



GE Canada Electronic Products Repair

Test Instructions for

0621L0462 G001 and G002

Device Number

8/8 IO Card

Description of Device

Originated By: Rogério Cordeiro
Typed Name

Date: April 25, 2005
mm/dd/yy

Approved By: 
Signature

Approval Date: April 25, 2005
mm/dd/yy

TEST INSTRUCTIONS PREVIOUS REVISION SHEET

0621L0462 G001 and G002
Device Number
8/8 IO Card
Description of Device

Originated By	Date mm/dd/yy	Description of change
Carmine Sebastiani	Unknown	Created new instruction for 8/8 IO Card.
Tim Papez	02/20/95	Incorporated original , improved and added some instructions.
Tim Papez	08/22/95	Added new inspection of J115 connector (step 20), corrected step 17.
Jason Humphries	09/21/98	Modify Test Instructions
Jason Humphries	10/03/00	Modify Test Instructions
Rogério Cordeiro	November 2, 2000	Added upgraded information
Rogério Cordeiro	August 18, 2003	Created test instructions for 8/8 IO Card 0621L0462 G001 and G002
Rogério Cordeiro	August 18, 2003	Created cover and revision sheet
Rogério Cordeiro	April 25, 2005	Merged both instructions G1 and G2

TEST INSTRUCTIONS



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1. PURPOSE: To test the 8/8 IO Card card.

2. EQUIPMENT:

- a. Digital Multimeter
- b. Bench Power supplies +5VDC
- c. Tektronix Oscilloscope
- d. 51 Pin Universal Test Jig
- e. 50 Pin Flat Ribbon Cable to 51 Pin Jig Converter Jig TL # 377 or equivalent
- f. Variac *powerstat variable*
- g. Isolation Transformer (ratio not important)
- h. 115 VAC Isolated (2 phases of 3 phase connected to bench is o.k.)
- i. 2 - Function Generators
- j. 1 - 120V Relay *0359A9500 P189 use OC relay*
- k. 1 - 1K-ohm, 5%, 1/2 Watt resistor
- l. 1 - 330 ohm, 5%, 1/2 Watt resistor
- m. 1 - IAC-5 (yellow relays)
- n. 1 - OAC-5 (black relay)

3. PROCEDURES:

- a. Connect 51 Pin Universal test Jig to bench power supplies, insert 50 Pin Flat Ribbon to 51 Pin Jig Converter Jig in any slot and connect to JR on the card.
- b. Connect +5VDC to pin 24, connect COM to pin 44. Using 115VAC isolated (use isolated so there are no worries about which is line and which is neutral, thereby no sparks), connect to CPAC1 and CPAC2 respectively. Jumper CPAC1 to JX1 and connect CPAC2 to COM.
- c. Ensure all slide switches on the circuit card are set to OFF. Using digital multimeter set for ohmmeter, observe between JS49 and JR49, with switch SWCBL off, should measure ∞ ohms. With switch SWCBL on, should measure 0 Ω . Now observe between JE3 and JE4, repeat above tests with the same results.
- d. Power up AC and observe that LED 51 and LED 52 will light up. Using digital multimeter set for AC volts, observe 115VAC between CPAC3 & CPAC4, J1151 & J1152 and JZ7 & JZ9.
- e. Reconnect ribbon cable to JR. Apply DC power, using digital multimeter observe +5VDC between JE1(+) and JE2(-).
- f. Apply AC and DC voltages. Slide SWI 1 switch to the ON position, observe that the PERM relay picks up and NL1 comes on. Using digital multimeter set for AC volts, observe 115VAC between JZ2 and COM when the relay is picked up and 0VAC when the relay is dropped out. Put 120V relay coil on JZ2 and CPAC6 and verify relay picks up when SWI1 is turned on. Do the same for JZ4 and CPAC6.
- g. Turn OFF AC and DC power. Using the digital multimeter set for ohms, connect one lead to CPAC2 and the other to the following JX pins and switch the corresponding SWI switch. Should observe ∞ ohms when the SWI switch is OFF and 0 ohms when the SWI switch is ON. "Wiggle" the SWI switch is ON and ensure that it stays ON ie. there has been cases where it intermittently goes open.
 - i. JX 16 - SWI 8 JX 10 - SWI 5 JX 4 - SWI 2
 - ii. JX 14 - SWI 7 JX 8 - SWI 4
 - iii. JX 12 - SWI 6 JX 6 - SWI 3

