

IDENTIFICATION

| | |
|---------------|--------------------------|
| PRODUCT CODE: | MAINDEC-8E-D6CB-D |
| PRODUCT NAME: | VC-8E DISPLAY DIAGNOSTIC |
| DATE CREATED: | OCTOBER 22, 1971 |
| MAINTAINER: | DIAGNOSTIC GROUP |
| AUTHOR: | PATRICK COYNE |

VC-8E DISPLAY DIAGNOSTIC

1. ABSTRACT

THE VC-8E DISPLAY DIAGNOSTIC IS A PROGRAM WHICH FACILITATES THE CALIBRATION CHECK-OUT, AND DIAGNOSIS OF A VC-8E DISPLAY. ALL ERRORS ARE VISUAL EXCEPT FOR THE CONTROL LOGIC TEST, WHICH PROVIDES ERROR TYPEOUT AND SCOPE LOOPS.

2. REQUIREMENTS

EQUIPMENT *****

POP-8E COMPUTER, 1TY OR HIGH SPEED READER
M869 QUAD MODULE (DISPLAY CONTROL)
M889 QUAD MODULE (D/A CONVERTER)
TEKTRONIX 453 SCOPE OR EQUIVALENT
VR-14, VR83A OR EQUIVALENT DISPLAY

STORAGE *****

THE PROGRAM OCCUPIES MEMORY LOCATIONS 0000 TO 4600

3. LOADING PROCEDURE

LOAD PROGRAM VIA BINARY LOADER.

4. STARTING PROCEDURE

CONTROL SWITCH SETTING

| SWITCH REGISTER | SET AS | ACTION ON PROGRAM |
|-----------------|--------|---|
| 0 | 1 0 | PROCEED TO NEXT CALIBRATE BIT. |
| 1 | 1 0 | Y AXIS X AXIS |
| 2 | 1 0 | VR03A VR14 |
| 3 | 1 0 | VR14 CHANNEL 2 VR14 CHANNEL 1 |
| 4 | 1 0 | EXIT SCOPE LOOP HANG IN SCOPE LOOP |
| 5 | 1 0 | (DIAGONAL LINE TEST) PLOT UL TO LR DIAGONAL PLOT LL TO UR DIAGONAL (VERTICAL OR HORIZONTAL BAR TEST) HALT LINE MOVEMENT CONTINUE LINE MOVEMENT |
| 6 | 1 0 | SELECT 615X 10I SELECT 605X 10I |
| 7 | 1 0 | PERFORM TEST SELECTED BY SWITCHES 8-11, RETURN/STAY IN DISPATCH ROUTINE. |
| 8 | | CONTAINS NUMBER OF TEST |
| 9 | | TO BE EXECUTED. |
| 10 | | (REFER TO TEST SELECTION TABLE) |
| 11 | | |

PROGRAM AND/OR OPERATOR ACTION -----

- A. LOAD PROGRAM INTO MEMORY PER SECTION 3.
- B. SET ADDRESS TO 200
- C. LOAD ADDRESS
- D. TEST THAT IS TO BE RUN MAY NOW BE SELECTED VIA SWITCHES 0-13. SW7 MUST BE SET TO A ONE TO PERFORM TEST. PROGRAM WILL TYPE

"SELECT TEST"

ANY TIME SW7 IS A ZERO AND WILL HANG IN DISPATCH ROUTINE UNTIL SW7 IS SET TO A ONE.

- E. THE VC-8E CAN OPERATE WITH EITHER OF TWO SETS OF IOT INSTRUCTIONS, 605X AND 615X, THROUGH THE USE OF JUMPER CONNECTIONS ON THE M869 CONTROL BOARD. REFERENCE THE ENGINEERING SPECS FOR THE CONFIGURATION OF THESE JUMPERS. THESE IOT'S CAN BE CHANGED AT ANY TIME BY THE SETTING OF SW6 (REFER TO CONTROL SWITCH SETTING TABLE). IT IS NECESSARY THAT SW6 BE PUT IN THE DESIRED POSITION BEFORE ENTERING THE DISPATCH ROUTINE THAT IS BEFORE PUTTING SW7 TO A ZERO.

- F. DEPRESS CLEAR, CONTINUE.

DISPLAY TEST SELECTION -----

| SW8 TO 11 | TEST SELECTED |
|-----------|-------------------------|
| 0000 (0) | NO TEST |
| 0001 (1) | CONTROL LOGIC TEST |
| 0010 (2) | RAMP SLEWING |
| 0011 (3) | DC CALIBRATION |
| 0100 (4) | DISPLAYED CALIBRATION |
| 0101 (5) | CROSSING DIAGONALS TEST |
| 0110 (6) | HORIZONTAL FLYBACK TEST |
| 0111 (7) | VERTICAL FLYBACK TEST |
| 1000 (10) | CORNERS TEST |
| 1001 (11) | DIAGONAL LINE TEST |
| 1010 (12) | VERTICAL BAR TEST |
| 1011 (13) | HORIZONTAL BAR TEST |
| 1100 (14) | SINGLE POINT PLOT TEST |
| 1101 (15) | NO TEST |
| 1110 (16) | NO TEST |
| 1111 (17) | NO TEST |

5. ERRORS

EXCEPT FOR THE CONTROL LOGIC TEST ALL ERRORS ARE DETERMINED BY VISUAL INSPECTION.

AN ERROR OCCURING DURING THE CONTROL LOGIC TEST WILL CAUSE AN ERROR TYPEOUT GIVING THE NUMBER OF THE TEST AND AN IDENTIFICATION OF THE ERROR. THE PROGRAM WILL THEN ENTER A SCOPE LOOP, UNLESS SW4 HAS PREVIOUSLY BEEN SET TO A ONE. TO EXIT THE SCOPE LOOP SIMPLY PUT SW4 TO A ONE.

6. RESTRICTIONS

STARTING RESTRICTIONS

NONE, PROGRAM MAY BE RESTARTED FROM LOCATION 200 AT ANY TIME.

7. PROGRAM DESCRIPTION

THE MASTER DISPATCH ROUTINE FOR TRANSFERRING CONTROL TO A SPECIFIC TEST STARTS AT LOCATION 200. TO SELECT A PARTICULAR TEST, SET SW8-11 TO THE TEST NUMBER DESIRED AND THEN SET SW7 TO A ONE. RECOVERY TO THE DISPATCH ROUTINE CAN BE MADE FROM ANY TEST BY SETTING SW7 TO A ZERO. IN ANY TEST WHICH THE OPERATOR HAS THE OPTION OF SELECTING THE X OR Y AXIS, IT IS NECESSARY TO DO SO BEFORE THE TEST IS ENTERED. WHEN THE OPERATOR DECIDES TO CHANGE THE AXIS IT IS NECESSARY TO EXIT THE TEST BY PUTTING SW7 TO A ZERO, CHANGE THE AXIS SELECT SWITCH (SW1) TO THE APPROPRIATE POSITION AND THEN RE-ENTER THE TEST BY PUTTING SW7 TO A ONE. IT SHOULD BE NOTED THAT TWO OF THE TESTS IN THIS DIAGNOSTIC WERE INCLUDED TO COVER A MINIMUM CONFIGURATION SYSTEM WHICH MEANS THE USER MAY NOT HAVE A DISPLAY ON THE SYSTEM. IF A DISPLAY IS NOT AVAILABLE THE "RAMP TEST" AND "DC CALIBRATION TEST" MUST BE RUN TO FACILITATE THE CHECKOUT OF THE O/A MODULE. REFER TO THE INDIVIDUAL TEST DESCRIPTION FOR MORE DETAILED INFORMATION ON EACH TEST. ANY SYSTEM EQUIPPED WITH A VR-14 DISPLAY SHOULD BE CHECKED FOR CHANNEL SELECTION ABILITY, ANY OF THE TESTS WHICH DISPLAYS A PATTERN ON THE SCREEN CAN BE MADE TO DISPLAY THE PATTERN ON VR-14 CHANNEL ONE OR TWO UNDER CONTROL OF SW3. SW3-0, SELECTS CHANNEL 1, SW3-1, SELECTS CHANNEL 2.

CONTROL LOGIC TEST

THIS TEST EXERCISES THE CONTROL LOGIC PORTION OF THE VCBE. IT IS DIVIDED UP INTO 12 SUB-TESTS. THIS IS THE ONLY TEST IN THIS DIAGNOSTIC WHICH CONTAINS SCOPE LOOPS AND ERROR TYPE-OUTS. WHEN AN ERROR IS ENCOUNTERED AN ERROR MESSAGE IS TYPED OUT GIVING A BRIEF DESCRIPTION OF THE ERROR AND THE PROGRAM WILL GO INTO A SCOPE LOOP ON THE ERROR. THE USER MAY EXIT THE SCOPE LOOP AT ANY TIME BY PUTTING SW4 TO A ONE. THE PROGRAM WILL THEN CONTINUE TO LOOP THROUGH THE TEST, TYPING OUT ALL ERRORS THAT ARE ENCOUNTERED BUT NOT ENTERING A SCOPE LOOP. IF SW4 IS THEN PUT BACK IN THE ZERO POSITION THE PROGRAM WILL ENTER A SCOPE LOOP ON THE NEXT ERROR IT ENCOUNTERS. THERE ARE TWO SWITCHES LOCATED ON THE CONTROL LOGIC MODULE (M069); ONE (Z) CONTROLLING THE POLARITY OF THE INTENSIFY PULSE AND ONE (DELAY) WHICH DETERMINES THE TIME DELAY IN SETTING THE DONE FLAG AFTER GIVING A LOAD X OR LOAD Y COMMAND.

THESE SWITCHES ARE SET IN THE FOLLOWING MANNER:
 SWITCH NAME POSITION
 Z +
 DELAY L S

DELAY

VR-14
VR03A

SWITCH 2 SHOULD BE SET PRIOR TO ENTERING THE CONTROL LOGIC TEST TO SELECT EITHER A VR-14 OR VR03A MODE OF OPERATION.
 SW2=0, SELECTS VR=14
 SW2=1, SELECTS VR03A
 THE MESSAGE "CONTROL LOGIC TEST" IS TYPED UPON ENTERING THE TEST AND AFTER EVERY COMPLETE PASS.
 THIS TEST IS REPEATED AS LONG AS SW7 IS A ONE, AND SW8=11 INDICATE THIS TEST.

RAMP TEST -----

THIS TEST GENERATES A SAWTOOTH PATTERN AT THE X OR Y DAC OUTPUTS (DEPENDENT ON THE SETTING OF SW1); TO OBSERVE THIS PATTERN IT IS NECESSARY TO HANG A SCOPE PROBE ON THE TEST POINTS LABELED X AND Y OF THE M885 D/A BOARD, THE WAVEFORM WILL START AT -5 VOLTS, RISE IN A RAMP TO +5 VOLTS AND DEFLECT FULL SCALE (10 VOLTS) BEFORE RISING AGAIN. THE RAMP SHOULD BE A STRAIGHT UNBROKEN LINE, ANY BREAKS OR STEPS IN THE RAMP WOULD INDICATE THAT A BIT IS NOT SWITCHING OR IS NOT WEIGHTED CORRECTLY, THIS TEST IS REPEATED AS LONG AS SW7 IS A ONE, AND SW8=11 INDICATE THIS TEST.

DC CALIBRATION TEST -----

THIS TEST AIDS IN THE CALIBRATION OF THE X AND Y D/A'S WHEN NO DISPLAY IS AVAILABLE, SW1 IS AGAIN USED TO SELECT THE X OR Y AXIS AND SHOULD BE SET PRIOR TO ENTERING THE ROUTINE. UPON ENTERING THIS TEST THE FIRST VALUE OF THE CALIBRATION TABLE IS LOADED INTO THE DAC SELECTED, AND OUTPUT TO THE TELETYPE, THE PROGRAM WILL THEN HALT, WHEN THE OPERATOR WISHES TO CONTINUE TO THE NEXT CALIBRATION VALUE HE SIMPLY DEPRESSES KEY CONTINUE, THE OPERATOR CAN GO THROUGH THE ENTIRE CALIBRATION TABLE IN THIS MANNER, THE USER CAN EXIT THE TEST AT ANY TIME BY PUTTING SW7 TO A ZERO BEFORE HE DEPRESSES KEY CONTINUE, OR BY RESTARTING THE PROGRAM AT LOCATION 200, FOR THE VOLTAGE VALUES WHICH SHOULD BE OBSERVED FOR EACH OF THE VALUES OF THE CALIBRATION TABLE, AND FOR A STEP-BY-STEP PROCEDURE ON HOW TO IMPLEMENT THIS TEST REFER TO THE ENGINEERING SPECIFICATIONS.

