT03 = 000010 G	CSPEC 011226	C\$RPT = 000025	ESLOAD= 000035	G\$PRMD= 000002
BIT04 = 000020 G	CSPEC1 011266	C\$SEFG= 000046	FLAGS 002726	G\$PRML= 000000
BIT05 = 000040 G	CUIM = 146016 G	C\$SPRI= 000041	FREE 005644	G\$RADA= 000140
BIT06 = 000100 G	CUIOFF= 146012 G	C\$SVEC= 000037	FRESIZ 005646	G\$RADB= 000000
BIT07 = 000200 G	CUIS = 146013 G	C\$TPRI= 000013	FSAU = 000015	G\$RADD= 000040
BIT08 = 000400 G	CUOFF = 146040 G	DACERR 003120 G	FSAUTO= 000020	G\$RADL= 000120
BIT09 = 001000 G	CUON = 146060 G	DACGC 004500	F\$BGN = 000040	G\$RADO= 000020
BIT1 = 000002 G	CURD = 146100 G	DACX 004552	F\$CLEA= 000007	G\$XFER= 000004
BIT10 = 002000 G	CVC = 000040 G	DACX1 004340	F\$DU = 000016	G\$YES = 000010
BIT11 = 004000 G	C\$AU = 000052	DACX2 004421	F\$END = 000041	HAFX = 000776 G
BIT12 = 010000 G	C\$AUTO= 000061	DATA 011111	F\$HARD= 000004	HAFY = 000776 G
BIT13 = 020000 G	C\$BRK = 000022	DEADU 006330	F\$HW = 000013	HAFY50= 000776 G
BIT14 = 040000 G	C\$BSEG= 000004	DFPTBL 002222 G	F\$INIT= 000006	HAFY60= 000736 G
BIT15 = 100000 G	C\$BSUB= 000002	DGEN 012560	F\$JMP = 000050	HATCH 012602
BIT2 = 000004 G	C\$CEFG= 000045	DGX 012562	F\$MOD = 000000	HCOPI = 176051 G
BIT3 = 000010 G	C\$CLCK= 000062	DGY 012564	F\$MSG = 000011	HCPY = 000001 G
BIT4 = 000020 G	C\$CLEA= 000012	DIAGMC= 000000	F\$PROT= 000021	HGEN 012754
BIT5 = 000040 G	C\$CLOS= 000035	DJM 004610	F\$PWR = 000017	HOE = 100000 G
BIT6 = 000100 G	C\$CLP1= 000006	DJMP = 160000 G	F\$RPT = 000012	HST = 040000 G
BIT7 = 000200 G	C\$CVEC= 000036	DJS 004614	F\$SEG = 000003	HUE 002734 G
BIT8 = 000400 G	C\$DCLN= 000044	DNOP = 164000 G	F\$SOFT= 000005	HZ 005650
BIT9 = 001000 G	C\$DODU= 000051	DOTS 012452	F\$SRV = 000010	I = 040000 G
BL 014356	C\$DRPT= 000024	DO4 010676	F\$SUB = 000002	IBE = 010000 G
BLU = 007400	C\$DU = 000053	DPC 002656 G	F\$SW = 000014	IDLE 011664
BLUC = 000004 G	C\$EDIT= 000003	DPOP = 165000 G	F\$TEST= 000001	IDPC 002710 G
BLUSUM 010574	C\$ERDF= 000055	DPRI 002674 G	GAMMA 010512	IDSQ 002712 G
BLU1 010066	C\$ERHR= 000056	DPUSAV 004620	GAOFF 013002	IDU = 000040 G
BM04 = 134000 G	C\$ERRO= 000060	DSR 002660 G	GAON 012774	IDXR 002714 G
BM08 = 135000 G	C\$ERSF= 000054	DSTP 004604	GCBIT 010544	IDYR 002716 G
BM14 = 136000 G	C\$ERSO= 000057	DTO 004556	GCOFF = 000100 G	IER = 020000 G
BM18 = 137000 G	C\$ESCA= 000010	DX = 000002 G	GCX 004554	ILDR 002722 G
BOE = 000400 G	C\$ESEG= 000005	DXR 002662 G	GDAC 011146	ILMR 002724 G
BSPEC 011216	C\$ESUB= 000003	DYI = 000002 G	GDERR 004247	ILSR 002720 G
BSPEC1 011256	C\$ETST= 000001	DYNI = 000004 G	GHX = 120000 G	INPUT 011662
BV 012140	C\$EXIT= 000032	DYR 002664 G	GHY = 124000 G	ISR = 000100 G
CD 012772	C\$GETB= 000026	EF.CON= 000036 G	GN 014336	IXE = 004000 G
CDAC 011166	C\$GETW= 000027	EF.NEW= 000035 G	GOFF 004545	ISAU = 000041
CDERR 004312	C\$GMAN= 000043	EF.PWR= 000034 G	GON 004540	ISAUTO= 000041
CHAR = 100000 G	C\$GPHR= 000042	EF.RES= 000037 G	GONOGO 010352	ISCLN = 000041
CHOICE 012020	C\$GPLO= 000030	EF.STA= 000040 G	GRN = 000360	ISDU = 000041
CHV 012764	C\$GPRI= 000040	EN = 000620	GRNC = 000010 G	ISHRD = 000041