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- h. Move ohmmeter lead from CPAC2 to CPAC1 and the other to the following JY pins and switch the corresponding SWO switch. Should observe ∞ ohms when the SWO switch is OFF and 0 ohms when the SWO switch is ON. "Wiggle" the SWO switch is ON and ensure that it stays ON ie. there has been cases where it intermittently goes open.
- | | |
|-------------------|---------------|
| i. JY 1 - SWO 1 | JY 9 - SWO 5 |
| ii. JY 3 - SWO 2 | JY 11 - SWO 6 |
| iii. JY 5 - SWO 3 | JY 13 - SWO 7 |
| iv. JY 7 - SWO 4 | JY 15 - SWO 8 |
- i. Remove the ohmmeter from the circuit and re-apply the DC power. Using the 330 ohm resistor connect to pins 3 and 5 of any input or output module sockets and ensure the LED goes on for that socket. Repeat for each socket, until all have been tested.
- j. Apply AC power, set SW1 1 to the ON position and PERM relay will pick-up and NL1 will turn ON. With the digital multimeter set to DC volts, observe 115 VDC between CP2(+) and JMC4(-). Observe 15 VDC between Z1 Cathode(+) and JMC4(-). *103V ✓* *14.9V*
- k. Ensure both I25 and O94 relays are installed, connect CP1 to CP2. Connect the 120V relay coil (not the relay on the board) to JMC1 and JMC2. Now connect JR31 to COM, LED 40 should light and the relay just connected should pick-up. When JR31 is not connected to COM the relay will drop out. With both SWMINT and SWNOM OFF, observe JR29(+) with respect to COM with the digital voltmeter. When JR31 is connected to COM, the meter will read +5VDC. When JR31 is not connected to COM the meter will also read +5VDC. Switch SWMINT and SWNOM to ON and observe LED 38 and 40 lights up with JR31 connected to COM, repeat the above tests, and this time the meter will read 0VDC when the 120V relay picks up and +5VDC when it is dropped out.
- l. Connect the N.O. contacts of the 120V relay to JMC3 and JMC4. With both SWMINT and SWNOM ON, touch JR31 to COM and note that the 120V relay picks up and stays energized even after JR31 is released from COM ie. interlocked, leave JR31 unconnected. Observe JR29 with the digital voltmeter and observe 0VDC, also note that LED 38 is lit. Slide SWMINT to OFF and observe that JR29 is now +5VDC, LED 38 is off and that the relay still remains picked-up. Slide SWNOM to OFF and the 120V relay will drop out. With both SWMINT and SWNOM OFF, re-energize the 120V relay by connecting JR31 to COM. Now release JR31 from COM and note that relay is not interlocked.
- m. Turn off AC and DC power and remove relay connections. Connect the 120V relay to JZ1 and COM. Reapply AC power and connect JR27 to COM and note that the relay picks up and that LED 37 is on. Remove JR27 from COM and note that the relay drops out and LED 37 is off.
- n. Install the 1K-ohm resistor between SC9 and SC10. Connect 21VAC using the isolation transformer and variac to JG5 and JG6. With both AC and DC power on observe SC17 and SC25 with differential scope and 100X probes. With SW1 and SW2 at the NREC position, observe the output as in FIGURE 1. With SW1 and SW2 at the REC position observe the output as in FIGURE 2.

* CONNECT SC25 to SCOPE GROUND *

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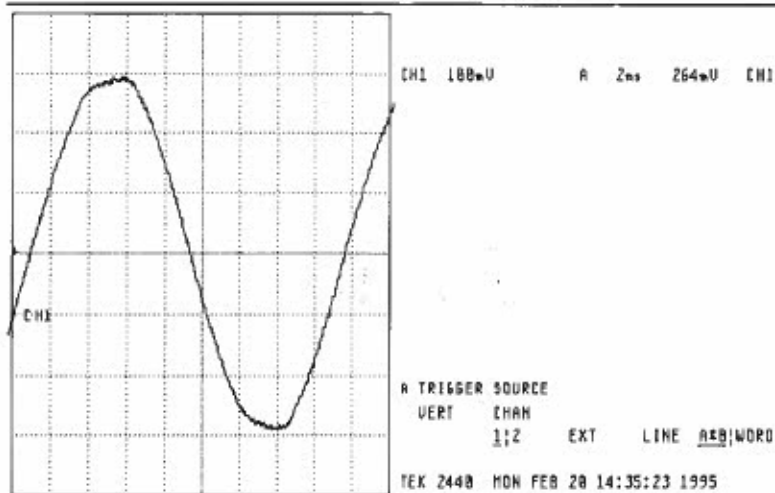