DC CALIBRATION TABLE -----

| |
|------|
| 0777 |
| 0776 |
| 0775 |
| 0773 |
| 0767 |
| 0757 |
| 0740 |
| 0737 |
| 0700 |
| 0677 |
| 0600 |
| 0577 |
| 0400 |
| 0377 |
| 0000 |
| 1777 |

DISPLAYED CALIBRATION TEST

THIS TEST IS USED TO CALIBRATE THE D/A'S WHEN A VR-14 OR EQUIVALENT DISPLAY IS AVAILABLE. UPON ENTERING THE TEST THE FIRST VALUE OF A CALIBRATION TABLE IS OUTPUT BY SW1. THE VALUE IS ALSO PLOTTED ON THE Y D/A SELECTED BY SW1, AND THE PROGRAM PROCEEDS TO THE NEXT CALIBRATION VALUE, AND THE LINE ON THE SCREEN WILL BECOME LARGER UNTIL A SOLID STRAIGHT LINE IS DISPLAYED ON THE SCREEN, AS THE LINE GROWS IT SHOULD BE OBSERVED FOR GAPS OR OVERLAPPED LINES. EITHER OF THESE CONDITIONS WILL NECESSITATE AN ADJUSTMENT OF ONE OF THE CONTROL POT'S ON THE M885 D/A MODULE. REFER TO THE ENGINEERING SPECIFICATIONS FOR THE NAMES AND LOCATIONS OF THESE POT'S. THIS PROCEDURE MUST BE FOLLOWED FOR BOTH THE X AND Y AXIS.

DISPLAYED CALIBRATION TABLE

0000
0001
0003
0007
0017
0037
0077
0177
0377
0777
1777

CROSSING DIAGONALS TEST

THIS TEST DISPLAYS TWO DIAGONAL LINE SEGMENTS OF EQUAL LENGTH WHICH SHOULD CROSS IN THE CENTER OF THE SCREEN, THE LINES SHOULD BE STRAIGHT AND UNBROKEN WITH NO EVIDENCE OF ANY TRACE ON THE TRANSITION POINTS (ENDS) BETWEEN THE TWO LINES. THIS TEST IS REPEATED AS LONG AS SW7 IS A ONE, AND SW8-11 INDICATE THIS TEST.

HORIZONTAL FLYBACK TEST

THIS TEST DISPLAYS FOUR HORIZONTAL LINE SEGMENTS AT THE CORNERS OF THE DISPLAY. IT IS USED TO CHECK FOR ANY SIGNS OF FLYBACK TRACES AT THE ENDS OF THE LINES AND ALSO FOR HYSTERESIS INTERFERENCE ON MAGNETIC DEFLECTION DISPLAYS. THE LINE SEGMENTS ARE PLOTTED IN THE FOLLOWING ORDER:
256 POINTS TO THE RIGHT AT THE LOWER LEFT HAND CORNER;
256 POINTS TO THE RIGHT AT THE UPPER LEFT HAND CORNER;
256 POINTS TO THE LEFT AT THE LOWER RIGHT HAND CORNER;
256 POINTS TO THE LEFT AT THE UPPER RIGHT HAND CORNER;
ALL LINE SEGMENTS SHOULD BE STRAIGHT WITH NO DISTORTION. THIS TEST IS REPEATED AS LONG AS SW7 IS A ONE, AND SW8-11 INDICATE THIS TEST.

VERTICAL FLYBACK TEST

THIS TEST IS IDENTICAL TO THE HORIZONTAL TEST EXCEPT THAT THE LINES ARE PLOTTED IN THE VERTICAL DIRECTION AT THE TOP AND BOTTOM EDGES OF THE DISPLAY, AND SW8=11 INDICATE THIS TEST.

CORNERS TEST

THIS TEST COMBINES THE PREVIOUS TWO TESTS, IN THAT THROUGH THE USE OF VERTICAL AND HORIZONTAL LINE SEGMENTS CORNERS ARE FORMED IN EACH OF THE FOUR CORNERS OF THE DISPLAY. AN ADDED FEATURE IS THE USE OF INTERSECTING DIAGONAL LINE SEGMENTS IN EACH OF THE FOUR CORNERS, AGAIN ALL LINES SHOULD BE STRAIGHT AND UNBROKEN AND THE DIAGONAL LINES SHOULD INTERSECT AT THE CENTER OF EACH CORNER. THIS TEST IS REPEATED AS LONG AS SW7 IS A ONE, AND SW8=11 INDICATE THIS TEST.

DIAGONAL LINE TEST

THIS TEST DISPLAYS A FULL (1024 POINTS) DIAGONAL LINE. UPON ENTERING THE ROUTINE SW5 IS TESTED TO DETERMINE ITS POSITION, SW5=0 WILL CAUSE A DIAGONAL LINE TO BE DISPLAYED FROM THE LOWER LEFT CORNER TO THE UPPER RIGHT CORNER OF THE SCREEN. SW5=1 WILL CAUSE A DIAGONAL LINE TO BE DISPLAYED FROM THE UPPER LEFT CORNER TO THE LOWER RIGHT CORNER OF THE SCREEN. THIS TEST IS REPEATED AS LONG AS SW7 IS A ONE, AND SW8=11 INDICATE THIS TEST.

VERTICAL BAR TEST

THIS TEST PLOTS A FULL VERTICAL BAR (1024 POINTS) MOVING HORIZONTALLY ACROSS THE DISPLAY, THE MOVEMENT OF THE BAR CAN BE CONTROLLED BY SW5, SW5=0 ALLOWS THE BAR TO MOVE ACROSS THE SCREEN, SW5=1 HALTS THE MOVEMENT OF THE BAR. THIS TEST ALLOWS THE USER TO EXAMINE THE CRT FOR SCOPE BURNS. LIKE ALL THE TESTS IN THIS DIAGNOSTIC THIS TEST CAN BE EXITED BY PUTTING SW7 TO A ZERO, HOWEVER THIS TEST WILL ONLY EXIT AT THE COMPLETION OF A PASS OF THE BAR ACROSS THE SCREEN. THIS TEST IS REPEATED AS LONG AS SW7 IS A ONE, AND SW8=11 INDICATE THIS TEST.

HORIZONTAL BAR TEST

THIS TEST IS IDENTICAL TO THE VERTICAL BAR TEST EXCEPT THAT A HORIZONTAL BAR IS MOVED IN THE VERTICAL DIRECTION,

SINGLE POINT PLOT TEST

THIS TEST DISPLAYS A POINT DETERMINED BY THE SETTING OF THE SWITCHES, UPON SELECTION OF THIS TEST THE COMPUTER WILL STOP TO ALLOW THE USER TO SET IN:

A. THE "X" COORDINATE,

B. THE "Y" COORDINATE,

C. RESET THE SWITCH OPTIONS,

LISTING

//INSTRUCTION EQUALITIES//

4130 DICL=JMS X01CL /CLEAR ENABLES, FLAGS, DELAYS,
 4134 D1CD=JMS X01CD /CLEAR DONE FLAG,
 4140 DISD=JMS X01SD /SKIP ON DONE FLAG, DO NOT CLEAR FLAG,
 4145 D1LX=JMS X01LX /CLEAR DONE FLAG, LOAD X, WAIT FOR SETTLE,
 4151 D1LY=JMS X01LY /SET DONE, DO NOT CLEAR AC,
 4155 D1XY=JMS X01XY /CLEAR DONE FLAG, LOAD Y, WAIT FOR SETTLE,
 4161 D1LE=JMS X01LE /SET DONE, DO NOT CLEAR AC,
 4165 D1RE=JMS X01RE /CLEAR DONE FLAG, INTENSIFY, SET DONE,
 4025 SETUP=JMS PRESET /LOAD ENABLE REGISTER, CLEAR AC,
 4101 ERROR=JMS FAIL /TRANSFER ENABLE TO AC,
 6007 CAF=6007
 7402 XX=7402

0001 *1 JMP I RETURN
 5402 RETURN, 0
 0000 SUM1, 0
 0003 0000
 0004 0000
 0005 0000
 0020 *20 DISRET, DISMSG /RETURN TO DISPATCH ROUTINE
 0213

0021 0000 TALLYA, 0
 0022 0000 NXTST, 0
 0023 0000 GETBAK, 0
 0024 0000 DELAY, 0
 0025 0000 PRESET, 0
 0026 7200 CLA
 0027 3004 DCA
 0030 1177 TAD
 0031 3005 DCA
 0032 4036 JMS
 0033 2035 ISZ
 0034 5425 JMP I
 //HOUSEKEEPING ROUTINE FOR CONTROL LOGIC TEST//

0035 7062 MSGPNT, ERRMSG
 //ERROR MESSAGE POINTER//

0036 0000 CKSW7, ?
 //ROUTINE TO CHECK LOOP BIT, S1R,7//
 /GET S1R,

```

0037 7604      LAS
0040 0176      AND
0041 7650      SNA CLA
0042 5420      JMP I
0043 5436      JMP I   CKSW7
                /GET S,R;
                /MASK BIT 7
                /S,R,7=0?
                /YES, RETURN TO DISPATCH
                /NO, LOOP IN CURRENT TEST

```

//ROUTINE TO SELECT CHANNEL FOR VR14//

```

SELCHN, 0
0044 0000      LAS
0045 7604      AND
0046 0175      SZA CLA
0047 7640      JMP
0048 5053      DLE
0049 4161      JMP I
0050 5444      SELCHN
0051 5444      TAD
0052 5444      DLE
0053 1174      JMP I
0054 4161      SELCHN
0055 5444      JMP I

```

//SUBROUTINE CONTAINING IOT TO BE EXECUTED//

```

//
0056 0000      IOTT, 0
0057 7000      7000
0058 7000      7000
0059 5456      JMP I   IOTT
                /MODIFIED TO CONTAIN IOT

```

//ERROR MESSAGE LINKS//

```

ERRMSG,
0062 3676      MSG1
0063 3717      MSG1A
0064 3747      MSG1B
0065 4001      MSG1C
0066 4031      MSG2
0067 4060      MSG3
0068 4110      MSG4
0069 4140      MSG5
0070 4161      MSG6
0071 4205      MSG7
0072 4240      MSG8
0073 4266      MSG9
0074 4313      MSG10
0075 4346      MSG11
0076 4370      MSG12

```

//SUBROUTINE TO HANDLE ERROR=SCOPE LOOPING//

```

FAIL, 0
0101 0000      CLA
0102 7200      TAD
0103 1004      ERSWIT
0104 7650      SNA CLA
0105 4122      JMS
0106 1173      TAD
0107 3024      DCA
0108 1501      TAD I
0109 3023      DCA
0110 2101      ISE
0111 2101      ISE
0112 2101      ISE

```

```

0113 1501 TAD I FAIL
0114 3022 DCA NXTST
0115 7604 LAS
0116 0172 AND (0220
0117 7650 SNA CLA
0120 5423 JMP I GETBAK
0121 5422 JMP I NXTST

//ERROR TYPEOUT SUBROUTINE//
ERTYPE, 0
0122 0000 TAD I MSGPNT
0123 1435 DCA EOUT
0124 3126 JMS MESSAGE
0125 4771 HLT
0126 7402 JMP I ERTYPE
0127 5522

//IOT SUBROUTINES//
//
0130 0000 XDICL, 0
0131 6050 RDICL, 0
0132 5530 JMP I XDICL
0133 7402 HLT

0134 0000 XDICD, 0
0135 6051 RDICD, 0
0136 5534 JMP I XDICD
0137 7402 HLT

0140 0000 XDISD, 0
0141 6052 RDISD, 0
0142 7410 SKP
0143 2140 ISZ XDISD
0144 5540 JMP I XDISD

0145 0000 XDILX, 0
0146 6053 RDILX, 0
0147 5545 JMP I XDILX
0148 7402 HLT
0149 0000 XDILY, 0
0150 6054 RDILY, 0
0151 5551 JMP I XDILY
0152 7402 HLT

0155 0000 XDIXY, 0
0156 6055 RDIXY, 0
0157 5555 JMP I XDIXY
0158 7402 HLT

0161 0000 XDILE, 0
0162 6056 RDILE, 0
0163 5561 JMP I XDILE
0164 7402 HLT

0165 0000 XDIRE, 0

```

/CLEAR ENABLES, FLAGS, DELAYS,

/CLEAR DONE FLAG,

/SKIP ON DONE FLAG,

/LOAD X BUFFER,

/LOAD Y BUFFER,

/INTENSIFY,

/LOAD ENABLE REGISTER,

0166 6057 RDIRE, 6057 /TRANSFER ENABLE TO AC;

