g	GE Energy	**Functional Testing Specification**
	Parts & Repair Services *Louisville, KY*	**LOU-GED-DS3800HCVA**

Test Procedure for a DS3800HCVA card				
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DATE 7/15/2011	DATE	DATE	DATE 7/15/2011

1. SCOPE

1.1 This is a functional testing procedure for a DS3800HCVA.

2. STANDARDS OF QUALITY

2.1 Refer to the current revision of the IPC-A-610 standard for workmanship standards.

3. APPLICABLE DOCUMENTS

3.1 The following document(s) shall form part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue shall apply.
  3.1.1 Check board's electronic folder for more information

4. ENGINEERING REQUIREMENTS

4.1 Equipment Cleaning
  4.1.1 Equipment should be clean and free of debris prior to applying power unless performing an initial check. Refer to site specific SRA's for cleaning guidelines.
4.2 Equipment Inspection
  4.2.1 Equipment should be visually inspected for any defects prior to applying power. This inspection should include the following as a minimum:
    4.2.1.1 Wires - broken, cracked, or loosely connected
    4.2.1.2 Terminal strips / connectors - broken or cracked
    4.2.1.3 Components - visually damaged
    4.2.1.4 Capacitors - bloated or leaking
    4.2.1.5 Solder joints - damaged or cold
    4.2.1.6 Circuit board - burned or de-laminated
    4.2.1.7 Printed wire runs / Traces - burned or damaged

5. EQUIPMENT REQUIRED

5.1 The following equipment is required to perform the process requirements. Equipment may be substituted provided that all accuracy's and test ratios are equivalent or better.

Qty	Reference #	Description
1		FVE Module
1		See equipment section in the following page scanned test

6. Testing Process

6.1 Page 1 of scanned HCVA instruction

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HCVA1H1F.FUN

    PREFACE
    -------
    Functional verification tests for the DS3800HCVA.

    EQUIPMENT
    ---------
    Test module FVE (L-BUS).                                 FVME
    Extender card DS3800XEXA1B1A(or equiv).
    FVE switch box with ribbon cables (20 pin) and (10 pin).
    DS3800HMPJ processor card. or DS3800HMPG
    Monitor.proms "SD_86_MONITOR_RAM_TE".
    (other processors with their monitors might work as well?)
    Computer terminal (RS232C) with cable.
    Null modem DS3800HNMA1B1A (or equiv).

    SETUP
    -----
    Connect FVE switch box JG to module backplane JG. Already wired.
    Setup HMPJ : U22=01AA U23=02AA J1=SIG J2=L J3,J4,J5,J6=A.    can use
    Place HMPJ in module slot 1F.                                HMPG
    Connect RS232C computer terminal (CRT) to null modem JB.
    Connect null modem JA to HMPG JB.
    Set null modem berg-jumper to "SPEC".
    Set CRT baud rate to any of the following speeds:
         300 600 1200 2400 4800 9600 19200
    If using DS3800HMPG, place in module slot 1F (this is the only processor card area.
    Set HCVA berg jumpers :
         J1A/B, J2A/B      "V"
         J3                "RUN"
         J4, J5            "S"
         J8-JC             "T"
         JD                "F"
         INH1, INH2        "OUT"
    Plug HCVA into module slot 1B.
    Connect FVE switch box JA to HCVA JA (10 pins). Already wired
    Close HCVA PA02 to DCOM.
    Close HCVA PA65 to DCOM.
                               Check +/- 15 V on DC to DC converter (U16,U15)
    TEST PROCEDURE = Connect JE on backplane to JA on card
    --------------
    There are four commons on the HCVA. They are DCOM, ACOM, X1, & X2.
    Each measurement must be made with respect to the correct common.
    The following chart shows which common should be used:
        DCOM (Pin 12 U17)    ACOM (Pin 4 U14)   X1 (TP3)      X2 (TP9)
        =============        ==========        ========      ========
        Logic levels         U14 PIN 6         TP1           TP7
                             PA78              TP2           TP8
                             JA2               JA6
                             CR51 ANODE        CR53 ANODE
    Turn power on.
    Adjust R120 for as close to +10.000 VDC as possible at U14-6.
            (MUST BE WITHIN 8 MILLIVOLT)                        (ACOM)
    Remove berg jumpers J1A, J1B, J2A, & J2B.
    Short J1A "I" post to J1B "I" post.
    Short J2A "I" post to J2B "I" post.
    Cliplead across C100. CR61 must be on. (lit)
    Cliplead across C101. CR60 must be on. (lit)
        Leave clipleads on
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6.2 Page 2 of scanned HCVA instruction