Figure 1

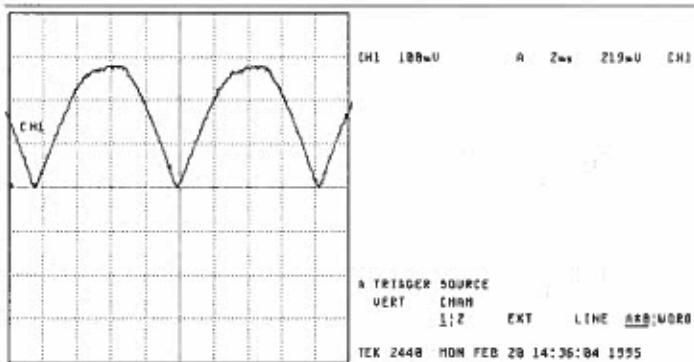


Figure 2

- o. Connect the isolated 120 VAC to CPAC1 and CPAC 2. With AC power on, measure for +15VDC between TP20(+) and TP21(-) using the DC voltmeter. Check for +5VDC between TP22(+) and TP23(-). Also check the AC ripple of these points using the oscilloscope. Note this is an isolated DC power supply so the ground of the scope will have to be moved to the appropriate points. *Several mV*

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- p. RECEIVE CHECK: Connect 60Hz square wave as illustrated in FIGURE 3 to TP30(+) and TP31(-). Using oscilloscope, monitor TP32 with respect to COM and the output should be the same as illustrated in FIGURE 4. Monitor JR21 with oscilloscope and the output will be that as illustrated in FIGURE 4. Turn off the DC power supply and the waveform on JR21 should disappear.

