g GE Energy	**Functional Testing Specification**
Parts & Repair Services ***Louisville, KY***	**LOU-GEF-RAMX1-4** **1050HL Board**

Test Procedure for RAMX1-4 Printed Circuit Board for a 1050HLX Control

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Functional test procedure for 1050HLX RAMX1-4 Printed Circuit Boards

1. SCOPE

1.1 The instructions apply to all RAMX1 44A297065-G03, RAMX2 44A297065-G01, RAMX3 44A297065-G04 RAMX4 44A297065-G02 boards in test.

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 GEK-25345 1050HLX Blue Book (Manual GEK-84814)
3.1.2 GEK-84815 Test instructions
3.1.3 GEK-25346 Board Diagrams for 1050HLX boards.
3.1.4 44C704931 RAMX1-4 Elementary

4. ENGINEERING REQUIREMENTS

4.1 Description

4.1.1 The 1050 Control is a solid-state, integrated circuit controller/processor system using LSI circuits for data processing and control. The static logic circuits are arranged on modular, plug in, printed circuit boards, clearly identified by type. The circuit boards are mounted with functional grouping. In addition, a board identification number marks each rack slot.

4.2 Equipment Cleaning

4.2.1 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.

4.3 Equipment Inspection

4.3.1 Equipment should be visually inspected for any defects prior to applying power. This inspection should include the following as a minimum:

4.3.1.1 Wires broken or cracked
4.3.1.2 Terminal strips / connectors broken or cracked
4.3.1.3 Loose wires
4.3.1.4 Components visually damaged
4.3.1.5 Capacitors leaking
4.3.1.6 Solder joints damaged or cold
4.3.1.7 Circuit board burned or de-laminated
4.3.1.8 Printed wire runs 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	GE 1050HLX # H188669	Control with axis cart # H188770

6. PURPOSE:

6.1 To describe the procedure for testing the circuitry of the RAMX1-4 boards using the 1050HLX simulator. Diagnostic Composed of 10 Sub-tests 01-09. The RAMX-x is the main memory board for the 1050HLX Control.

7. TESTING PROCESS

7.1 Diagnostic Procedure

7.1.1 First make should PROM3 Diagnostic Board is in Rack Slot 14 and connect Axis/Spindle cables to PWM Cart. X Cable to X, Spindle to Y, and Z to Z

7.1.2 Remove the test RAMX1-2 board from slot 13 or RAMX3-4 board from slot 12 and insert the board to be tested.

7.1.3 Special Mode Switch should be on (UP).

7.1.4 Press "ON".

7.1.5 Monitor should display Diagnostic Page, remove tests RS232 Port Test 04 & 05/. (tested can be removed by moving curser up or down to highlight test to be removed press **"Shift"** and **"Delete".**

7.1.6 Press **"Cycle Start"** to start testing Tests 1-09 run test for @ 1-2 hour. *** If board fails refer to GEK-84814 in 1050HLX Blue Book GEK-25345 or GEK-84815 ROM Board Diagnostics and for help continue. **If board passes go to PART PROGRM TEST 8.1.18**

7.1.7 Depress **"Shift"** and **"Clear"** to stop test.

OPTIONAL ONLY TESTS FOR TROUBLESHOOTING.

7.1.8 Test RAMX Aided Tests

7.1.9 Remove all Tests (Shift and Delete).

7.1.10 Test Sub-Test 01 for RAMX3/4 or Sub-Test 02 for RAM1/2.

7.1.11 To test Press **"SPCL1"** display in bottom left corner INSERT NO? Enter in **"10"** depress **"enter"** Subtest NO? Enter in **"01" (for RAMX3/4) "02" (for RAMX1/2)** depress **"enter"** Repeat test? Enter "**N"** then depress **"CYCLE START".** Depress **"Shift"** and **"Clear"** to stop test and Delete Sub-Test 01 (Sift and Delete) *** Refer to Diagnostic GEK-84815 page 52 for help.

7.1.12 PART PROGRAM SUPPLEMENTAL TEST

7.1.13 Sub-Test 04 for RAMX3/4 or 05 for RAMX1/2.

7.1.14 To test Press **"SPCL1"** display in bottom left corner INSERT NO? Enter in **"10"** depress **"enter"** Subtest NO? Enter in **"04" (for RAMX3/4) "05" (for RAMX1/2)** depress **"enter"** Repeat test? Enter "**N"** then depress **"CYCLE START".** Depress **"Shift"** and **"Clear"** to stop test and Delete Sub-Test 01 (Sift and Delete) *** Refer to Diagnostic GEK-84815 page 54 for help.