0167 5565 JMP 1 XDIRE

0170 7402 HLT

*200
SIART,

0200 CAF
0207 ISZ
0201 2255
0213 JMP
0203 4777, MSG1
0204 3200
0205 4777, JMS
0206 3224 MSG2
0207 4777, JMS
0210 3236 MSG3
0211 4777, JMS
0212 3266 MSG4

DISMSG, CAF
0213 6007
0214 4777, JMS
0215 3322 MSG5

//MASTER DISPATCH ROUTINE FOR TEST SELECTION//

//

DISPAT, CLA CLL
0216 7300 LAS
0217 7604 AND (0040
0220 0376 CLL RAL
0221 7104 DCA M10T
0222 3321 JMS SET10T
0223 4256 LAS
0224 7604 AND (20
0225 0375 SNA DISPAT
0226 7450 JMP
0227 5216 LAS
0230 7604 AND (17
0231 0374 TAD (JMP 1 TEST+1
0232 1373 DCA TEST
0233 3234

TEST,

0234 0000
0235 0213
0236 0600
0237 0457
0240 0400
0241 2242
0242 2400
0243 1400
0244 1434
0245 1600
0246 2000
0247 2023
0250 2057
0251 2200
0252 0213
0253 0213

DISMSG
CLTST
RMTST
CALTST
D1STST
CROTST
HORTST
VERTST
CORTST
CBTST
VRBTST
HRBTST
PNTST
DISMSG
DISMSG
/S,R,10, NO TEST
/S,R,11, CONTROL LOGIC TEST
/S,R,12, RAMP TEST
/S,R,13, DC CALIBRATION TEST
/S,R,14, DISPLAYED CALIBRATION TEST
/S,R,15, CROSSING DIAGONALS TEST
/S,R,16, HORIZONTAL FLYBACK TEST
/S,R,17, VERTICAL FLYBACK TEST
/S,R,18, CORNERS TEST
/S,R,19, DIAGONAL LINE TEST
/S,R,20, VERTICAL BAR TEST
/S,R,21, HORIZONTAL BAR TEST
/S,R,22, SINGLE POINT PLOT TEST
/S,R,23, NO TEST
/S,R,24, NO TEST

0254 3213 DISMSG /S,R,17, NO TEST
 0255 7777 TITLE, 7777 /TYPE OUT HEADER ONE TIME ONLY,

//ROUTINE TO MODIFY ALL LOT'S//
 //

| | | | |
|------|------|-------------|--------|
| 0256 | 0000 | SETLOT, 0 | RDICL |
| 0257 | 1131 | AND | K7077 |
| 0260 | 0320 | TAD | MIOT |
| 0261 | 1321 | DCA | RDICL |
| 0262 | 3131 | TAD | RDICD |
| 0263 | 1135 | AND | K7077 |
| 0264 | 0320 | TAD | MIOT |
| 0265 | 1321 | DCA | RDICD |
| 0266 | 3135 | TAD | RDICD |
| 0267 | 1141 | AND | K7077 |
| 0270 | 0320 | TAD | MIOT |
| 0271 | 1321 | DCA | RDICD |
| 0272 | 3141 | TAD | RDILX |
| 0273 | 1146 | AND | K7077 |
| 0274 | 0320 | TAD | MIOT |
| 0275 | 1321 | DCA | RDILX |
| 0276 | 3146 | TAD | RDILY |
| 0277 | 1152 | AND | K7077 |
| 0300 | 0320 | TAD | MIOT |
| 0301 | 1321 | DCA | RDILY |
| 0302 | 3152 | TAD | RDILY |
| 0303 | 1156 | AND | K7077 |
| 0304 | 0320 | TAD | MIOT |
| 0305 | 1321 | DCA | RDILY |
| 0306 | 3156 | TAD | RDILE |
| 0307 | 1162 | AND | K7077 |
| 0310 | 0320 | TAD | MIOT |
| 0311 | 1321 | DCA | RDILE |
| 0312 | 3162 | TAD | RDIRE |
| 0313 | 1166 | AND | K7077 |
| 0314 | 0320 | TAD | MIOT |
| 0315 | 1321 | DCA | RDIRE |
| 0316 | 3166 | JMP 1 | SETLOT |
| 0317 | 5656 | | |
| 0320 | 7077 | K7077, 7077 | |
| 0321 | 0000 | MIOT, 0 | |

0373 5635
 0374 2017
 0375 2020
 0376 2040
 0377 4000
 1400

//DC CALIBRATION ROUTINE//

```

0400 6007  CALIST, CAF
0401 4777,  JMS
0402 3332  MSG6
0403 7200  CLA
0404 1376  TAD
0405 3255  DCA
0406 7604  LAS
0407 0375  AND
0410 7650  SNA CLA
0411 5215  JMP
0412 1374  TAD
0413 3057  DCA
0414 5217  JMP
0415 1373  TAD
0416 3057  DCA
0417 1372  TAD
0420 3256  DCA
0421 1656  TAD I
0422 3003  DCA
0423 4771,  JMS
0424 1003  TAD
0425 4056  JMS
0426 7402  HLT
0427 4036  JMS
0430 2256  ISZ
0431 2255  ISZ
0432 5221  JMP
0433 5203  JMP

      CALIB,
      CALX,
      CALY,
      GETVAL,
      UPDVAL,
      SUM1,
      CALSND,
      SUM1,
      CKSW7,
      PNTR1,
      CALCNT,
      UPDVAL,
      CALIB

      (=20
      CALCNT
      (=2000
      CALX
      (=DILY
      IOTT+1
      GETVAL
      (=DILX
      IOTT+1
      (=TABLE
      PNTR1
      PNTR1
      SUM1
      CALSND
      SUM1
      IOTT
      CKSW7
      PNTR1
      CALCNT
      UPDVAL
      CALIB
  
```

//CALIBRATION TABLE//

```

TABLE,
0434 0777
0435 0776
0436 0775
0437 0773
0440 0767
0441 0757
0442 0740
0443 0737
0444 0700
0445 0677
0446 0600
0447 0577
0450 0400
0451 0377
0452 0000
0453 1777

SWITCH, 0
CALCNT, 0
PNTR1, 0
  
```

```

0457 6007 RMPTST, CAF //RAMP TEST//
0460 4777, JMS //
0461 3346 MSG7 MESSAGE
0462 7300 RAMP, CLA CLL
0463 7604 LAS (2000
0464 0375 AND SNA CLA
0465 7650 JMP XAMP
0466 5272 TAD (DILY
0467 1374 DCA IOTT-1
0470 3057 JMP RAMPA-1
0471 5274 TAD (DILX
0472 1373 TAD IOTT-1
0473 3057 DCA IOTT-1
0474 1370 TAD (1000
0475 4056 JMS IOTT
0476 1367 TAD (1
0477 3303 DCA SAVIT
0500 4036 JMS CKSN7
0501 1303 TAD SAVIT
0502 5275 JMP RAMPA

0503 0000 SAVIT, 0

```

```

/PICK UP S.R.
/CHECK SW1, TO DETERMINE
/X OR Y AXIS
/GOTO X AXIS SETUP
/SETUP Y AXIS
/IOT
/GOTO RAMP ROUTINE
/SETUP X AXIS
/IOT
/RAMP ORIGIN
/SETUP DAC SELECTED
/INCREMENT RAMP
/CHECK TEST LOOP SWITCH
/CONTINUE RAMP

```

PAGE

```

0600 6007 CLTST, CAF //CONTROL LOGIC TEST//
0601 4777, JMS //
0602 3355 MSG8 MESSAGE
0603 7200 CLA (=200
0604 1376 TAD TALLYA
0605 3021 DCA /CHECK DATA TRANSFERS, AC AND ENABLE REGISTERS;

0626 4025 /
0607 1375 SETUP
0610 3035 TAD (ERRMSG
0611 7300 DCA MSGPNT
0612 1374 CLT1, CLA CLL
/BRING AC TO ALL ONES,

```

```

0613 4161      DILE
0614 7650      SNA CLA
0615 5221      JMP      ,+4
0616 4101      ERROR
0617 0611      CLT1
0620 0623      CLT1A=1
0621 2005      ISZ
0622 5211      JMP      /
0623 4025      SETUP
0624 7300      CLA CLL
0625 1373      TAD      (0002
0626 4161      DILE
0627 4165      DIRE
0630 0373      AND
0631 7640      SZA CLA
0632 5236      JMP      ,+4
0633 4101      ERROR
0634 0624      CLT1A
0635 0640      CLT1B=1
0636 2005      ISZ
0637 5224      JMP      /
0640 4025      SETUP
0641 7300      CLA CLL
0642 1372      TAD      (0001
0643 4161      DILE
0644 4165      DIRE
0645 0372      AND
0646 7640      SZA CLA
0647 5233      JMP      ,+4
0650 4101      ERROR
0651 0641      CLT1B
0652 0655      CLT1C=1
0653 2005      ISZ
0654 5241      JMP      /
0655 4025      SETUP
0656 7300      CLA CLL
0657 1373      TAD      (0002
0660 4161      DILE
0661 4165      DIRE
0662 0373      AND
0663 7640      SZA CLA
0664 5270      JMP      ,+4
0665 4101      ERROR
0666 0656      CLT1C
0667 2072      CLT2=1
0670 2005      ISZ
0671 5256      JMP      /
0672 4025      /CHECK THAT DILE WILL CLEAR ENABLES
0673 5256      /
0674 5256      SETUP

```

/TRANS, TO ENABLE AND CLR AC,

/AC CLEAR, CONTINUE,
 /DILE FAILED TO CLR AC,
 /ERROR=SCOPE LOOP ADDRESS,
 /NEXT TEST,
 /TEST LOOP COUNT,
 /RETURN,

/SET CHANNEL FZF = 1,
 /READ ENABLE INTO AC,
 /MASK TO CHECK FOR CHANNEL = 1,

/CHANNEL SET AND READ BACK;
 /FAILED, CHNL NOT SET OR NOT READ BACK,
 /ERROR=SCOPE LOOP ADDRESS,
 /NEXT TEST,
 /TEST LOOP COUNT,
 /RETURN,

/SET INTERRUPT ENABLE,
 /READ ENABLE INTO AC,
 /MASK TO CHECK FOR INT, ENABLE,

/INT, SET AND READ BACK;
 /FAILED, INT, NOT SET OR READ BACK,
 /ERROR=SCOPE LOOP ADDRESS,
 /NEXT TEST,
 /TEST LOOP COUNT,
 /RETURN,

/SET CHANNEL,
 /READ ENABLE INTO AC,
 /MASK TO CHECK FOR CHANNEL BIT,

/CHANNEL SET AND READ BACK;
 /FAILED, CHNL NOT SET OR READ BACK,
 /ERROR=SCOPE LOOP ADDRESS,
 /NEXT TEST,
 /TEST LOOP COUNT,
 /RETURN,

/CHECK THAT DILE WILL CLEAR ENABLES

/

SETUP

```

0073 7300          CLT2,  CLA CLL
0074 1371          TAD      (4003)
0075 4161          DILE
0076 4130          DIDL
0077 4165          DIRE
0078 7650          SNA CLA
0079 5305          JMP      ,+4
0080 4101          ERROR
0081 0073          CLT2
0082 0077          CLT3=1
0083 2005          ISZ
0084 5273          JMP

```

/CHECK THAT DILX WILL SET DONE AND NOT CLEAR AC.

```

0073 7300          CLT3,  CLA CLL
0074 1371          TAD      (7777)
0075 4161          DCA      DELAY
0076 4130          LAS      (1000)
0077 4165          AND      SZA CLA
0078 7650          JMP      ,+3
0079 5305          TAD      (=16)
0080 4101          DCA      DELAY
0081 0073          TAD      (7777)
0082 0077          DICO
0083 2005          DILX
0084 5273          ISZ      DELAY
0085 4101          JMP      ,+1
0086 4130          DISD
0087 7410          SKP
0088 5334          JMP      ,+4
0089 4101          ERROR
0090 0710          CLT3
0091 0710          CLT4=1
0092 7440          SZA
0093 5341          JMP      ,+4
0094 4101          ERROR
0095 0710          CLT3
0096 0710          CLT4=1
0097 1000          ISZ
0098 2005          JMP
0099 5310          CLT3
0100 5770          CLT4=1