CZVSAO COLOUR LOOKUP OPTION MACRO M1200 28-APR-83 14:05 PAGE 42-2  
 SYMBOL TABLE

I\$INIT=	000041	L\$AUT	002070	G	L10005	003026	O\$AU	=	000001	STOPN	=	173000	G	
I\$MOD	=	000041	L\$AUTO	006324	G	L10006	003060	O\$BGNR	=	000000	STPV	=	002676	G
I\$MSG	=	000040	L\$CCP	002106	G	L10007	003116	O\$BGNS	=	000001	SVCGBL	=	000000	
I\$PROT	=	000040	L\$CLEA	006504	G	L10010	003170	O\$DU	=	000001	SVCINS	=	177777	
I\$PTAB	=	000041	L\$CO	002032	G	L10012	006314	O\$ERRT	=	000001	SVCSUB	=	177777	
I\$PWR	=	000041	L\$DEPO	002011	G	L10014	006324	O\$GNSW	=	000001	SVCTAG	=	177777	
I\$RPT	=	000041	L\$DESC	002122	G	L10015	006420	O\$POIN	=	000001	SVCTST	=	177777	
I\$SEG	=	000041	L\$DESP	002076	G	L10016	006502	O\$SETU	=	000000	SVEC	=	104000	G
I\$SETU	=	000041	L\$DEVP	002060	G	L10017	006526	PATCH	=	014420	SWE	=	000010	G
I\$SFT	=	000041	L\$DISP	013016	G	L10020	006530	PAUSE1	=	005254	SWTCH	=	170200	G
I\$SRV	=	000041	L\$DLY	002116	G	L10021	007430	PAUS.5	=	005262	SYNC	=	164001	G
I\$SUB	=	000041	L\$DTP	002040	G	L10022	007166	PAU.01	=	005270	S\$LSYM	=	010000	
I\$TST	=	000041	L\$DTYP	002034	G	L10023	007320	PNT	=	001000	TEMP1	=	002736	G
J\$MV	=	002700	L\$DU	006326	G	L10024	007416	PRI	=	002000	TEMP2	=	002740	G
J\$SV	=	002704	L\$DUT	002072	G	L10025	007604	PRI00	=	000000	TEMP3	=	002742	G
J\$0	=	000000	L\$DVTY	002156	G	L10026	011276	PRI01	=	000040	TESTK	=	005472	
J\$1	=	000400	L\$EF	002052	G	L10027	013012	PRI02	=	000100	THRSH	=	010766	
J\$2	=	001000	L\$ENVI	002044	G	L255	=	002377	G	PRI03	=	000140	G	
J\$3	=	001400	L\$ERRT	003222	G	MAIER	=	004102	G	PRI04	=	000200	G	
J\$JMP	=	000167	L\$ETP	002102	G	MAINT	=	007502	G	PRI05	=	000240	G	
K100US	=	005322	L\$EXP1	002046	G	MAXX	=	001776	G	PRI06	=	000300	G	
LAIER	=	003677	L\$EXP4	002064	G	MAXY	=	001776	G	PRI07	=	000340	G	
LAIEW	=	003741	L\$EXP5	002066	G	MAXY50	=	001776	G	PROTEC	=	176000	G	
LBLU	=	002400	L\$SHARD	002236	G	MAXY60	=	001676	G	QVP	=	002654	G	
LDI	=	002000	L\$HIME	002120	G	MBLU	=	005000	G	RD	=	014316	G	
LDINC	=	004004	L\$HPCP	002016	G	MDV0	=	000000	G	RDAC	=	011136	G	
LDR	=	002670	L\$HPTP	002022	G	MDV1	=	000001	G	RDERR	=	004227	G	
LDUN	=	004652	L\$HW	002222	G	MDV2	=	000002	G	RDWRT	=	176074	G	
LGRN	=	000120	L\$ICP	002104	G	MDV3	=	000003	G	RDWRT1	=	176076	G	
LINTER	=	003030	L\$INIT	005652	G	MGRN	=	000240	G	READ	=	176050	G	
LINTX	=	003662	L\$LADP	002026	G	MRED	=	000012	G	REC	=	011070	G	
LMER	=	004151	L\$LAST	015004	G	MRWERR	=	003172	G	RED	=	000017	G	
LMR	=	002672	L\$LOAD	002100	G	MSX	=	020000	G	REDC	=	000020	G	
LOE	=	040000	L\$LUN	002074	G	MSY	=	000100	G	REDSUM	=	010550	G	
LOOP	=	005374	L\$MREV	002050	G	MXY	=	020000	G	RED1	=	007752	G	
LOOPK	=	005420	L\$NAME	002000	G	M1	=	002312	G	RELEAS	=	004766	G	
LOT	=	000010	L\$PRIO	002042	G	M128	=	000002	G	RPNT	=	130000	G	
LREAD	=	010000	L\$PROT	006316	G	M2	=	002345	G	RSPEC	=	011176	G	
LREG	=	000005	L\$PRT	002112	G	M256	=	000003	G	RSPEC1	=	011236	G	
LRWERR	=	003062	L\$REPP	002062	G	M3	=	002401	G	R256	=	000100	G	
LRWX	=	004031	L\$REV	002010	G	M32	=	000000	G	SETCB	=	152000	G	
LSET	=	010000	L\$RPT	006530	G	M4	=	002426	G	SETHB	=	150000	G	
LSR	=	002666	L\$SOFT	002522	G	M5	=	002461	G	SETMEM	=	170100	G	
LUMIN	=	005016	L\$SPC	002056	G	M64	=	000001	G	SETRR	=	000014	G	
LUMTBL	=	013026	L\$SPCP	002020	G	NEWPAS	=	005736	G	SFPTBL	=	002516	G	
LUTAI	=	007022	L\$SPTP	002024	G	NLRI	=	003430	G	SHADLY	=	002732	G	
LUTAV	=	002730	L\$STA	002030	G	NLWI	=	003504	G	SHAD16	=	005132	G	
LUTCLR	=	007172	L\$SW	002516	G	NTSC	=	005030	G	SIOFF	=	171000	G	
LUTGAV	=	007702	L\$TEST	002114	G	NTSC8	=	014030	G	SION	=	171400	G	
LUTGSD	=	007324	L\$TIML	002014	G	NULL	=	011123	G	SKP0	=	000400	G	
LUTSAV	=	004656	L\$UNIT	002012	G	NXM	=	005324	G	SKP1	=	000401	G	
LUTTST	=	006570	LO	=	002000	NXR	=	003350	G	SKP2	=	000402	G	
LUTV	=	002706	L10000	=	002234	NXRERR	=	003000	G	SKP3	=	000403	G	
LVEC	=	110000	L10001	=	002514	NXR	=	003407	G	SM1	=	002532	G	
LSACP	=	002110	L10002	=	002520	NXTU	=	005750	G	START	=	005716	G	
LSAPT	=	002036	L10003	=	002652	ONEFIL	=	000001	G	STOP	=	172000	G	
L\$AU	=	006422	L10004	=	002776	O\$APTS	=	000000	G	STOPI	=	173400	G	