4.3 with Power AC 0

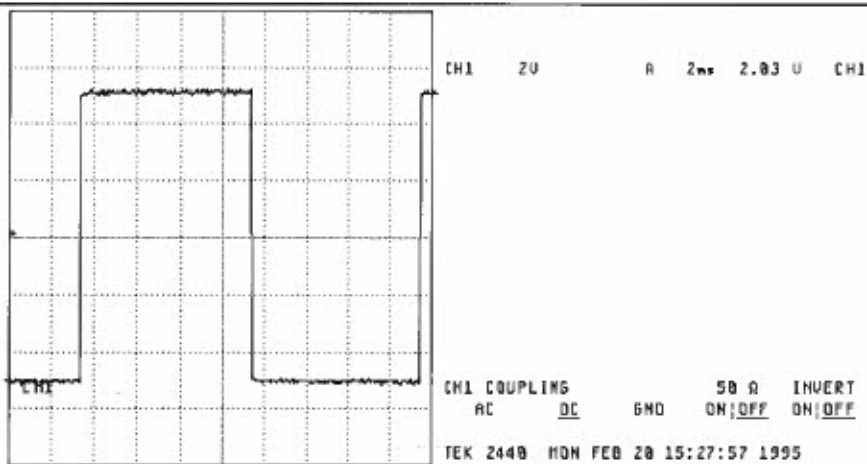


Figure 3

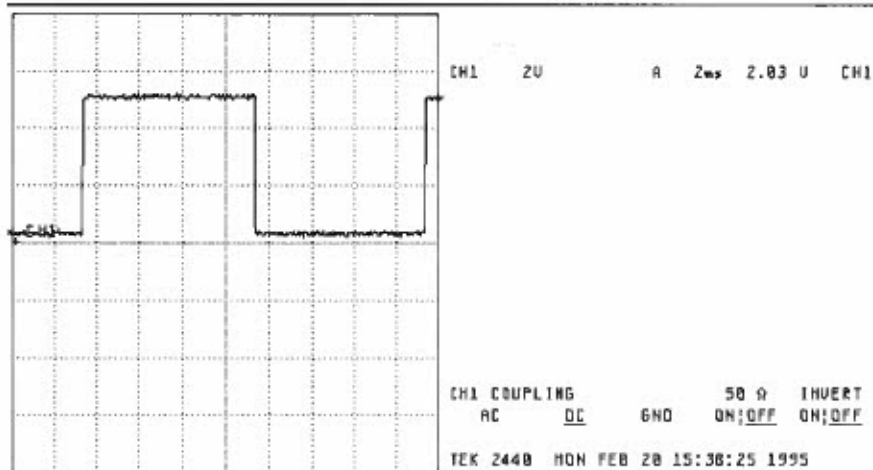


Figure 4

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- q. TRANSMIT CHECK: This procedure will require two Signal Generators set to a 5Vpp level and set DC offset to 0. Connect up both signal generators through a 392 ohm resistor. Jumper TP44 to TP31 and TP43 to CH12. The downward slope in Figure 7 is now a constant at 2.5Vdc. Set one signal generator to 100Hz as illustrated by FIGURE 5 and connect the positive lead to JR25. Set the other signal generator to 1KHz as illustrated by FIGURE 6 and connect the positive lead to JR23. Connect the Commons of the signal generators together to COM. With both AC and DC power on, move the scope ground to TP23 of the isolated power supplies and observe TP44 with the scope and observe the waveform of FIGURE 7. Observe the inverted form of TP44 on TP43.

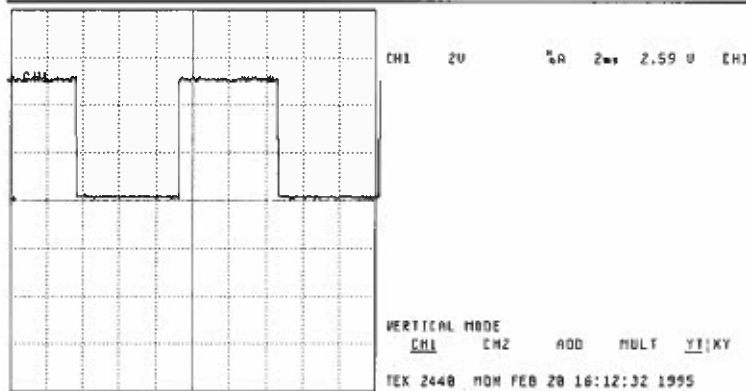


Figure 5

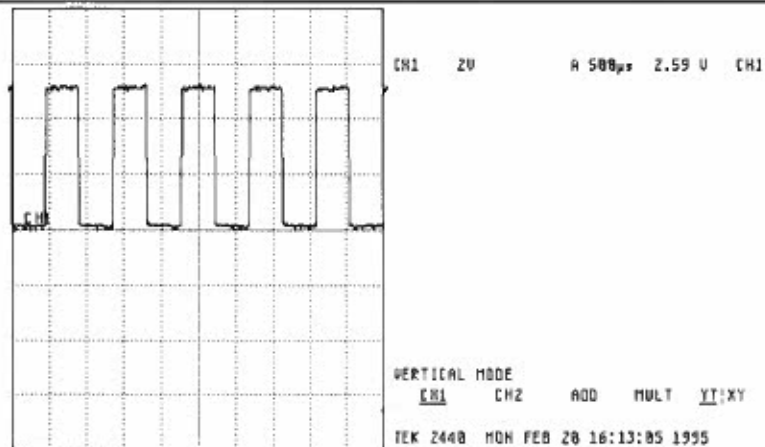


Figure 6

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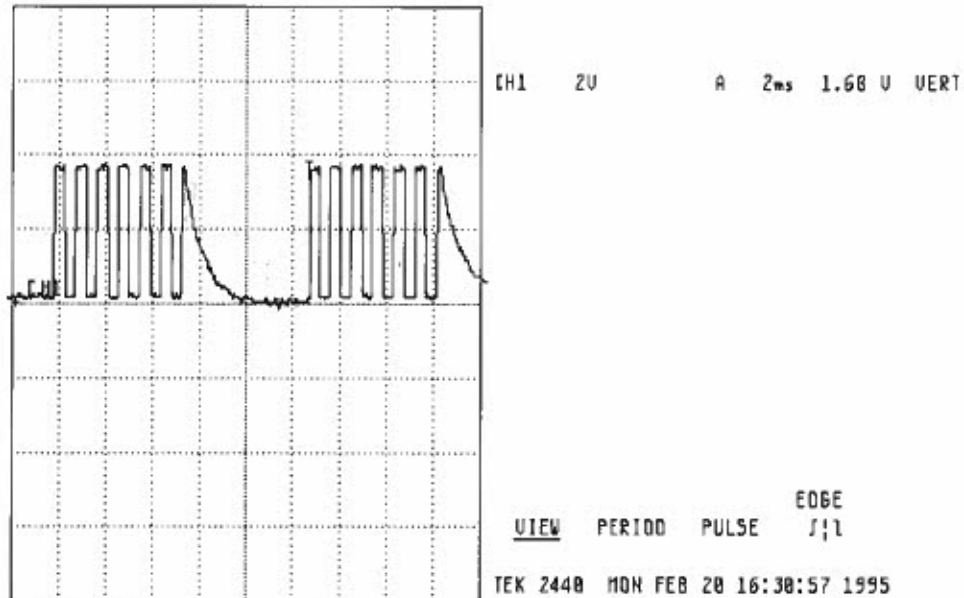