```

/SETUP VALUE OF
/DELAY FOR VR03A SCOPE;
/GET S,R;
/CHECK BIT 2 FOR SCOPE SELECTION.
/SW 2 = 0, SETUP FOR VR14;
/SW 2 = 1, SETUP FOR VR03A;
/SETUP VALUE OF
/DELAY FOR VR14;
/ALL 1'S TO AC;
/CLEAR DONE;
/LOAD X BUFFER;
/WAIT;
/SKIP ON DONE;
/DONE SET, CONTINUE;
/FAILED, DONE WAS NOT SET;
/ERROR=SCOPE LOOP ADDRESS;
/NEXT TEST;
/WAS AC CLEARED?
/NO, CONTINUE;
/YES, FAILED;
/ERROR=SCOPE LOOP ADDRESS;
/NEXT TEST;
/TEST LOOP COUNT;
/RETURN;
/NEXT TEST;

```

0767 7762
0770 1000
0771 4003
0772 7001
0773 7002
0774 7777
0775 7062
0776 7600
0777 4600

```

1000 PAGE

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1000 4025          /CHECK THAT DILY WILL SET DONE AND NOT CLEAR AC,
1001 7300          /
1002 1377          /
1003 3024          /CHECK THAT DILY WILL SET DONE AND NOT CLEAR AC,
1004 7604          /
1005 7376          /
1006 7640          /
1007 5212          /
1008 1375          /
1009 3024          /
1010 1377          /
1011 1377          /
1012 1377          /
1013 4134          /
1014 4151          /
1015 2024          /
1016 5215          /
1017 4140          /
1018 7410          /
1019 5225          /
1020 4101          /
1021 1001          /
1022 1001          /
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1025 7440          /
1026 5232          /
1027 4101          /
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1800 1035          /
1801 1035          /
1802 2005          /
1803 5235          /
1804 4025          /
1805 7300          /
1806 4130          /
1807 4155          /
1808 4140          /
1809 7410          /
1810 5246          /
1811 4101          /
1812 1035          /
1813 1035          /
1814 1035          /
1815 1035          /
1816 2005          /
1817 5235          /
1818 4025          /
1819 7300          /
1820 4130          /
1821 4155          /
1822 4140          /
1823 7410          /
1824 5246          /
1825 4101          /
1826 1035          /
1827 1035          /
1828 1035          /
1829 1035          /
1830 2005          /
1831 5235          /
1832 4025          /
1833 7300          /
1834 4130          /
1835 4155          /
1836 4140          /
1837 7410          /
1838 5246          /
1839 4101          /
1840 1035          /
1841 1035          /
1842 1035          /
1843 1035          /
1844 2005          /
1845 5235          /
1846 4025          /
1847 7300          /
1848 4130          /
1849 4155          /
1850 4140          /
1851 7410          /
1852 5246          /
1853 4101          /
1854 1035          /
1855 1035          /
1856 1035          /
1857 1035          /
1858 2005          /
1859 5235          /
1860 4025          /
1861 7300          /
1862 4130          /
1863 4155          /
1864 4140          /
1865 7410          /
1866 5246          /
1867 4101          /
1868 1035          /
1869 1035          /
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1871 1035          /
1872 2005          /
1873 5235          /
1874 4025          /
1875 7300          /
1876 4130          /
1877 4155          /
1878 4140          /
1879 7410          /
1880 5246          /
1881 4101          /
1882 1035          /
1883 1035          /
1884 1035          /
1885 1035          /
1886 2005          /
1887 5235          /
1888 4025          /
1889 7300          /
1890 4130          /
1891 4155          /
1892 4140          /
1893 7410          /
1894 5246          /
1895 4101          /
1896 1035          /
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1898 1035          /
1899 1035          /
1900 2005          /
1901 5235          /
1902 4025          /
1903 7300          /
1904 4130          /
1905 4155          /
1906 4140          /
1907 7410          /
1908 5246          /
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1912 1035          /
1913 1035          /
1914 2005          /
1915 5235          /
1916 4025          /
1917 7300          /
1918 4130          /
1919 4155          /
1920 4140          /
1921 7410          /
1922 5246          /
1923 4101          /
1924 1035          /
1925 1035          /
1926 1035          /
1927 1035          /
1928 2005          /
1929 5235          /
1930 4025          /
1931 7300          /
1932 4130          /
1933 4155          /
1934 4140          /
1935 7410          /
1936 5246          /
1937 4101          /
1938 1035          /
1939 1035          /
1940 1035          /
1941 1035          /
1942 2005          /
1943 5235          /
1944 4025          /
1945 7300          /
1946 4130          /
1947 4155          /
1948 4140          /
1949 7410          /
1950 5246          /
1951 4101          /
1952 1035          /
1953 1035          /
1954 1035          /
1955 1035          /
1956 2005          /
1957 5235          /
1958 4025          /
1959 7300          /
1960 4130          /
1961 4155          /
1962 4140          /
1963 7410          /
1964 5246          /
1965 4101          /
1966 1035          /
1967 1035          /
1968 1035          /
1969 1035          /
1970 2005          /
1971 5235          /
1972 4025          /
1973 7300          /
1974 4130          /
1975 4155          /
1976 4140          /
1977 7410          /
1978 5246          /
1979 4101          /
1980 1035          /
1981 1035          /
1982 1035          /
1983 1035          /
1984 2005          /
1985 5235          /
1986 4025          /
1987 7300          /
1988 4130          /
1989 4155          /
1990 4140          /
1991 7410          /
1992 5246          /
1993 4101          /
1994 1035          /
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1996 1035          /
1997 1035          /
1998 2005          /
1999 5235          /
2000 4025          /
2001 7300          /
2002 4130          /
2003 4155          /
2004 4140          /
2005 7410          /
2006 5246          /
2007 4101          /
2008 1035          /
2009 1035          /
2010 1035          /
2011 1035          /
2012 2005          /
2013 5235          /
2014 4025          /
2015 7300          /
2016 4130          /
2017 4155          /

```

```

7300      CLA CL6
1051      CIXY
1052      DICD
1053      DICE
1054      SNA CLA
1055      JMP
1056      ERROR
1057      CLT6
1060      CLT7-1
1061      ISZ
1062      TALLY
1063      CLT6
1064      JMP
1065      /SET DONE,
1066      /CLEAR DONE,
1067      /READ ENABLE STATUS INTO AC,
1068      /DONE CLEARED, CONTINUE,
1069      /FAILED, DONE NOT CLEARED,
1070      /ERROR=SCOPE LOOP ADDRESS,
1071      /NEXT TEST,
1072      /TEST LOOP COUNT,
1073      /RETURN,

```

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1064 4025
1065 7300
1066 4155
1067 4140
1068 4140
1069 7610
1070 7610
1071 5275
1072 4101
1073 1065
1074 1113
1075 4165
1076 7640
1077 5303
1078 4101
1079 1065
1080 1113
1081 4134
1082 4140
1083 5311
1084 4101
1085 1065
1086 1113
1087 4134
1088 4140
1089 5311
1090 4101
1091 1065
1092 1113
1093 4134
1094 4140
1095 5311
1096 4101
1097 1065
1098 1113
1099 4134
1100 4140
1101 5311
1102 4101
1103 1065
1104 1113
1105 4134
1106 4140
1107 5311
1108 4101
1109 1065
1110 1113
1111 4134
1112 4140
1113 5311
1114 4101
1115 1065
1116 1113
1117 4134
1118 4140
1119 5311
1120 4101
1121 1065
1122 1113
1123 4134
1124 4140
1125 5311
1126 4101
1127 1065
1128 1113
1129 4134
1130 4140
1131 5311
1132 4101
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1136 4140
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1140 1113
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1168 4101
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1170 1113
1171 4134
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1176 1113
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1188 1113
1189 4134
1190 4140
1191 5311
1192 4101
1193 1065
1194 1113
1195 4134
1196 4140
1197 5311
1198 4101
1199 1065
1200 1113
1201 4134
1202 4140
1203 5311
1204 4101
1205 1065
1206 1113
1207 4134
1208 4140
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1212 1113
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1326 1113
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1374 1113
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1386 1113
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1392 1113
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1404 1113
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1416 1113
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1452 1113
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1454 4140
1455 5311
1456 4101
1457 1065
1458 1113
1459 4134
1460 4140
1461 5311
1462 4101
1463 1065
1464 1113
1465 4134
1466 4140
1467 5311
1468 4101
1469 1065
1470 1113
1471 4134
1472 4140
147
```

```

1113 4025 /CHECK THAT INTERRUPT ENABLE REGISTER ALONE WILL
1114 7300 /NOT CAUSE AN INTERRUPT.
1115 1374 SETUP
1116 3002 CLA CLL
1117 6007 TAD (ERR8
1120 1373 TAD RETURN
1121 4161 DCA
1122 6001 CAF
1123 7000 CAF
1124 6002 TAD (2001
1125 5331 DLE
1126 4101 ION
1127 1114 NOP
1128 1114 JOF
1129 1114 JMP ,+4
1130 1114 ERROR
1131 1114 CLT8

```

```

1130 1200      CLT9=1
1131 2005      ISZ
1132 5314      JMP
1133 5772      JMP
      /NEXT TEST;
      /TEST LOOP COUNT;
      /RETURN;
      /NEXT TEST;

```

```

1172 1200
1173 0001
1174 1126
1175 7762
1176 1000
1177 7777
1178 1200

```

PAGE

```

      /CHECK THAT DONE REGISTER ALONE WILL NOT CAUSE
      /AN INTERRUPT.
      SETUP
      CLA CLL
      TAD (ERR9
      DCA RETURN
      CAP (4000
      TAD (4000
      DILE
      ION
      NOP
      IOF
      JMP .+4
      ERROR
      CLT9
      CLT10=1
      ISZ
      JMP
      /CHECK THAT DONE AND INTERRUPT ENABLE WILL CAUSE AN
      /INTERRUPT.
      SETUP
      CLA CLL
      TAD (OK10
      DCA RETURN
      CAP (0001
      DIXY
      DILE
      ION
      NOP
      IOF
      ERROR
      CLT10
      CLT11=1
      ISZ
      JMP
      /CHECK THAT DILX WILL CLEAR DONE.

```

```

1200 4025
1201 7300
1202 1377
1203 3002
1204 6007
1205 1376
1206 4161
1207 6001
1208 7000
1209 6002
1210 5216
1211 4101
1212 1201
1213 1220
1214 2005
1215 5201
1216
1217

```

```

1220 4025
1221 7300
1222 1375
1223 3002
1224 1374
1225 4155
1226 4161
1227 6001
1228 7000
1229 6002
1230 4101
1231 1221
1232 1237
1233 2005
1234 5221
      /GET RETURN ADDRESS;
      /SETUP RETURN ADDRESS;
      /SETUP AC TO
      /ENABLE DONE
      /AND INTERRUPT;
      /TURN INTERRUPT ON;
      /WAIT;
      /TURN INTERRUPT OFF;
      /FAILED, INTERRUPT DID NOT TAKE PLACE;
      /ERROR-SCOPE LOOP ADDRESS;
      /NEXT TEST;
      /TEST LOOP COUNTER;
      /RETURN;

```

```

1235 5221
1236

```



```

1237 4025          SETUP
1240 7300          CLA CLL
1241 1146          TAD
1242 3250          DCA
1243 1166          TAD
1244 3251          DCA
1245 4145          DILX
1246 4140          DISD
1247 5246          JMP
1250 7402          XX
1251 7402          CLT11A, XX
1252 0376          AND
1253 7450          SNA
1254 5260          JMP
1255 4101          ERROR
1256 1240          CLT11
1257 1262          CLT12=1
1260 2005          ISE
1261 5240          JMP
          TALLY
          CLT11

```

/CHECK THAT DILY WILL CLEAR DONE.

```

4025          SETUP
7300          CLA CLL
1152          TAD
3273          DCA
1166          TAD
3274          DCA
4151          DILY
4140          DISD
5271          JMP
7402          XX
7402          CLT12A, XX
0376          XX
7450          AND
5303          SNA
5303          JMP
4101          ERROR
1263          CLT12
0606          CLT1=3
2005          ISE
5263          JMP
2021          SNA
5773          JMP
5772          JMP