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SYMBOL TABLE

T\$\$MSG= 010011	T1.1	007020	ULRI	003561	WAITF	005214	X\$OFFS= 000400
T\$\$PRO= 010013	T1.2	007170	ULWI	003621	WRT =	176034 G	X\$TRUE= 000020
T\$\$RPT= 010020	T1.3	007322	US100	005276	WRT1 =	176036 G	Y50TBL 012412
T\$\$SOF= 010003	T2	007432 G	UTO	003246	WT	014376	Y60TBL 012432
T\$\$SUB= 010024	T3	007606 G	UTOERR	002744 G	XTBL	012412	.DX = 020400
T\$\$W = 010002	T4	011300 G	UTOX	003314	X\$ALWA=	000000	.DY = 000000
T\$\$TES= 010027	UAM	= 000200 G	UUT	002652 G	X\$FALS=	000040	.I = 040000
T1							

. ABS. 015004 000  
 000000 001

ERRORS DETECTED: 0

VIRTUAL MEMORY USED: 38120 WORDS ( 149 PAGES)  
 DYNAMIC MEMORY: 20060 WORDS ( 77 PAGES)  
 ELAPSED TIME: 00:03:52  
 ZVSVA0.BIN,ZVSVA0.LST/-SP=LB:SYSMAC/ML, LB:SVC34R/ML,SY:ZVSVA0