GE Canada
Electronic Products Repair

Test Instructions for

0621L0464_G001
Device Number

Master Multi Opto Armature I/F
Description of Device

Originated By: Lucio Carrescia
Typed Name

Date: April 6, 2006
mm/dd/yy

Approved By: Dennis Culf
Signature

Approval Date: April 6, 2006
mm/dd/yy

TEST INSTRUCTIONS
PREVIOUS REVISION SHEET

0621L0464 G001
Device Number
Master Multi Opto Armature I/F
Description of Device

Originated By	Date mm/dd/yy	Description of change
Don Cleveland	04/24/93	Created Test Instruction
Carmine Sebastiani	12/19/94	Modified Instruction since some of the jigs were not available
Rogerio Cordeiro	01/07/05	Added upgrade information
Lucio Carrescia	04/06/06	Added missing information and changed to new format.

TEST INSTRUCTIONS

Location: Book or file File

Master Multi Opto Armature I/F
0621L0464 G001
Date: April 6, 2006

1. PURPOSE:

   a. Static test procedures for Master Multi Opto Armature I/F 0621L0464 G001

2. ELEMENTARY:

   a.

3. EQUIPMENT:

   a. SP3200 Lambda Power Supply TL # 00546 (GC09D) or equivalent.
   b. +15V Power Supply TL#00199 or equivalent.
   c. 51 Pin Standard Jig TL#00199 or equivalent.
   d. Dual Anatek Supply (50V, 1A) TL#00199 or equivalent.
   e. DVM HP 34401A TL#00321 or equivalent.
   f. Oscilloscope Tektronix 2440 TL#00145 or equivalent.
   g. 12 1-foot Fiber optic Cables TL#00660
   h. 50 Pin Ribbon Cable TL#00377 (GC02D) or equivalent.
   i. 2 10K resistor 177A1460P223
   j. 1 200K Resistor 177A1460P349
   k. 1 270 Resistor 177A1001P035
   l. Temperature sensor jig TL#00859 or use 1KΩ resistors

   M 20 VET 2 TM1002

4. SET UP:

   a. Connect the SP3200 Lambda Power Supply to the JP plug.
   b. Connect JA cable to the 51 Pin jig. Connect +15V (TP16) to JA1 and tie all the commons together.
   c. Connect CP25 to J2 (ACOM to DCom).
   d. Install 10kΩ resistor on SC1 / SC2 (R250) and SC5 / SC6 (R252).
   e. Install 200kΩ resistor on SC7 / SC8 (R253).
   f. Install 270 resistor on SC11 / SC12 (R255).

5. PROCEDURE:

   a. **Power Supply:**
      i. +15 V at TP16
      ii. + 5 V at TP17
      iii. -15 V at TP18

   b. **Optical Gate Pulse Generation:**
      i. Ground the following points:

JA	LIGHTS	JA	LIGHTS
2	OE 1, 2	14	OE 13, 14
4	OE 3, 4	16	OE 15, 16

6	OE 5, 6	18	OE 17, 18
8	OE 7, 8	20	OE 19, 20
10	OE 9,10	22	OE 21, 22
12	OE 11,12	24	OE 23, 24

c. **Conduction State Sensors:** Short J 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24 to Ground.

i. Connect 12 fiber cables from the even side of the OE to the 12 OD connectors. LA1 to 3 will light up. Check corresponding chart and verify that the voltage out of the TP points changes from 0 to +5V when the fiber cable to the odd OD connectors are removed.

OD	LA1	TP	OD	LA2	TP	OD	LA3	TP
1	1	1	5	1	3	9	1	5
2	2		6	2		10	2	
3	3	2	7	3	4	11	3	6
4	4		8	4		12	4	

ii. Power down all supplies. Leave all connections and fiber links in place. Move the ribbon cable from JA to JQ. Power up the Supplies.

iii. Jumper CP1 to CP2 and connect a DVM to CP1. Verify +15V.

iv. Ground the following pins - JQ26, 28, 30, 32, 34, 36.

v. LED's LA1 to LA3 are on and the voltage at CP1 is now at +0.2 V.

vi. Monitor the output at the JA connector with a scope and check corresponding JA pin goes high when the corresponding fiber is removed from the OD connector.