```

```

1372 2600
1373 2606
1374 2001
1375 1235
1376 4000
1377 1213
1400

```

//DISPLAY FOUR HORIZONTAL LINE SEGMENTS

//CHECK FOR FLYBACK TRACE

| | | | | |
|------|-------|---------|--------|---|
| 1400 | 6007 | HURTST, | CAF | SETUP FOR HORIZONTAL LINES, |
| 1401 | 4777, | JMS | MSG10 | /CHECK FOR VR=14 CHANNEL, |
| 1402 | 5404 | CLA CLL | | /DISPLAY HORIZONTAL LINE AT Y=1001 (RIGHT); |
| 1403 | 7300 | JMS | SETHOR | /NON-VARIABLE AXIS ORIGIN (Y); |
| 1404 | 4776, | JMS | SELCHN | /ROUTINE TO INCREMENT X AXIS, |
| 1405 | 4044 | CLA CLL | | /PLOT COUNTER, |
| 1406 | 7200 | TAD | (1001 | /ORIGIN OF X AXIS, |
| 1407 | 1375 | JMS | PLINE | /DISPLAY HORIZONTAL LINE AT Y=777 (RIGHT); |
| 1410 | 4774, | JMS | | /NON-VARIABLE AXIS ORIGIN (Y); |
| 1411 | 7377 | -401 | | /ROUTINE TO INCREMENT X AXIS, |
| 1412 | 1001 | 1001 | | /PLOT COUNTER, |
| 1413 | 7200 | CLA | (0777 | /ORIGIN OF X AXIS, |
| 1414 | 1373 | TAD | PLINE | /DISPLAY HORIZONTAL LINE AT Y=1001 (LEFT); |
| 1415 | 4774, | JMS | | /NON-VARIABLE AXIS ORIGIN (Y); |
| 1416 | 7377 | -401 | | /ROUTINE TO DECREMENT X AXIS, |
| 1417 | 1001 | 1001 | | /PLOT COUNTER, |
| 1420 | 7200 | CLA | (1001 | /ORIGIN OF X AXIS, |
| 1421 | 1375 | TAD | MLINE | /DISPLAY HORIZONTAL LINE AT Y=777 (LEFT); |
| 1422 | 4772, | JMS | | /NON-VARIABLE AXIS ORIGIN (Y); |
| 1423 | 7377 | -401 | | /ROUTINE TO DECREMENT X AXIS, |
| 1424 | 0777 | 0777 | | /PLOT COUNTER, |
| 1425 | 7200 | CLA | (0777 | /ORIGIN OF X AXIS, |
| 1426 | 1373 | TAD | MLINE | /DISPLAY HORIZONTAL LINE AT Y=1001 (LEFT); |
| 1427 | 4772, | JMS | | /NON-VARIABLE AXIS ORIGIN (Y); |
| 1430 | 7377 | -401 | | /ROUTINE TO DECREMENT X AXIS, |
| 1431 | 0777 | 0777 | | /PLOT COUNTER, |
| 1432 | 4036 | JMS | CKSW7 | /ORIGIN OF X AXIS, |
| 1433 | 5205 | JMP | HORFLY | /SW7=0, RETURN TO DISPATCH; |
| | | | | /SW7=1, CONTINUE IN CURRENT TEST, |

//VERTICAL LINE SEGMENT TEST

//DISPLAY FOUR VERTICAL LINE SEGMENTS

//CHECK FOR FLYBACK TRACE

| | | | | |
|------|-------|---------|--------|--|
| 1434 | 6007 | VERTST, | CAF | SETUP FOR VERTICAL LINES, |
| 1435 | 4777, | JMS | MSG9 | /CHECK FOR VR=14 CHANNEL, |
| 1436 | 5371 | CLA CLL | | /DISPLAY VERTICAL LINE AT X=1001 (UP); |
| 1437 | 7300 | JMS | SETVER | /NON-VARIABLE AXIS ORIGIN (X); |
| 1440 | 4771, | JMS | SELCHN | /ROUTINE TO INCREMENT Y AXIS, |
| 1441 | 4044 | CLA CLL | | /PLOT COUNTER, |
| 1442 | 7300 | TAD | (1001 | /ORIGIN OF Y AXIS, |
| 1443 | 1375 | JMS | PLINE | /DISPLAY VERTICAL LINE AT X=0777 (UP); |
| 1444 | 4774, | JMS | | /NON-VARIABLE AXIS ORIGIN (X); |
| 1445 | 7377 | -401 | | /ROUTINE TO INCREMENT Y AXIS, |
| 1446 | 1001 | 1001 | | /PLOT COUNTER, |
| 1447 | 7200 | CLA | (0777 | /ORIGIN OF Y AXIS, |
| 1450 | 1373 | TAD | PLINE | /DISPLAY VERTICAL LINE AT X=1001 (DOWN); |
| 1451 | 4774, | JMS | | /NON-VARIABLE AXIS ORIGIN (X); |
| 1452 | 7377 | -401 | | /ROUTINE TO DECREMENT Y AXIS, |
| 1453 | 1001 | 1001 | | /PLOT COUNTER, |
| 1454 | 7200 | CLA | (1001 | /ORIGIN OF Y AXIS, |
| 1455 | 1375 | TAD | MLINE | /DISPLAY VERTICAL LINE AT X=1001 (DOWN); |
| 1456 | 4772, | JMS | | /NON-VARIABLE AXIS ORIGIN (X); |
| 1457 | 7377 | -401 | | /ROUTINE TO DECREMENT Y AXIS, |
| | | | | /PLOT COUNTER, |

| VCORE POINT | PLOT | DISPLAY | DIAGNOSTIC | PAL10 | V141 | 22-OCT-71 | 13153 | PAGE 1-14 |
|-------------|------|---------|------------|--------|------|-----------|-------|---|
| 1460 | 0777 | 0777 | 0777 | | | | | /ORIGIN OF Y AXIS, |
| 1461 | 7200 | CLA | CLA | | | | | /DISPLAY VERTICAL LINE AT X=0777 (DOWN) |
| 1462 | 1373 | YAD | YAD | (0777 | | | | /NON-VARIABLE AXIS ORIGIN (X) |
| 1463 | 4772 | JMS | JMS | MLINE | | | | /ROUTINE TO DECREMENT Y AXIS, |
| 1464 | 7377 | -401 | -401 | | | | | /PLOT COUNTER |
| 1465 | 0777 | 0777 | 0777 | | | | | /ORIGIN OF Y AXIS, |
| 1466 | 4036 | JMS | JMS | CKSW7 | | | | /SW7=0, RETURN TO DISPATCH, |
| 1467 | 5241 | JMP | JMP | VERFLY | | | | /SW7=1, CONTINUE IN CURRENT TEST. |

```

CORIST, 6007
1001 4777'
1001 JMS MESSAGE
1002 3420 MSG11
1003 7300 CLA CLL
1004 4044 JMS SELCHN
1005 4776' JMS SETVER
1006 7300 CLA CLL
1007 1375 TAD (1001
1010 4774' JMS PLINE
1011 7577 -201
1012 1001 1001
1013 7200 CLA
1014 1373 TAD (0777
1015 4772' JMS MLINE
1016 7577 -201
1017 0777 0777
1020 7200 CLA
1021 1375 TAD (1001
1022 4772' JMS MLINE
1023 7577 -201
1024 0777 0777
1025 7200 CLA
1026 1373 TAD (0777
1027 4774' JMS PLINE
1030 7577 -201
1031 1001 1001
1032 4771' JMS SETHOR
1033 7200 CLA
1034 1373 TAD (0777
1035 4774' JMS PLINE
1036 7577 -201
1037 1001 1001
1040 7200 CLA
1041 1375 TAD (1001

```

```

/VCSB POINT PLOT DISPLAY DIAGNOSTIC
PAL10 V141 22-001-71 13153 PAGE 1-15
PLINE /PLOT HORIZONTAL LINE AT Y=1001(RIGHT)

(0777
MLINE /PLOT HORIZONTAL LINE AT Y=777(LEFT)

(1001
MLINE /PLOT HORIZONTAL LINE AT Y=1001(LEFT)

DIAG1 /PLOT DIAGONOL LINE (LOWER LEFT)

DIAG1 /PLOT DIAGONOL LINE (UPPER RIGHT)

DIAG2 /PLOT DIAGONOL LINE (UPPER LEFT)
/X ORIGIN,
/Y ORIGIN,

DIAG2 /PLOT DIAGONOL LINE (LOWER RIGHT)

CKSW7
CORNER

PAGE
1642 4774' JMS
1643 7577 -201
1644 1001 1001
1645 7200 CLA
1646 1373 TAD
1647 4772' JMS
1650 7577 -201
1651 0777 0777

1652 7200 CLA
1653 1375 TAD
1654 4772' JMS
1655 7577 -201
1656 0777 0777
1657 7200 CLA
1660 4770' JMS
1661 7577 -201
1662 1001 1001
1663 7200 CLA
1664 4770' JMS
1665 7577 -201
1666 0577 0577
1667 7200 CLA
1670 4767' JMS
1671 7577 -201
1672 1001 1001
1673 0777 0777
1674 7200 CLA
1675 4767' JMS
1676 7577 -201
1677 0577 0577
1700 1201 1201
1701 4036 JMS
1702 5204 JMP

1767 2660
1770 2626
1771 2613
1772 2416
1773 0777
1774 2443
1775 1001
1776 2600
1777 4600
2000 2000

```

```

//ROUTINE TO DISPLAY DIAGONALS
//
DBTST, CAF
JMS MSGE
MSG19
CLA CLL
JMS SELCHN
LAS
DIABIS, JMS
LAS
/CHECK FOR VR=14 CHANNEL,
/GET S,R,

```

| VOGE POINT | PLOT | DISPLAY | DIAGNOSTIC | PAL10 | V141 | 22-001-71 | 13193 | PAGE 1-13 |
|--|------|---------|------------|---------|------|-----------------------------------|-------|-----------|
| 2006 | 0376 | AND | | (0100 | | /MASK IO CHECK SW5; | | |
| 2007 | 7640 | SZA CLA | | I+5 | | /SW5 = 0, PLOT LL TO UR DIAGONAL; | | |
| 2010 | 5215 | JMP | | DIAG1 | | /SW5 = 1, PLOT UL TO LR DIAGONAL; | | |
| 2011 | 4775 | JMS | | | | /PLOT LL TO UR DIAGONAL; | | |
| 2012 | 5777 | -2001 | | | | | | |
| 2013 | 1001 | 1001 | | | | | | |
| 2014 | 5221 | JMP | | I+5 | | /PLOT UL TO LR DIAGONAL; | | |
| 2015 | 4774 | JMS | | DIAG2 | | | | |
| 2016 | 6000 | -2000 | | | | | | |
| 2017 | 1001 | 1001 | | | | | | |
| 2020 | 0777 | 0777 | | | | | | |
| 2021 | 4036 | JMS | | CKSW7 | | /SW7=0, RETURN TO DISPATCH; | | |
| 2022 | 5204 | JMP | | DIABIS | | /SW7=1, CONTINUE PLOT; | | |
| //ROUTINE TO MOVE A VERTICAL BAR HORIZONTALLY; | | | | | | | | |
| // | | | | | | | | |
| 2023 | 6007 | VRBIST, | CAF | MESSAGE | | | | |
| 2024 | 4777 | JMS | | | | | | |
| 2025 | 3431 | MSG12 | | | | | | |
| 2026 | 7300 | CLA CLL | | | | | | |
| 2027 | 4044 | JMS | | SELCHN | | /CHECK FOR VR=14 CHANNEL; | | |
| 2030 | 4773 | JMS | | SETVER | | /SETUP FOR VERTICAL LINES; | | |
| 2031 | 7200 | CLA | | | | | | |
| 2032 | 1372 | TAD | | (=2000 | | | | |
| 2033 | 3255 | DCA | | HORCNT | | | | |
| 2034 | 1371 | TAD | | (1001 | | | | |
| 2035 | 3256 | DCA | | XVERT | | | | |
| 2036 | 7200 | CLA | | | | | | |
| 2037 | 1256 | TAD | | XVERT | | /SET UP X AXIS COUNTER; | | |
| 2040 | 4778 | JMS | | PLINE | | /SET UP X ORIGIN; | | |
| 2041 | 5777 | -2001 | | | | | | |
| 2042 | 1001 | 1001 | | | | | | |
| 2043 | 7604 | LAS | | | | | | |
| 2044 | 0376 | AND | | | | | | |
| 2045 | 7640 | SZA CLA | | (0100 | | /GER X COORDINATE; | | |
| 2046 | 5236 | JMP | | VERBAR | | /PLOT VERTICAL BAR; | | |
| 2047 | 2256 | ISE | | XVERT | | /COUNT; | | |
| 2050 | 7000 | NOP | | | | /Y COORDINATE; | | |
| 2051 | 2255 | ISE | | | | /GET S.I.R. | | |
| 2052 | 5236 | JMP | | | | /MASK BIT 5 | | |
| 2053 | 4036 | JMS | | | | /S.I.R. 5 = 0 CONTINUE LINE MOVE; | | |
| 2054 | 5223 | JMP | | | | /S.I.R. 5 = 1 HALT LINE MOVEMENT; | | |
| 2055 | 0000 | | | | | /UPDATE X COORDINATE; | | |
| 2056 | 0000 | | | | | /UPDATE X AXIS COUNTER; | | |
| 2051 | 2255 | ISE | | | | /IS PLOT COMPLETE? | | |
| 2052 | 5236 | JMP | | HORCNT | | /NO, CONTINUE; | | |
| 2053 | 4036 | JMS | | CKSW7 | | /SW7=0, RETURN TO DISPATCH; | | |
| 2054 | 5223 | JMP | | VRBIST | | /SW7=1, CONTINUE IN CURRENT TEST; | | |
| 2055 | 0000 | | | | | | | |
| 2056 | 0000 | | | | | | | |
| //ROUTINE TO MOVE A HORIZONTAL BAR VERTICALLY; | | | | | | | | |
| // | | | | | | | | |
| 2057 | 6007 | HRBIST, | CAF | MESSAGE | | | | |
| 2060 | 4777 | JMS | | | | | | |
| 2061 | 3444 | MSG13 | | | | | | |
| 2062 | 7300 | CLA CLL | | | | | | |