FIGURE 7.

Figure 7

- r. Turn off all power and check to see if there is 0 ohms between JV33 and JV 34 cable check for REV. 2 to 3.
- s. Check the following to be 4.99Kohms between the following:
 - i. CP10 - TP3 CP13 - TP4
 - ii. CP4 - TP5 CP11 - TP6
- t. Check for 1Kohm between the following:
 - i. CP14 - TP8 JT1 - TP14
 - ii. JT4 - TP16 JT3 - TP18
- u. Check for 0 ohms between COM and the following:
 - i. TP9, TP15, TP17, TP19
- v. Inspect J115V connector, if it is discolored in any way, replace part with new one and inform the customer that his J115V cable to this card needs to be upgraded to a new cable with the three sided female pins, thus eliminating intermittent cables that are causing this discoloration. *(make a new cable for them if this connector discolored)*

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1. PURPOSE:

- a. Static and dynamic test procedures for 8/8 IO Card 0621L0462 G001 and G002

2. ELEMENTARY:

- a. 0216B9859AA

3. EQUIPMENT:

- a. Oscilloscope Fluke PM3394B TL # 00666 or equivalent.
- b. Multi meter HP 34401A TL# 00321 or equivalent.
- c. Isolation transformer TL # 00350 or equivalent.
- d. 115/21CT VAC TL#847 TM002 or equivalent.
- e. JR/JS Interface card TL# 00888.
- f. 50 pin cable for JS.
- g. Reversible 50 pin cable for JR TL# 00593.
- h. JX/JY cable (0239A2141 P106 & 0239A2146 P006).
- i. JG cable (0239A2141 P106 & 0239A2146 P006).
- j. J115V/JMC cable (0239A2141 P101, 102 & 0239A2146 P001 & P002).
- k. JZ cable (0239A2141 P106 & 0239A2146 P006) with 115VAC relay (0177A1922SCP003).
- l. JI plug (0177A1911 P002).
- m. JLO plug (0177A1514 P114).
- n. AC1/AC2 cable.
- o. 7 IAC-5 modules for I2-I8 (0177A1976 P001) yellow if they are not part of the customer configuration.
- p. 8 OAC-5 modules for O1-O8 (0177A1978 P001) black if they are not part of the customer configuration.
- q. 2 bus bar wire jumpers for R88 & R89 if they are not part of the customer configuration.
- r. 4 4.99K resistors for R50-R53 if they are not part of the customer configuration (0177A1460 P193).
- s. Relay interface jig TL# 00836

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4. SET UP:

- a. Connect the L1 of TL#00199 to X1 of TL#00350.
- b. Connect the N of TL#00199 to X4 of TL#00350.
- c. Jumper X2 & X3 of TL#00350.
- d. Connect AC1 of UUT to H1 of TL#00350.
- e. Connect AC2 of UUT to H3 of TL#00350.
- f. Connect H1 of TL#847 TM002 to H2 of TL#00350 or equivalent.
- g. Connect H2 of TL#847 TM002 to H4 of TL#00350 or equivalent.
- h. Connect JG01 to TJ42 (JR42).
- i. Connect JG02 to TJ49 (JR49).
- j. Connect JG05 to X1 of TL#00199.
- k. Connect JG06 to CT of TL#00199.
- l. Connect the JE plug to the UUT.
- m. Connect the JG plug to the UUT.
- n. Connect the JI plug to the UUT.
- o. Connect the JJ plug to the UUT.
- p. Connect the JLO plug to the UUT.
- q. Connect the JR cable between the JR plug of the UUT and lower (parallel) plug of TL#00199.
- r. Connect the JS cable between the JS plug of the UUT and TL#00888 and insert TL#00888 in the upper (parallel) plug of TL#00199.
- s. Connect the JX/JY cable between the JX & JY plugs on the UUT.
- t. Open SW1 & SW2.
- u. Set CBL, MINT & NOM to the "OFF" position.
- v. REC/NREC to the "REC" position.
- w. Insert O1 to O8 & I2 to I8.