Remove Fiber	Scope
OD1	JA26
OD3	JA28
OD5	JA30
OD7	JA32
OD9	JA34
OD11	JA36

vii. Make sure all the fiber cables are connected to the OD Connector. Check TP1 to TP6 and verify all points are at 0V.

viii. Check chart below. Remove one OD fiber and verify the corresponding TP goes to +5V. Then Ground the corresponding J point on the card. The output should go back to 0V.

Fiber	Gnd	Gnd	DVM
OD1	J3	J21	TP1
OD3	J6	J24	TP2
OD5	J9	J27	TP3
OD7	J12	J30	TP4
OD9	J15	J33	TP5
OD11	J18	J36	TP6

ix. Check the following points for 0.34 ±0.04V.

1. J1 J4 J7 J10 J13 J16

x. Connect JQ26, 28, 30, 32, 34, and 36 to a TTL signal at 5 Hz. Scope C1 to C6 for a capacitive charge on the upward slope of the signal.

xi. Power down all supplies. Remove all JQ jumpers (JQ1 to JQ36). Move the JQ ribbon cable back to the JA plug.

d. **Bridge and Line Attenuators:**

i. Power up the SP3200 Lambda Power Supply only.

ii. Set the Anatek to +50 V, Connect the positive lead to the points shown, and check the voltage on the following:

VA (+)	Test point	Notes	Voltage
CP7	JA40, JT1, CP23		+0.984V±40mV
CP12	JA40, JT1, CP23		-0.984V±40mV
CP17	JA41, JA42, JA49, JT2	JA42 and JT2 will always be positive	+0.984V±40mV
CP22	JA41, JA42, JA49, JT2	JA42 and JT2 will always be positive	-0.984V±40mV
CP30	JA46		-0.984V±40mV
CP30	JA45		+0.984V±40mV
CP35	JA46		+0.984V±40mV
CP40	JA45		-0.984V±40mV

iii. Repeat with reverse input polarity. The result is a reverse in output polarity with the above two exceptions.

e. **Motor Current Feedback:**

i. Set Anatek (VA) to +10.0 V, and connect (+) to CP41 and (-) to CP42.

ii. Check CP43, CP57, TP12, JA47 and JA48 for +10.0 ±0.1V

iii. Reverse polarity VA, and check CP43, CP57 and JA47 for -10.0 ± 0.1V. Check TP12 and JA48 for +10.0 ±0.1V

iv. Power down VA.

f. **Temperature Sensors:**

i. Connect DVM to TP15 and check for +13.6 ±0.5V.

ii. Connect Temperature Sensor Jig (16-1K Resistors) to JTEMPA to JTEMPD.

iii. Check TP15, JA44, and JQ38 for +1.9 ±0.1V.

iv. Remove Temperature Sensor Jig.

g. **Zeners:**

i. Place a jumper from CP54 to CP56 and connect DVM to CP56. Verify 0 Volts.

ii. Set VA to 20 Volts and connect to CP53. Check voltage at CP56 to be +15.7 ±0.8V.

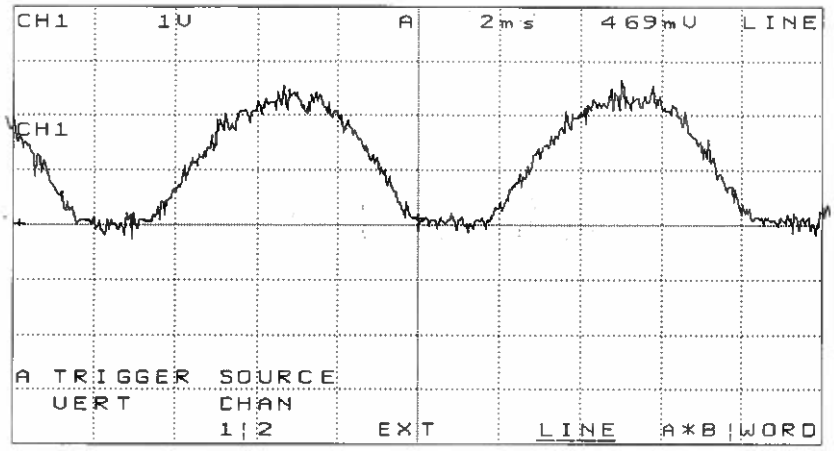
iii. Reverse polarity of VA and check CP56 is -15.7 ±0.8V.