| | | | | |
|------|-------|--------|--------|-----------------------------------|
| 2064 | 4767' | JMS | SETHOR | /SETUP FOR HORIZONTAL LINES, |
| 2065 | 7200 | CLA | | |
| 2066 | 1372 | TAD | (=2000 | |
| 2067 | 3311 | DCA | VERCNT | /SETUP Y AXIS COUNTER, |
| 2070 | 1371 | TAD | (1001 | /SETUP Y ORIGIN, |
| 2071 | 3312 | DCA | YVERT | |
| 2072 | 7200 | CLA | | /GET Y COORDINATE, |
| 2073 | 1312 | TAD | YVERT | /PLOT HORIZONTAL BAR, |
| 2074 | 4770' | JMS | PLINE | /COUNT, |
| 2075 | 5777 | =2001 | | /X COORDINATE, |
| 2076 | 1001 | 1001 | | /GET S.I.R, |
| 2077 | 7604 | LAS | (0100 | /MASK BIT 5 |
| 2100 | 0376 | AND | | /SW 5 = 0 CONTINUE LINE MOVE, |
| 2101 | 7640 | SEA | CLA | /SW 5 = 1 HALT LINE MOVEMENT, |
| 2102 | 5272 | JMP | HORBAR | /UPDATE Y COORDINATE, |
| 2103 | 2312 | ISE | YVERT | /UPDATE Y AXIS COUNTER, |
| 2104 | 7000 | NOP | | /IS PLOT COMPLETE? |
| 2105 | 2311 | ISE | VERCNT | /NO, CONTINUE, |
| 2106 | 5272 | JMP | HORBAR | /SW700, RETURN TO DISPATCH, |
| 2107 | 4036 | JMS | CKSN7 | /SW701, CONTINUE IN CURRENT TEST, |
| 2110 | 5257 | JMP | HRBTST | |
| 2111 | 0000 | 0 | | |
| 2112 | 0000 | YVERT, | | |
| 2167 | 2613 | | | |
| 2170 | 2443 | | | |
| 2171 | 1001 | | | |
| 2172 | 6000 | | | |
| 2173 | 2000 | | | |
| 2174 | 2600 | | | |
| 2175 | 2026 | | | |
| 2176 | 0100 | | | |
| 2177 | 4000 | | | |
| 2200 | | | | |

PAGE

//SINGLE POINT PLOT TEST
//ALL COORDINANTS FROM S.R,

| | | | | | |
|------|-------|--------|-------|---------|----------------------------------|
| 2200 | 6007 | PNTST, | CAP | | |
| 2201 | 4777' | | JMS | MESSAGE | |
| 2202 | 3460 | | MSG14 | | |
| 2203 | 4777' | | JMS | MESSAGE | |
| 2204 | 3476 | | MSG15 | | |
| 2205 | 7402 | | XX | | /HALT |
| 2206 | 7604 | | LAS | | /GET X COORDINANT FROM SWITCHES, |
| 2207 | 3240 | | DCA | | /SAVE IT, |
| 2210 | 4777' | | JMS | XPOINT | |
| 2211 | 3531 | | MSG16 | MESSAGE | |
| 2212 | 7402 | | XX | | |
| 2213 | 7604 | | LAS | | /HALT |
| 2214 | 3241 | | DCA | | /GET Y COORDINANT FROM SWITCHES, |
| 2215 | 4777' | | JMS | YPOINT | |
| 2216 | 3564 | | MSG17 | MESSAGE | |
| 2217 | 4777' | | JMS | | /SAVE IT, |
| 2220 | 3602 | | MSG18 | MESSAGE | |

```

2221 7402 XX
2222 7200 SINPNT, CLA
2223 1240 TAD
2224 4145 DILX
2225 4140 DISD
2226 5225 JMP
2227 7200 CLA
2228 1241 TAD
2229 4151 DILY
2230 4140 DISD
2231 5232 JMP
2232 4155 DIXY
2233 4044 JMS
2234 4036 JMS
2235 5222 JMP
2240 0000 XPOINT, 0
2241 0000 YPOINT, 0

```

//DISPLAYED CALIBRATION TEST

```

2242 6007 CAP
2243 4777 JMS
2244 7346 MSG21
2245 3776 CLA CLL
2246 1375 DCA
2247 3774 TAD
2248 7604 DCA
2249 0373 LAS
2250 7650 AND
2251 5257 SNA CLA
2252 4772 JMP
2253 7410 JMS
2254 4771 SKP
2255 1370 JMS
2256 3326 TAD
2257 1726 DCA
2258 3003 TAD
2259 4767 DCA
2260 1003 JMS
2261 7040 TAD
2262 1366 CMA
2263 3272 TAD
2264 4765 DCA
2265 7402 JMS
2266 0000 XX
2267 4036 0000
2268 4044 JMS
2269 7704 JMS
2270 7006 LAS CLL
2271 0364 RTL
2272 1776 AND
2273 7640 TAD
2274 1776 SZA CLA

```

```

//
CAP MESSAGE
MSG21
CLA CLL CMA
DCA SWITCH
TAD (=13
DCA CALCNT
LAS (=2000
AND
SNA CLA
JMP
JMS
SKP
JMS
TAD
DCA
TAD
DCA
JMS
XX
0000
JMS
JMS
LAS CLL
RTL
AND
TAD
SZA CLA

```

```

//INITIALIZE
//SWITCH LOCATION.
//INITIALIZE
//COUNTER.
//GET S.R.
//CHECK SW1
//TO DETERMINE X OR Y AXIS.
//SW1=1, SETUP Y AXIS.
//SW1=0, SETUP X AXIS.
//INITIALIZE POINTER,
//FOR CALIBRATION PICKUP.
//PICKUP CAL VALUE.
//OUTPUT LIMITS OF LINE TO TTY.
//GET BIT
//TO DETERMINE
//LENGTH OF LINE.
//SETUP PLOT COUNTER,
//PLOT LINE.
//MODIFIED TO PLOT COUNT.
//ORIGIN OF LINE.
//CHECK TEST LOOP SWITCH.
//CHECK VR=14 CHANNEL.
//GET S.R.
//CHECK SWB
//TO SEE IF IT WAS
//CHANGED SINCE
//LAST PASS.

```

```

/VCRB POINT PLOT DISPLAY DIAGNOSTIC
2303 5265 JMP
2304 1776' TAD
2305 7040 CMA
2306 3776' DCA
2307 2326 ISZ
2310 2774' ISZ
2311 5262 JMP
2312 5247 JMP
PAL10 V141 22=007=71 13153 PAGE 1019
DISLOP /NO, CONTINUE IN PRESENT PLOT,
SWITCH /YES, RESET
SWITCH /LOCATION
PNTR2 /SWITCH,
CALCNT /INCREMENT POINTER,
DISLOP-3 /HAS PRESENT AXIS CALED OUT?
DISCAL+2 /NO, GET NEXT VALUE,
/YES, RETURN TO BEGIN OF ROUTINE,

```

```

TABLEA, 0000
2313 0000
2314 0001
2315 0003
2316 0007
2317 0017
2320 0037
2321 0077
2322 0177
2323 0377
2324 0777
2325 1777
PNTR2, 0
2326 0000

```

```

2364 0001
2365 2443
2366 7777
2367 3000
2370 2313
2371 2613
2372 2600
2373 2000
2374 0455
2375 7765
2376 0454
2377 4000
2400

```

```

PAGE
//CROSSING DIAGONALS TEST
//
CROIST, CAF MESSAGE
JMS MSG20
CLA CLL
JMS SELCHN
JMS DIAG1
-1200
1400
JMS DIAG2
-1001
1400
0400
JMS CKSW7
JMS XCROS
JMP
2400 6007
2401 4777'
2402 3642
2403 7300
2404 4044
2405 4776'
2406 7000
2407 1400
2410 4775'
2411 6777
2412 1400
2413 0400
2414 4036
2415 5204

```

```

/CHECK FOR VR=14 CHANNEL,
/PLOT LL TO UR DIAGONAL,
/COUNT,
/X AND Y ORIGINS,
/PLOT UL TO LR DIAGONAL,
/COUNT,
/X ORIGIN,
/Y ORIGIN,
/SH7=0, RETURN TO DISPATCH,
/SH7=1, CONTINUE PLOT,

```


//SUBROUTINE TO DISPLAY A LINE (MINUS INCREMENTS)
//HORIZONTAL OR VERTICAL
//

| | | | |
|------|------|--------|---------------------------|
| 2416 | 0000 | MLINE, | |
| 2417 | 7402 | DISP3, | |
| 2420 | 7200 | | |
| 2421 | 1141 | XX | /MODIFIED TO DISPLAY IOT, |
| 2422 | 3232 | CLA | /SETUP |
| 2423 | 1156 | DCA | /SKIP ON DONE IOT, |
| 2424 | 3234 | TAD | /SETUP |
| 2425 | 1616 | DCA | /INTENSIFY IOT, |
| 2426 | 3270 | TAD I | /GET PLOT COUNT, |
| 2427 | 2216 | DCA | /SAVE IT, |
| 2430 | 1616 | ISZ | |
| 2431 | 5235 | PLTCT | |
| 2432 | 6052 | MLINE | |
| 2433 | 5232 | DISP4 | |
| 2434 | 6055 | JMP | /SKIP ON DONE, |
| 2435 | 7402 | XX | /WAIT FOR DONE, |
| 2436 | 1374 | TAD | /INTENSIFY |
| 2437 | 2270 | ISZ | /MODIFIED TO LOAD IOT, |
| 2440 | 5232 | JMP | /DECREMENT VARIABLE AXIS, |
| 2441 | 2216 | ISZ | /IS PLOT COMPLETE? |
| 2442 | 5616 | JMP I | /NO, CONTINUE PLOT, |
| | | | /YES, SETUP RETURN, |
| | | | /RETURN |

//SUBROUTINE TO DISPLAY A LINE (PLUS INCREMENTS)
//HORIZONTAL OR VERTICAL
//

| | | | |
|------|------|--------|-------------------------------|
| 2443 | 0000 | PLINE, | |
| 2444 | 7402 | DISP1, | |
| 2445 | 7200 | | |
| 2446 | 1141 | XX | /MODIFIED TO DISPLAY IOT, |
| 2447 | 3257 | CLA | /SETUP |
| 2450 | 1156 | DCA | /SKIP ON DONE IOT, |
| 2451 | 3261 | TAD | /SETUP |
| 2452 | 1643 | DCA | /INTENSIFY IOT, |
| 2453 | 3270 | TAD I | /GET PLOT COUNT, |
| 2454 | 2243 | DCA | /SAVE IT, |
| 2455 | 1643 | ISZ | |
| 2456 | 5262 | PLTCT | |
| 2457 | 6052 | MLINE | |
| 2460 | 5257 | DISP2 | |
| 2461 | 6055 | JMP | /GET ORIGIN OF VARIABLE AXIS, |
| 2462 | 7402 | XX | /SKIP ON DONE, |
| 2463 | 7001 | IAC | /WAIT FOR DONE, |
| 2464 | 2270 | ISZ | /INTENSIFY |
| 2465 | 5257 | JMP | /MODIFIED TO LOAD IOT, |
| 2466 | 2243 | ISZ | /INCREMENT VARIABLE AXIS, |
| 2467 | 5643 | JMP I | /IS PLOT COMPLETE? |
| | | | /NO, CONTINUE PLOT, |
| | | | /YES, SETUP RETURN, |
| | | | /RETURN |