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                              U15 pin 2      U15 pin 4
Measure voltage between DCOM(U15.2) & X1(U15.4). Must be less than
      +/-.80 VDC. If fails then replace U15.
Measure voltage between DCOM(U16.2) & X2(U16.4). Must be less than
      +/-.80 VDC. If fails then replace U16.
Measure voltage between DCOM & ACOM(C20-). Must be less than
      +/-.80 VDC.                                        (TP3)
Adjust R122 for 0.000+/-.002 VDC at TP1(X1.)(Adjust as close as
      possible to 0.0)                    (TP9)
Adjust R121 for 0.000+/-.002 VDC at TP7(X2.)(Adjust as close as
      possible to 0.0)
Remove clipleads from across C100 & C101.
Put berg jumpers back in the "V" position.

Using the output word command (EXAMPLE: OW9F00,data) output data
to the addresses listed below and verify the voltmeter readings.
            (Type two "B" to initialize HMPF MONITOR program)

ADDRESS  DATA         TP2-X1              JA2-X1
-------  ----     --------------      ----------------
9F00     0000     -0.010 +0.010       -0.025 +0.025    ← Example OW9F00, 0000 Enter
9F00     3FFE     -4.990 -5.010       +4.975 +5.025
9F00     7FFE     -9.985 -10.015      +9.975 +10.025

ADDRESS  DATA         TP8-X2              JA6-X2
-------  ----     --------------      ----------------
9F02     0000     -0.010 +0.010       -0.025 +0.025
9F02     3FFE     -4.990 -5.010       +4.975 +5.025
9F02     7FFE     -9.985 -10.015      +9.975 +10.025

Output data 3FFF at address 9F00 & data 7FFF at address 9F02
 and verify the proper dc output voltage at PA78 for each of the
 logic input conditions listed in the following table:
   (all outputs must be +/-1%)


                   INPUTS                OUTPUTS
        ================================ ========
PA63    PA44    PA37    PA65    PA78  →  USE ACOM as common
----    ----    ----    ----    ----
0       0       0       1       -5V
0       0       1       1       -5V
0       1       0       1       +2.8V
0       1       1       1       +4.6V
1       0       0       1       -10V
1       0       1       1       -10V
1       1       0       1       +5.6V
1       1       1       1       +9.9V
(0=closed to DCOM, 1=open from DCOM)

Output data 7FFF to address 9F00 & 9F02. (OW9F00,7FFF + OW9F02,7FFF)
Disconnect all JA connections (pull plug).
Change jumpers INH1 & INH2 from "OUT" to "IN". → PA02 = 0
Verify both relays & both LED'S cycle ON for about 1/5 sec and
 then off for about 10 to 20 sec.
   (the two circuits might not cycle synchronous)

Open PA02 from DCOM.
The relay & LED cycling should discontinue with LEDS remaining off.
Close PA02 to DCOM and reconnect JA connector.
Output data 05FF to address 9F00 and 9F02.
Verify +5.0 +/-.5V at both CR51 anode and CR53 anode.
              (Acom)                        (TP3)
SEAL THE POTS    R120, R121, R122
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6.3 Be sure to seal all potentiometers

6.4 ******TEST COMPLETE ******

7. Attachments

7.1 Troubleshooting section.

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TROUBLE SHOOTING INFORMATION
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U1 and U18 combination can be verified as follows:
Connect voltmeter to U18.6(+) ACOM(-). Output the data to address
9F00 and verify the voltmeter reading. (OW9F00,data,data,data,etc.)

U2 and U19 combination can be verified as follows:
Connect voltmeter to U19.6(+) ACOM(-). Output the data to address
9F02 and verify the voltmeter reading. (OW9F02,data,data,data,etc.)

There is no adjustment(assuming that R120 is set properly).
If the output does not change when the data is changed then the
D/A chip is probably bad or the module wiring and/or the
processor(HMPF) card.

DATA     OUTPUT(ideal)
----     -------
0000       0.0000
0002     -00.0012
0006     -00.0024
000E     -00.0048
001E     -00.0097
003E     -00.0195
007E     -00.0390
00FE     -00.0781
01FE     -00.1562
03FE     -00.3125
07FE     -00.6250
0FFE     -01.2500
1FFE     -02.5000
3FFE     -05.0000
7FFE     -10.0000
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