g	GE Energy Services	**Functional Testing Specification**
	Inspection & Repair Services *Louisville,KY*	**LOU–GEF-44A719337xxx**

Test Procedure for a Card

DOCUMENT REVISION STATUS: Determined by the last entry in the "REV" and "DATE" column

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release	C. Wade	11/18/04
B			
C			

PREPARED BY Charlie Wade	REVIEWED BY	REVIEWED BY	QUALITY APPROVAL
DATE 11/17/2004	DATE	DATE	DATE 11/18/04

Functional test procedure for reprogramming and testing EPM01/ERM03 boards

1. **SCOPE**

   1.1 This is a functional testing procedure for a Card.

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

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 the local documented procedures 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 or cracked
   4.2.1.2 Terminal strips / connectors broken or cracked
   4.2.1.3 Loose wires
   4.2.1.4 Components visually damaged
   4.2.1.5 Capacitors leaking
   4.2.1.6 Solder joints damaged or cold
   4.2.1.7 Circuit board burned or de-laminated
   4.2.1.8 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		MC2000 Control w/PC interface
1		MC2000 Board Programmer

6. TESTING PROCESS

6.1 Setup

6.1.1 The first assumption is the EPROM/ERM03 board is a functioning board.

6.1.2 Remove any UV stickers from EPROMs.

6.1.3 Place EPRM01/ERM03 board into board eraser and cook for at least 30 minutes or until card comes up blank in the MC2000 board programmer.

6.1.3.1 Procedure for programming card in the 2000 Board Programmer

6.1.3.2 Place master board in 2nd slot, board to be copied in any slot 3 through 17.

6.1.3.3 Berg jumpers should be the same on master card and boards that are to be programmed.

6.1.3.4 Programmer control panel

6.1.3.4.1 Buttons on left side are just indicator lights that inform the operator of current status. Buttons on right are functional and allows operator to perform specific functions. At power up, all buttons light up beginning from left moving to the right. Once unit goes through this sequence all lights go off.

6.1.3.5 Power-up and Blank Check

6.1.3.5.1 Turn bottom power supply on first, then switch on rack power supply.

6.1.3.5.2 To blank check boards, hit GREEN/BLANK check button. LEDs on the boards will go out until the programmer has found them blank, then its LED will light if blank. Any failures will cause the LED to be extinguished and red error light on the left will come on. Power down and remove any failed board.

6.1.3.6 Programming EPM01 boards

6.1.3.6.1 If you have just completed the blank tests and are ready for programming, hit the stop button on the right side. If you have just powered up and are ready to program hit the PROGRAM push button. The same is true if you have already hit the stop push button. Once the program push button is press, the programmer will prompt you for a response by lighting up the 12.5 Volt and 21 Volt Push Buttons. The type of EPROMs on the

boards will determine the voltage levels, 27128A require 12.5 volts, whereas 272128 require 21 volts. This should be readily distinguishable by the EPROM's number. It will be one or the other, no mixing of EPROMs allowed. It generally takes a little more then four hours to program a board. Once programmed cover the EPROM windows and properly label the boards.

6.1.3.7 Programming ERM03 boards.

6.1.3.7.1   If you have just completed the blank tests and are ready for programming, hit the stop button on the right side. If you have just powered up and are ready to program hit the PROGRAM push button. The same is true if you have already hit the stop push button. Once the PROGRAM push button is press the programmer will automatically set the proper voltage levels for this type of board. Come back in about four ½ hours and the board should be done. After the board is completed the red error light will come on. You have to power down, wait a few seconds, and then power up. At this time hit the VERIFY push button, this will cause all slave board's LEDs to drop out and it will begin to verify each card in rack. If board is good its green LED will light up, if not the LED will stay out and the red error light on left will come on. Label the board properly and cover the EPROM's windows with stickers. Remove power the install card into the MC2000 control with has a computer hook up.

6.2 Testing Procedure

6.2.1.1 Testing the Programmed board in its Application Environment

6.2.1.1.1   Download the specific MB3 software files onto a blank bubble board via the computer. MB3 files have to match the specific application software (check the last 6 digits on the EPM/ERM board) for control to work. Once files MB3 files are downloaded onto the bubble board power down and allow the control to come up in its application environment. If control comes up OK, enable servos and jog axis. If all axis run OK, then toggle between

status pages to verify their functionality. If OK power down. End

of test.

6.2.1.1.2   Be sure board is labeled correctly.

6.3   ***TEST COMPLETE ***

7.   NOTES