2470 0000 PLOTCT, 0
2574 7777

2575 2660
2576 2626
2577 4600

//SUBROUTINES TO HANDLE OUTPUTS TO TTY//

| | | | | |
|------|------|-----------|----------|----------|
| 3000 | 0000 | CALSND, 0 | JMS | SIXTY |
| 3001 | 4214 | | SUM1 | |
| 3002 | 0003 | | OUT1 | |
| 3003 | 3006 | | JMS | MASAGE |
| 3004 | 4777 | | 3736 | |
| 3005 | 3736 | | 7777 | |
| 3006 | 7777 | OUT1, | 7777 | |
| 3007 | 7777 | | 4040 | |
| 3010 | 4040 | | 0000 | |
| 3011 | 0000 | | ION | |
| 3012 | 0001 | | JMP I | CALSND |
| 3013 | 5600 | | | |
| 3014 | 0000 | SIXTY, | 0 | |
| 3015 | 7000 | | NOP | |
| 3016 | 7000 | | NOP | |
| 3017 | 7000 | | CLA | |
| 3020 | 1014 | | TAD I | 104 |
| 3021 | 3023 | | DCA | 102 |
| 3022 | 5024 | | JMP I | 102 |
| 3023 | 0000 | | 0 | |
| 3024 | 3026 | | SIXTY+12 | |
| 3025 | 3017 | | JMP | SIXTY+3 |
| 3026 | 1023 | | TAD I | SIXTY+7 |
| 3027 | 0376 | | AND | (0007 |
| 3030 | 3271 | | DCA | MASKA |
| 3031 | 1023 | | TAD I | SIXTY+7 |
| 3032 | 0375 | | AND | (0070 |
| 3033 | 3272 | | DCA | MASKB |
| 3034 | 1023 | | TAD I | SIXTY+7 |
| 3035 | 0374 | | AND | (700 |
| 3036 | 3273 | | DCA | MASKC |
| 3037 | 1023 | | TAD I | SIXTY+7 |
| 3040 | 0373 | | AND | (7000 |
| 3041 | 3274 | | DCA | MASKD |
| 3042 | 1273 | | TAD | MASKC |
| 3043 | 7112 | | RTR CLL | |
| 3044 | 7010 | | RAR | |
| 3045 | 1274 | | TAD | MASKD |
| 3046 | 7012 | | RTR | |
| 3047 | 7010 | | RAR | |
| 3050 | 1275 | | TAD | MASKD+1 |
| 3051 | 3273 | | DCA | MASKC |
| 3052 | 2214 | | ISZ | SIXTY |
| 3053 | 4224 | | JMS | SIXTY+10 |
| 3054 | 1273 | | TAD | MASKC |
| 3055 | 3023 | | DCA I | SIXTY+7 |
| 3056 | 1272 | | TAD | MASKB |
| 3057 | 7004 | | RAL | |
| 3060 | 7006 | | RTL | |
| 3061 | 1271 | | TAD | MASKA |
| 3062 | 1275 | | TAD | MASKD+1 |

| | | | |
|------|------|-----|-----------|
| 3063 | 2223 | ISE | SIXTY+7 |
| 3064 | 3623 | DCA | ! |
| 3065 | 1372 | TAD | (SIXTY+12 |
| 3066 | 3224 | DCA | SIXTY+10 |
| 3067 | 2214 | ISE | SIXTY |
| 3070 | 5614 | JMP | ! |
| 3071 | 0000 | | |
| 3072 | 0000 | | |
| 3073 | 0000 | | |
| 3074 | 0000 | | |
| 3075 | 6060 | | |

MASKA,
MASKB,
MASKC,
MASKD,
0
0
0
0
6060

PAGE

//MESSAGE LISTINGS//

MSG1, TEXT "VCBE POINT PLOT DISPLAY DIAGNOSTIC"

| | |
|------|------|
| 3200 | 3736 |
| 3201 | 2603 |
| 3202 | 7005 |
| 3203 | 4020 |
| 3204 | 1711 |
| 3205 | 1624 |
| 3206 | 4020 |
| 3207 | 1417 |
| 3210 | 2440 |
| 3211 | 0411 |
| 3212 | 2320 |
| 3213 | 1401 |
| 3214 | 3140 |
| 3215 | 0411 |
| 3216 | 0107 |
| 3217 | 1617 |
| 3220 | 2324 |
| 3221 | 1103 |
| 3222 | 3736 |
| 3223 | 0000 |
| 3224 | 3736 |
| 3225 | 1501 |
| 3226 | 1116 |
| 3227 | 0405 |
| 3230 | 2355 |
| 3231 | 7005 |
| 3232 | 5504 |
| 3233 | 6603 |
| 3234 | 0237 |
| 3235 | 3600 |

MSG2, TEXT "MAINDEX=8E=0608"

/VCSE POINT PLOT DISPLAY DIAGNOSTIC PALID V141 22-0CT-71 13193 PAGE 1-26

"S,R,7=1, PERFORM TEST SELECTED BY S,R, 8-11-1"

MSG3, TEXT

3236 3736
3237 2356
3240 2256
3241 6775
3242 6154
3243 4820
3244 0522
3245 0617
3246 2215
3247 4824
3250 0523
3251 2440
3252 2305
3253 1405
3254 0324
3255 0504
3256 4002
3257 3140
3260 2356
3261 2256
3262 4070
3263 5561
3264 6137
3265 5600

"S,R,7=0, RETURN TO DISPATCH ROUTINE TO GET NEXT TEST=0"

MSG4, TEXT

3266 2356
3267 2256
3270 6775
3271 6054
3272 4822
3273 0524
3274 2522
3275 1640
3276 2417
3277 4004
3280 1123
3281 2801
3282 2403
3283 1040
3284 2217
3285 2524
3286 1116
3287 0540
3288 2417
3289 4807
3292 2524
3293 4816
3294 2530
3295 2440
3296 2405
3297 2324
3298 3736
3299 0000
3302 3736

"S,SELECT TEST=0"

MSG5, TEXT

3322 3736

3323 2305
3324 1405
3325 0324
3326 4024
3327 2523
3330 2437
3331 3600

MSG6, TEXT "DC CALIBRATION TEST"

3332 3736
3333 0403
3334 4003
3335 0114
3336 1102
3337 2201
3340 2411
3341 1716
3342 4024
3343 0523
3344 2437
3345 3600

MSG7, TEXT "RAMP TEST"

3346 3736
3347 2201
3350 1520
3351 4024
3352 0523
3353 2437
3354 3600

MSG8, TEXT "CONTROL LOGIC TEST"

3355 3736
3356 0317
3357 1624
3360 2217
3361 1440
3362 1417
3363 0711
3364 0340
3365 2405
3366 2324
3367 3736
3370 0000

MSG9, TEXT "VERTICAL FLYBACK"

3371 3736
3372 2605
3373 2224
3374 1103
3375 0114
3376 4006
3377 1431
3400 2201
3401 0313
3402 3736
3403 0000

MSG10, TEXT "HORIZONTAL FLYBACK"

3404 3736
3405 1017

3406 2211
3407 3217
3410 1624
3411 2114
3412 4006
3413 1431
3414 0201
3415 0313
3416 3736
3417 0000

MSG11, TEXT "CORNERS TEST"

3420 3736
3421 0317
3422 2216
3423 0522
3424 2340
3425 2405
3426 2324
3427 3736
3430 0000

MSG12, TEXT "VERTICAL BAR TEST"

3431 3736
3432 2605
3433 2224
3434 1103
3435 0114
3436 4002
3437 0122
3440 4024
3441 0523
3442 2437
3443 3600

MSG13, TEXT "HORIZONTAL BAR TEST"

3444 3736
3445 1017
3446 2211
3447 3217
3450 1624
3451 0114
3452 4002
3453 0122
3454 4024
3455 0523
3456 2437
3457 3600

MSG14, TEXT "SINGLE POINT PLOT TEST"

3460 3736
3461 2311
3462 1607
3463 1405
3464 4020
3465 1711
3466 1624
3467 4020
3470 1417

3471 2440
 3472 2405
 3473 2324
 3474 3736
 3475 0000

MSG15, TEXT "PUT DESIRED VALUE OF X IN S,R, AND PRESS CONTINUE"

3476 3736
 3477 2025
 3500 2440
 3501 2405
 3502 2311
 3503 2205
 3504 0440
 3505 2021
 3506 1425
 3507 0540
 3510 1706
 3511 4030
 3512 4011
 3513 1640
 3514 2356
 3515 2256
 3516 4001
 3517 1004
 3520 4020
 3521 2205
 3522 2323
 3523 4003
 3524 1716
 3525 2411
 3526 1025
 3527 0537
 3530 3600

MSG16, TEXT "PUT DESIRED VALUE OF Y IN S,R, AND PRESS CONTINUE"

3531 3736
 3532 2025
 3533 2440
 3534 0405
 3535 2311
 3536 2205
 3537 0440
 3540 2601
 3541 1425
 3542 0540
 3543 1706
 3544 4031
 3545 4011
 3546 1640
 3547 2356
 3550 2256
 3551 4001
 3552 1604
 3553 4020
 3554 2205
 3555 2323

3556 4003
3557 1716
3560 2411
3561 1625
3562 0537
3563 3600

MSG17, TEXT "••SET SW731 TO LOOP IN TEST"

3564 3736
3565 2305
3566 2440
3567 2327
3570 6775
3571 6140
3572 2417
3573 4814
3574 1717
3575 2040
3576 1116
3577 4024
3580 0523
3581 2400

MSG18, TEXT "••SET SW730 TO PLOT POINT ONCE, PRESS CONTINUE••"

3582 3736
3583 2305
3584 2440
3585 2327
3586 6775
3587 6840
3588 2417
3589 4820
3592 1417
3593 2440
3594 2017
3595 1116
3596 2440
3597 1716
3598 0305
3599 2440
3600 2022
3601 0523
3602 2340
3603 0317
3604 1624
3605 1116
3606 2305
3607 3736
3608 0000

3633 3736
3634 0411
3635 0107
3636 1716
3637 0114
3638 2337
3639 3600

MSG19, TEXT "••DIAGONALS••"

MSG01, TEXT "CROSSING DIAGONALS"

3642 3736
3643 3322
3644 1723
3645 2311
3646 1687
3647 4884
3650 1101
3651 0717
3652 1681
3653 1423
3654 3736
3655 0000

MSG21, TEXT "DISPLAYED CALIBRATION TEST"

3656 3736
3657 0411
3660 2320
3661 1401
3662 3105
3663 0440
3664 0301
3665 1411
3666 0222
3667 0124
3670 1117
3671 1640
3672 2485
3673 2324
3674 3736
3675 0000

//CONTROL LOGIC ERROR MESSAGES//

MSG1, TEXT "CLT1-DILE FAILED TO CLEAR AC"

3676 3736
3677 0314
3700 2461
3701 5504
3702 1114
3703 0540
3704 0601
3705 1114
3706 0504
3707 4024
3710 1740
3711 2314
3712 0501
3713 2240
3714 0103
3715 3736
3716 7000

MSG1A, TEXT "CLT1A-CHANNEL F/F NOT SET OR NOT READ BACK"

3717 3736
3720 0314

3721 2461
3722 0155
3723 7310
3724 0116
3725 1605
3726 1440
3727 0657
3730 0640
3731 1617
3732 2440
3733 2305
3734 2440
3735 1722
3736 4016
3737 1724
3740 4022
3741 0501
3742 0440
3743 0201
3744 0313
3745 3736
3746 0000

EMSG10, TEXT "0-0CL11B=INTERUPTI ENABE NOT SET OR NOT READ BACK0-0"

3747 3736
3750 0314
3751 2461
3752 0255
3753 1116
3754 2405
3755 2222
3756 2520
3757 2440
3760 0516
3761 0102
3762 1405
3763 4016
3764 1724
3765 4023
3766 0524
3767 4017
3770 2240
3771 1617
3772 2440
3773 2205
3774 0104
3775 4002
3776 0103
3777 1337
4000 3600

EMSG10, TEXT "0-0CL11C=CHANNEL F/F NOT SET OR NO READ BACK0-0"

4001 3736
4002 3314
4003 2461
4004 2355
4005 2310

4006 0116
 4007 1605
 4010 1440
 4011 0657
 4012 0640
 4013 1617
 4014 2440
 4015 2305
 4016 2440
 4017 1722
 4020 4016
 4021 1724
 4022 4022
 4023 0501
 4024 0440
 4025 0201
 4026 0313
 4027 3736
 4030 0000

MSG2, TEXT "CLT2-DILE FAILED TO CLEAR ENABLE REGISTER"