5. PROCEDURE:

- a. Power up
 - i. Turn on the 115VAC power source.
 1. Measure P5VDC between JR50 & JR20.
 2. Measure 9VDC between R88 & R89.
 3. Switch REC/NREC to "NREC".
 4. Measure 10VAC between R88 & R89.
 5. Measure P15VDC between TP20 (+) & TP21 or JJ09 (+) & JJ10.
 6. Measure P5VDC between TP22 (+) & TP23.

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7. ~~Observe a 100 HZ & 1KHZ signal @ JR21 & TP35.~~
- ii. Close SW2
 1. Measure 15VDC across Z1.
 2. Measure 100VDC between the anode of Z1 and the R44 (JMC side).
 3. Observe that the contactor on TL#00836 has picked up.
 4. Close SW1 & MINT.
 5. Observe that JZ relay picks up.
 6. Measure 115 VAC across the coil.
 7. Turn off the 115 VAC power source.
 8. ~~Remove all external connections from the UUT.~~

b. Continuity check

i. TP5V

1. Measure zero ohms between TP5V & JR18.
2. Measure zero ohms between TP5V & JR20.
3. Measure zero ohms between TP5V & JR24.
4. Measure zero ohms between TP5V & JR26.
5. Measure 3.32K ohms between TP5V & JS27. JR27
6. Measure 3.32K ohms between TP5V & JS29. JR29
7. Measure 3.32K ohms between TP5V & JR33.
8. Measure 3.32K ohms between TP5V & JR35.
9. Measure 3.32K ohms between TP5V & JR37.
10. Measure 3.32K ohms between TP5V & JR39.
11. Measure 3.32K ohms between TP5V & JR41.
12. Measure 3.32K ohms between TP5V & JR43.
13. Measure 3.32K ohms between TP5V & JR45.
14. Measure 3.32K ohms between TP5V & JR47.
15. Measure 3.32K ohms between TP5V & JS33.
16. Measure 3.32K ohms between TP5V & JS35.
17. Measure 3.32K ohms between TP5V & JS37.
18. Measure 3.32K ohms between TP5V & JS39.
19. Measure 3.32K ohms between TP5V & JS41.
20. Measure 3.32K ohms between TP5V & JS43.
21. Measure 3.32K ohms between TP5V & JS45.
22. Measure 3.32K ohms between TP5V & JS47.

ii. TP0V

1. Measure zero ohms between TP0V & JH19.
2. Measure zero ohms between TP0V & JH20.
3. Measure zero ohms between TP0V & JH25.
4. Measure zero ohms between TP0V & JH26.
5. Measure zero ohms between TP0V & JR19.
6. Measure zero ohms between TP0V & JR44.

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7. Measure zero ohms between TP0V & JR46.
8. Measure zero ohms between TP0V & JR48.
9. Measure zero ohms between TP0V & JR50.
10. Measure zero ohms between TP0V & TP09.
11. Measure zero ohms between TP0V & TP15.
12. Measure zero ohms between TP0V & TP17.
13. Measure zero ohms between TP0V & TP19.

iii. JE

1. Measure zero ohms between JE01 & TP5V.
2. Measure zero ohms between JE02 & TP0V.
3. Measure zero ohms between JE03 & JS49.
4. Measure zero ohms between JE04 & JR49.
5. Close CBL
6. Measure zero ohms between JE03 & JE04.
7. Measure zero ohms between JE08 & JE09.
8. Measure zero ohms between JE08 & TP115V.
9. Measure zero ohms between JE08 & CPAC03.
10. Measure zero ohms between JE08 & J115V-1.
11. ~~Measure zero ohms between JE08 & JY01.~~
12. ~~Measure zero ohms between JE08 & JY03.~~
13. ~~Measure zero ohms between JE08 & JY05.~~
14. ~~Measure zero ohms between JE08 & JY07.~~
15. ~~Measure zero ohms between JE08 & JY09.~~
16. ~~Measure zero ohms between JE08 & JY11.~~
17. ~~Measure zero ohms between JE08 & JY13.~~
18. ~~Measure zero ohms between JE08 & JY15.~~
19. Measure zero ohms between JE08 & JM01.
20. Measure zero ohms between JE08 & JM02.
21. Measure zero ohms between JE08 & CP81.
22. Measure zero ohms between JE08 & CPAC01.
23. Measure zero ohms between JE08 & CPAC05.
24. Measure zero ohms between JE10 & CPAC02.
25. Measure zero ohms between JE10 & CPAC04.
26. Measure zero ohms between JE10 & CPAC06.
27. Measure zero ohms between JE10 & J115-2.
28. ~~Measure zero ohms between JE10 & JX02.~~
29. ~~Measure zero ohms between JE10 & JX04.~~
30. ~~Measure zero ohms between JE10 & JX06.~~
31. ~~Measure zero ohms between JE10 & JX08.~~
32. ~~Measure zero ohms between JE10 & JX10.~~