h. **Bridge Current Feedback:**

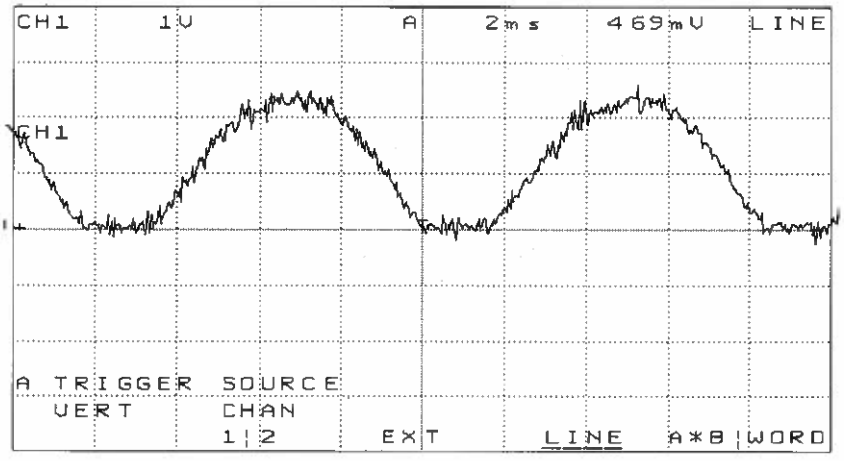
i. Connect the 20VCT transformer to the Variac. Connect the secondary of the transformer to CP44 and CP45.

ii. Connect DVM to CP50 (JT4) and scope A to TP14 (JA43).

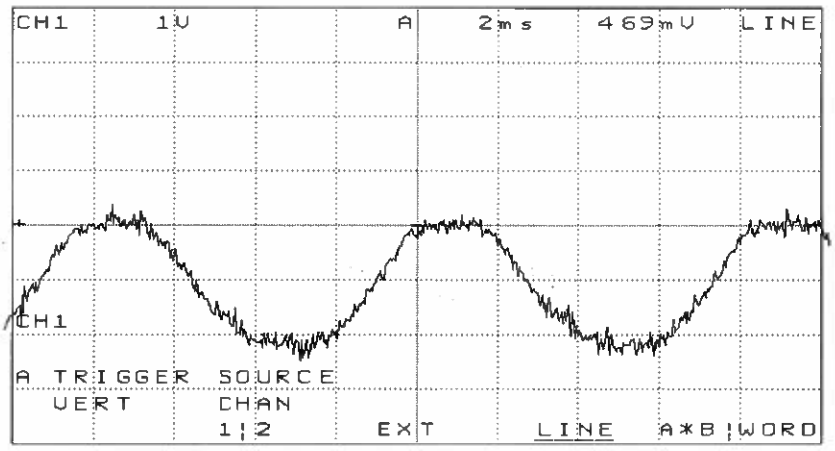
iii. Increase the voltage on the Variac until CP50 is 1.0 ±0.2V. Check TP14 and JA43 for waveform below.



iv. Move scope to CP50 and SC9 and JT4. Verify waveform below.



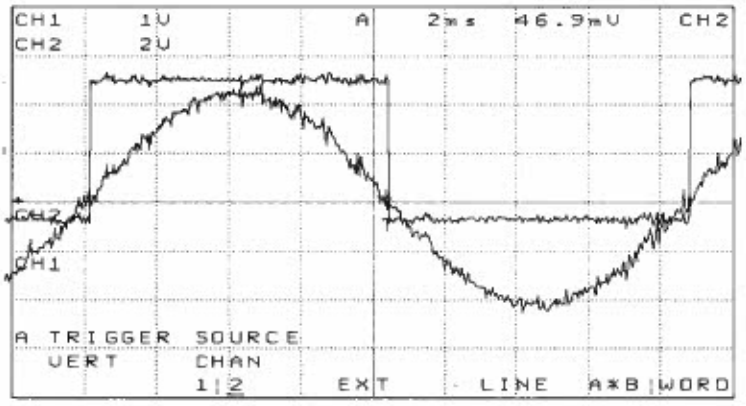
v. Ground JA50 and the waveform should invert and the CP50 is -1.0 ±0.2V. Verify waveform below.