4031 3736
 4032 0314
 4033 2462
 4034 5504
 4035 1114
 4036 0540
 4037 0601
 4040 1114
 4041 0504
 4042 4024
 4043 1740
 4044 0314
 4045 0501
 4046 2240
 4047 0516
 4050 0102
 4051 1405
 4052 4022
 4053 0507
 4054 1123
 4055 2405
 4056 2237
 4057 3600

MSG3, TEXT "CLT3-DILX FAILED TO SET DONE OR CLEARED AC"

4060 3736
 4061 0314
 4062 2463
 4063 5504
 4064 1114
 4065 3040
 4066 0601
 4067 1114
 4070 1504
 4071 4024
 4072 1740

4073 2305
4074 2440
4075 0417
4076 1605
4077 4017
4100 2240
4101 0314
4102 0501
4103 2205
4104 0440
4105 0103
4106 3736
4107 0000

MSG4, TEXT

"CLT4-DILY FAILED TO SET DONE OR CLEARED AC"

4110 3736
4111 0314
4112 2404
4113 3504
4114 1114
4115 3140
4116 0601
4117 1114
4120 0504
4121 4024
4122 1740
4123 2305
4124 2440
4125 0417
4126 1605
4127 4017
4130 2240
4131 0314
4132 0501
4133 2205
4134 0440
4135 0103
4136 3736
4137 0000

MSG5, TEXT

"CLT5-DIXY FAILED TO SET DONE"

4140 3736
4141 0314
4142 2405
4143 3504
4144 1130
4145 3140
4146 0601
4147 1114
4150 0504
4151 4024
4152 1740
4153 2305
4154 2440
4155 0417
4156 1605
4157 3736

4160 0000
 4161 3736
 4162 0314
 4163 2466
 4164 5504
 4165 1103
 4166 0440
 4167 0601
 4170 1114
 4171 0504
 4172 4024
 4173 1740
 4174 0314
 4175 0501
 4176 2240
 4177 0417
 4200 1605
 4201 4006
 4202 1401
 4203 0737
 4204 3600

MSG6, TEXT "CLT6-DICD FAILED TO CLEAR DONE FLAG."

MSG7, TEXT "CLT7-DICD FAILED TO SKIP ON DONE FLAG OR CLRD FLAG."

4205 3736
 4206 0314
 4207 2467
 4210 5504
 4211 1123
 4212 0440
 4213 0601
 4214 1114
 4215 0504
 4216 4024
 4217 1740
 4220 2313
 4221 1120
 4222 4017
 4223 1640
 4224 0417
 4225 1605
 4226 4006
 4227 1401
 4230 0740
 4231 1722
 4232 4003
 4233 1422
 4234 2440
 4235 0614
 4236 0737
 4237 3600

MSG8, TEXT "CLT8-ILLEGAL INT, CAUSED BY INT, ENABLE."

4240 3736
 4241 2314
 4242 2470
 4243 5511

4244 1414
4245 0507
4246 0114
4247 4011
4250 1624
4251 5640
4252 0301
4253 2523
4254 0504
4255 4002
4256 3140
4257 1116
4260 2456
4261 4005
4262 1601
4263 0214
4264 0537
4265 3600

MSG9, TEXT "00CLT9=ILLEGAL INT, CAUSED BY DONE FLAG00"

4266 3736
4267 0314
4270 2471
4271 5511
4272 1414
4273 0507
4274 0314
4275 4011
4276 1624
4277 5640
4300 0301
4301 2523
4302 0304
4303 4002
4304 3140
4305 0417
4306 1605
4307 4006
4310 1401
4311 0737
4312 3600

MSG10, TEXT "00CLT10=INT, ENABLE AND DONE FLG DID NOT INTERRUPT00"

4313 3736
4314 0314
4315 2461
4316 6055
4317 1116
4320 2456
4321 4025
4322 1601
4323 0214
4324 5540
4325 1116
4326 7440
4327 0417
4330 1635

4331 4006
 4332 1407
 4333 4004
 4334 1104
 4335 4016
 4336 1724
 4337 4011
 4340 1624
 4341 0522
 4342 2225
 4343 2024
 4344 3736
 4345 0000

MSG11, TEXT "CLT11-DILX FAILED TO CLEAR DONE?"

4346 3736
 4347 0314
 4350 2461
 4351 6155
 4352 0411
 4353 1430
 4354 4006
 4355 0111
 4356 1405
 4357 0440
 4360 2417
 4361 4003
 4362 1405
 4363 0122
 4364 4004
 4365 1716
 4366 0537
 4367 3600
 4370 3736
 4371 0314
 4372 2461
 4373 6255
 4374 0411
 4375 1431
 4376 4006
 4377 0111
 4400 1405
 4401 0440
 4402 2417
 4403 4003
 4404 1405
 4405 0122
 4406 4004
 4407 1716
 4410 0537
 4411 3600

MSG12, TEXT "CLT12-DILY FAILED TO CLEAR DONE?"

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MESSAGE, 2 /MESSAGE TYPE=OUT ROUTINE

4600 2000

| | | | |
|------|------|-------|----------|
| 4666 | 3277 | DCA | MSRGT |
| 4667 | 1277 | TAD | MSRGT |
| 4670 | 7012 | RTR | |
| 4671 | 7012 | RTR | |
| 4672 | 7012 | RTR | |
| 4673 | 4300 | JMS | TYPEC |
| 4674 | 1277 | TAD | MSRGT |
| 4675 | 4300 | JMS | TYPEC |
| 4676 | 5265 | JMP | MASAGE+5 |
| 4677 | 0000 | 0 | |
| 4700 | 0000 | 0 | |
| 4701 | 0252 | AND | |
| 4702 | 7450 | SNA | MASK77 |
| 4703 | 5410 | JMP 1 | |
| 4704 | 1253 | TAD | 10 |
| 4705 | 7510 | SPA | M40 |
| 4706 | 5311 | JMP | 1+3 |
| 4707 | 1254 | TAD | C240 |
| 4710 | 5324 | JMP | MTPA |
| 4711 | 7001 | IAC | |
| 4712 | 7440 | SEA | 1+3 |
| 4713 | 5316 | JMP | C215 |
| 4714 | 1255 | TAD | MTPA |
| 4715 | 5324 | JMP | |
| 4716 | 7001 | IAC | |
| 4717 | 7440 | SEA | 1+3 |
| 4720 | 5323 | JMP | C212 |
| 4721 | 1256 | TAD | MTPA |
| 4722 | 5324 | JMP | C336 |
| 4723 | 1257 | TAD | |
| 4724 | 6046 | TLS | |
| 4725 | 6041 | TSP | |
| 4726 | 5325 | JMP | 1+1 |
| 4727 | 6042 | TCF | |
| 4730 | 7200 | CLA | |
| 4731 | 5700 | JMP 1 | TYPEC |

MSRGT,
TYPEC,

MTPA,

S

| | |
|------|------|
| 0171 | 4600 |
| 0172 | 0200 |
| 0173 | 7777 |
| 0174 | 0002 |
| 0175 | 0400 |
| 0176 | 0020 |
| 0177 | 5000 |

[illegible]

/VGBE POINT PLOT DISPLAY DIAGNOSTIC

PAL10

V141

22=OCI=71

13193

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| | | | | | | | |
|--------|------|--------|------|-------|------|--------|------|
| C212 | 4656 | DISP2 | 2462 | MSG12 | 3431 | SIXTY | 3014 |
| C215 | 4655 | DISP3 | 2417 | MSG13 | 3444 | START | 0200 |
| C240 | 4654 | DISP4 | 2435 | MSG14 | 3460 | SUM | 0003 |
| C336 | 4657 | DISPAT | 0216 | MSG15 | 3476 | SWITCH | 0454 |
| CAP | 6007 | DISREI | 0020 | MSG16 | 3531 | TABLE | 0434 |
| CALCNT | 0455 | DISREI | 2242 | MSG17 | 3564 | TABLEA | 2313 |
| CALIB | 0403 | DIY | 4155 | MSG18 | 3602 | TALLY | 0005 |
| CALSND | 3000 | EMSG1 | 3676 | MSG19 | 3633 | TALLYA | 0021 |
| CALIST | 0400 | EMSG10 | 4313 | MSG20 | 3642 | TEST | 0234 |
| CALY | 0412 | EMSG11 | 4346 | MSG21 | 3656 | TITLE | 0255 |
| CALY | 0036 | EMSG12 | 4370 | MSG22 | 3682 | TYPEC | 4700 |
| CKSM7 | 0611 | EMSG1A | 3717 | MSG23 | 3732 | TYPECH | 4620 |
| CLT1 | 1221 | EMSG1B | 3747 | MSG24 | 3746 | UPDVAL | 0421 |
| CLT11 | 1240 | EMSG1C | 4001 | MSG25 | 3755 | VARYCT | 2272 |
| CLT11A | 1250 | EMSG2 | 4031 | MSG26 | 3771 | VERBAR | 2036 |
| CLT11A | 1263 | EMSG3 | 4060 | MSG27 | 3803 | VERCNT | 2111 |
| CLT11A | 1273 | EMSG4 | 4110 | MSG28 | 3835 | VERPLY | 1441 |
| CLT11A | 0624 | EMSG5 | 4140 | MSG29 | 3871 | VERTST | 1434 |
| CLT11A | 0641 | EMSG6 | 4161 | MSG30 | 3903 | VERTST | 2023 |
| CLT11C | 0656 | EMSG7 | 4205 | MSG31 | 3935 | XCROB | 2404 |
| CLT12 | 0673 | EMSG8 | 4240 | MSG32 | 3967 | XDIO | 0134 |
| CLT13 | 0710 | EMSG9 | 4266 | MSG33 | 4001 | XDIO | 0130 |
| CLT14 | 1001 | ERR | 0126 | MSG34 | 4022 | XDIO | 0141 |
| CLT15 | 1035 | ERR | 1126 | MSG35 | 4044 | XDIO | 0145 |
| CLT16 | 1051 | ERRMSG | 1213 | MSG36 | 4077 | XDIO | 0151 |
| CLT17 | 1065 | ERRMSG | 0062 | MSG37 | 4101 | XDIO | 0165 |
| CLT18 | 1114 | ERRMSG | 4101 | MSG38 | 4126 | XDIO | 0140 |
| CLT19 | 1201 | ERRMSG | 0004 | MSG39 | 4155 | XDIO | 0155 |
| CLT20 | 1201 | ERRMSG | 0122 | MSG40 | 4177 | XDIO | 2240 |
| CORNER | 1604 | FAIL | 0101 | MSG41 | 4205 | XDIO | 0472 |
| CORIST | 1604 | GETBAK | 0023 | MSG42 | 4235 | XDIO | 2056 |
| CROIST | 1600 | GETVAL | 0417 | MSG43 | 4266 | XDIO | 7402 |
| CROIST | 2400 | HORBAR | 2072 | MSG44 | 4297 | XDIO | 2241 |
| CROIST | 2000 | HORCNT | 2055 | MSG45 | 4329 | XDIO | 2112 |
| DELY | 0024 | HORFLY | 1405 | MSG46 | 4360 | XDIO | |
| DIAG1S | 2004 | HORFLY | 1400 | MSG47 | 4392 | XDIO | |
| DIAGNT | 2657 | HORFLY | 2057 | MSG48 | 4424 | XDIO | |
| DIAG1 | 2626 | HORFLY | 0056 | MSG49 | 4455 | XDIO | |
| DIAG1A | 2650 | K7077 | 0320 | MSG50 | 4487 | XDIO | |
| DIAG2A | 2660 | M40 | 4653 | MSG51 | 4518 | XDIO | |
| DIAG2 | 2706 | M40 | 4660 | MSG52 | 4550 | XDIO | |
| DIAG2 | 4134 | M40 | 4692 | MSG53 | 4582 | XDIO | |
| DIAG2 | 4130 | M40 | 4724 | MSG54 | 4614 | XDIO | |
| DIAG2 | 4161 | M40 | 4755 | MSG55 | 4646 | XDIO | |
| DIAG2 | 4145 | M40 | 4787 | MSG56 | 4677 | XDIO | |
| DIAG2 | 4165 | M40 | 4819 | MSG57 | 4710 | XDIO | |
| DIAG2 | 2245 | M40 | 4851 | MSG58 | 4742 | XDIO | |
| DIAG2 | 4140 | M40 | 4883 | MSG59 | 4774 | XDIO | |
| DIAG2 | 2265 | M40 | 4915 | MSG60 | 4806 | XDIO | |
| DIAG2 | 0213 | M40 | 4947 | MSG61 | 4838 | XDIO | |
| DIAG2 | 2444 | M40 | 4979 | MSG62 | 4870 | XDIO | |