OK with SW on!
many!

OK with SW on!

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- ~~33. Measure zero ohms between JE10 & JX12.~~
 - ~~34. Measure zero ohms between JE10 & JX14.~~
 - ~~35. Measure zero ohms between JE10 & JX16.~~
 36. Measure zero ohms between JE10 & JM04.
 37. Measure zero ohms between JE10 & JM05.
 38. Measure zero ohms between JE10 & JM10.
- iv. JZ
1. Measure zero ohms between JE08 & JZ05.
 2. Measure zero ohms between JE08 & JZ06.
 3. Measure zero ohms between JE08 & JZ07.
 4. Measure zero ohms between JE08 & JZ08.
 5. Measure zero ohms between JE10 & JZ09.
 6. Measure zero ohms between JE10 & JZ10.
 7. Measure zero ohms between JE10 & JZ11.
 8. Measure zero ohms between JZ03 & JZ04.
 9. Measure zero ohms between JZ12 & JM09.
 10. Measure zero ohms between JZ13 & JM07.
 11. Measure zero ohms between JZ14 & JM06.
 12. Close MINT.
 13. Measure zero ohms between JZ15 & JZ16.
- v. JG
1. Measure zero ohms between JG03 & SC01.
 2. Measure zero ohms between JG04, SC07, SC11 & JI04.
 3. Measure zero ohms between JG05 & SC06
 4. Measure zero ohms between JG06 & SC05.
 5. Measure zero ohms between JG07, TP03 & .SC27.
 6. Measure 4.99K ohms between JG07 & cp10.
 7. Measure zero ohms between JG08, TP04 & SC13.
 8. Measure 4.99K ohms between JG08 & cp13.
 9. Measure zero ohms between JG09 & SC19.
 10. Measure 4.99K ohms between JG09 & cp04.
 11. Measure zero ohms between JG10 & CP03.
 12. Measure zero ohms between JG11 & SC23.
 13. Measure 4.99K ohms between JG11 & cp11.
 14. Measure zero ohms between JG12 & CP05.
 15. Measure zero ohms between JG13 & JI12.
 16. Measure zero ohms between JG14 & JI11.
- vi. JI
1. Measure zero ohms between JI03, SC04, SC08 & SC12.
 2. Measure zero ohms between JI07 & JI08 with cp06 shorted to cp07.

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3. Measure zero ohms between JI09 & JI10 with cp08 shorted to cp09.
 4. Measure zero ohms between JI13 & JH21.
 5. Measure zero ohms between JI14 & JH22.
 6. Measure zero ohms between JI15 & JH23.
 7. Measure zero ohms between JI16 & JH24.
 8. Measure zero ohms between JI21 & JJ05.
 9. Measure zero ohms between JI22 & JJ06.
 10. Measure zero ohms between JI23 & JJ07.
 11. Measure zero ohms between JI24 & JJ08.
- vii. JJ
1. Measure zero ohms between JJ01 & JT08.
 2. Measure zero ohms between JJ02 & JT07.
 3. Measure zero ohms between JJ03 & JT05.
 4. Measure zero ohms between JJ04 & JT06.
- viii. JLI
1. Measure zero ohms between JLI01, CP12, TP30 & JLO01.
 2. Measure zero ohms between JLI02, TP31 & JLO02.
 3. Measure 100 ohms between JLI02 & CP15.
 4. Measure zero ohms between JLI06 & JLO06.
 5. Measure zero ohms between JLI07, TP43 & JLO07.
 6. Measure zero ohms between JLI08, TP44 & JLO08.
- ix. JR
1. Measure zero ohms between JR01 & JH01.
 2. Measure zero ohms between JR02 & JH02.
 3. Measure zero ohms between JR03 & JH03.
 4. Measure zero ohms between JR04 & JH04.
 5. Measure zero ohms between JR05 & JH05.
 6. Measure zero ohms between JR06 & JH06.
 7. Measure zero ohms between JR07 & JH07.
 8. Measure zero ohms between JR08 & JH08.
 9. Measure zero ohms between JR09 & JH09.
 10. Measure zero ohms between JR10 & JH10.
 11. Measure zero ohms between JR11 & JH11.
 12. Measure zero ohms between JR12 & JH12.
 13. Measure zero ohms between JR13 & JH13.
 14. Measure zero ohms between JR14 & JH14.
 15. Measure zero ohms between JR15 & JH15.
 16. Measure zero ohms between JR16 & JH16.
 17. Measure zero ohms between JR17 & JH17.
 18. Measure zero ohms between JR18 & JH18.