7.1.15 PCI SCRATCHPAD RAM SUPPLEMENTAL **TEST RAMX1/2 ONLY

7.1.16 To test Press **"SPCL1"** display in bottom left corner INSERT NO? Enter in **"10"** depress **"enter"** Subtest NO? Enter in **"07" (for RAMX1/2)** depress **"enter"** Repeat test? Enter "**N"** then depress **"CYCLE**. Depress **"Shift"** and **"Clear"** to stop test and Delete Sub-Test 01 (Sift and Delete) *** Refer to Diagnostic GEK-84815 page 55 for help.

7.1.17 DATA CONTROLLER SCRATCHPAD AND TRANSFER AREA RAM TEST ** RAMX1/2 Only

7.1.18 To test Press **"SPCL 1"** display in bottom left corner INSERT NO? Enter in **"10"** depress **"enter"** Subtest NO? Enter in **"09"** depress **"enter"** Repeat test? Enter **"N"** then depress **"CYCLE.** To stop test and Delete Sub-Test 01 (Sift and Delete *** Refer to Diagnostic GEK-84815 page 56 for help.

7.1.19 If Board passed all tests continual to Part Program Test. **Turn Off Control.**

Part Program Test

7.1.20 Remove PROM3 Diagnostic Board Slot 14 and place in PROM3 Exec Board.

7.1.21 Turn on Control

MSD must be stored in memory, Depress "**P3"** – MSD Editing Mode. Check to see if MSD is in memory if not enter it in.

MSD Program	
00	**0050 0054**
01	**0100 1000**
02	**0000 0000**
03	**1500 2525**
04	**2929 3131**
05	**1010 5066**
06	**0000 0000**
07	**0000 0000**
08	**1725 0000**
09	**2000 2500**
10	**0000 0000**
11	**0500 1500**
12	**1725 0000**
13	**0000 0000**
14	**0000 0000**
15	**0000 0000**
29	**0000 0000**

7.1.22 Turn Control Off, Switch Special Mode (UP).

7.1.23 Turn Control on

7.1.24 GOTO to Data then go to memory location 01 and add the following:

X at 01 enter 00.00

Z at 01 enter 00.00

7.1.25 Enter in PART PROGRAM

7.1.26 Depress **"PRGRAM"** Then **"SUB PG ←"** then "**Page down"**, then enter program name (like Test) depress **"enter"** then **"SUB PG →"** Enter in Program.

N10:	**G94**					
N20:	**G90**					
N30:	**G01**	**X2**	**Z2**	**F25**	**M03**	**S500**
N40:		**X-2**	**Z-2**	**F50**	**M03**	**S1000**
N50:		**X0**	**Z0**	**F75**	**M03**	**S1500**
N60:	**G04**	**X10**				
N70:	**G01**	**X2**	**Z2**	**F25**	**M04**	**S500**
N80:		**X-2**	**Z-2**	**F50**	**M04**	**S1000**
N90:		**X0**	**Z0**	**F75**	**M04**	**S1500**
N100:	**G04**	**X10**				
N110:	**G25**	**P1 30**	**P2 100**	**P3 50 to 100 cycles**		
N120:	**M30**					

7.1.27 Turn **off** Control

7.1.28 Turn Control **on**

7.1.29 Depress **"PRGRM"**

7.1.30 Depress **"SUB PG ←"**

7.1.31 Depress **"Enter"** to select program

7.1.32 Depress **"SUB PG →"** (program should be displayed)

7.1.33 Depress **"POSN"**

7.1.34 Turn on AXIS Cart and enable XYZ (Y will be the Spindle)

7.1.35 Depress **"AUTO"** then **"CYCLE START"**

7.1.36 Part Program will run as many cycles that you entered in Program Block **N110**

7.1.37 After Cycles are complete Disable X Y Z Axis and turn off Axis Cart

7.1.38 Turn Off Control and remove RAMX Board

7.2 ***TEST COMPLETE ***

8. **REFERENCE:**

8.1 None at this time