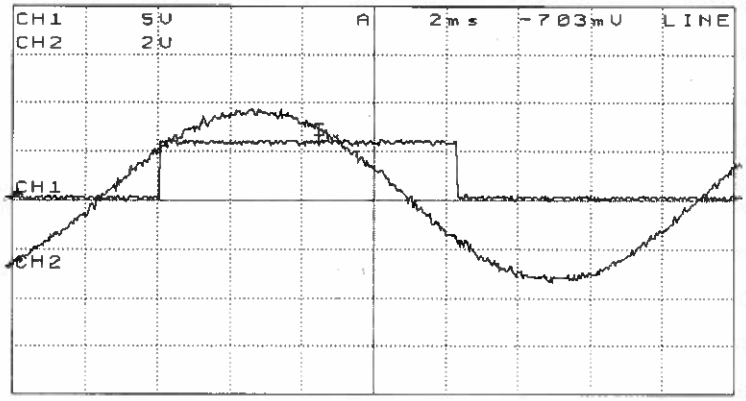
vi. Move the AC at CP44 and CP45 to CP46 and CP47 and then to CP48 and CP49. Repeat steps.

i. **PLL Input Filter:**

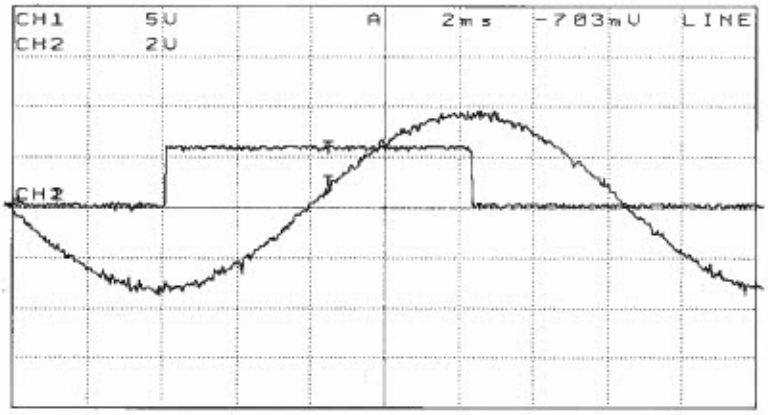
i. Connect 3 phase 115V to CP30 (L1), CP35 (L2) and CP40 (L3).
ii. Connect Scope A to TP10 and Scope B to TP11 or JA38.
iii. Verify the waveform below.



iv. Power down all supplies.
v. Move scope A to TP11 and connect scope B to JA46. Verify waveform. Reverse any two input phases if the waveforms are different from below.



vi. Move scope B to JA45. Verify waveform.



vii. Turn off all power. Remove all connections except the J2 to CP25 and leave the Lambda supply connected.

j. **Resistance:**

i. Check the following resistance.

1. CP3 - CP5 = 996kΩ
2. CP5 - CP7 = 664kΩ
3. CP8 - CP10 = 996kΩ
4. CP10 - CP12 = 664kΩ
5. CP13 - CP17 = 1.66MΩ
6. CP18 - CP22 = 1.66MΩ
7. CP26 - CP28 = 996kΩ
8. CP31 - CP33 = 996kΩ
9. CP28 - CP30 = 664kΩ
10. CP33 - CP35 = 664kΩ
11. CP36 - CP38 = 996kΩ
12. CP38 - CP40 = 664Kω

k. **Continuity Check:**

i. Check the following with respect to ground. They all should read 0 ohms
   1. J2, J5, J8, J11, J14, J17, J20, J23, J26, J29, J32, J35, CP25, CP42, CP52, CP55, CP58, JT5, JT7 and JT9.

ii. Check the following pairs for continuity.
   1. JQ26-J19, JQ28-J22, JQ30-J25, JQ32-J28, JQ34-J31, JQ36-J34, CP54-JT6, JT10-CP24-SC4, CP23-SC3 and JT8-CP51-SC10

6. UPGRADES:

a. Rev0 to Rev1
   i. Accumulation changes.
   ii. Raise all 0177A1811 P001 0.062" from card.

b. Rev1 to Rev2
   i. Cut +5V buss from R236.
   ii. Jumper +15V buss from C80 to R236 on previously cut trace.

7. END.