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19. Measure zero ohms between JR23 & TP41.

20. Measure zero ohms between JR25 & TP37.

x. JS

1. Measure zero ohms between JS01 & JV01.

2. Measure zero ohms between JS03 & JV03.

3. Measure zero ohms between JS05 & JV05.

4. Measure zero ohms between JS07 & JV07.

5. Measure zero ohms between JS09 & JV09.

6. Measure zero ohms between JS11 & JV11.

7. Measure zero ohms between JS13 & JV13.

8. Measure zero ohms between JS15 & JV15.

9. Measure zero ohms between JS17 & JV17.

10. Measure zero ohms between JS19 & JV19.

11. Measure zero ohms between JS21 & JV21.

12. Measure zero ohms between JS23 & JV23.

13. Measure zero ohms between JS25 & JV25.

14. Measure zero ohms between JS27 & JV27.

15. Measure zero ohms between JS29 & JV29.

16. Measure zero ohms between JS31 & JV31.

17. Measure zero ohms between JS02, JS04, JS06, JS08, JS10, JS12, JS14, JS16, JS18, JS20, JS22, JS24, JS26, JS28, JS30, JS32, JV02, JV04, JV06, JV08, JV10, JV12, JV14, JV16, JV18, JV20, JV22, JV24, JV26, JV28, JV30 & JV32.

xi. JT

1. Measure 1K ohms between JT01 & TP14.

2. Measure zero ohms between JT02 & CP16.

3. Measure 1K ohms between JT03 & TP18.

4. Measure 1K ohms between JT04 & TP16.

5. Measure zero ohms between JT09 & CP79.

6. Measure zero ohms between JT10 & CP78.

xii. Miscellaneous

1. Measure 1K ohms between TP08 & CP14.

2. Measure zero ohms between CP53A & CP53B.

3. Measure zero ohms between CP54A & CP54B.

TEST INSTRUCTIONS



8/8 IO Card
0621L0462 G001 and G002
Date: April 25, 2005

Location: Book or file File

Pg.: 16/16

6. UPGRADE:

a. REV1 to REV2:

- i. 0177A1127 P064 X10
- ii. Add one pin to the left of JX1 connecting to it.
- iii. Add one pin to the right of JX16 no connection.
- iv. Add one pin to the left of JY1 connecting to it.
- v. Add one pin to the right of J115 pin 2 connecting to it.
- vi. Add one pin to the left of JZ1 connecting to it.
- vii. Add one pin to the left of JM1 connecting to it.
- viii. Add one pin to the left of JG1 connecting to it.
- ix. Add one pin to the right of JG16 no connection.
- x. Add one pin to the right of JJ10 connecting to it.
- xi. Add one pin to the left of JJ1 connecting to U51-pin 8.
- xii. 0177A1127 P037 X2
- xiii. Add one stab CPAC5 in parallel to CPAC1.
- xiv. Add one stab CPAC6 in parallel to CPAC2.
- xv. 0177A1127 P037 X3
- xvi. Cut trace from T1 pin 1 to T2 pin1.
- xvii. Add one stab CP80 connecting to T1 pin 1.
- xviii. Add one stab CP81 connecting to T2 pin 1.
- xix. Add one stab CP82 connecting to the shield of T1.
- xx. Jumper CP80 to CP81.

b. REV2 to REV3:

- i. Jumper JV33 to JV34.

c. REV3 to REV4:

- i. Increase mounting whole diameter to 0.261DIA.

7. END: