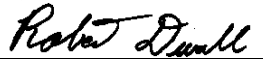| g	GE Industrial Systems	**Functional Testing Specification**
Renewal Services *Louisville,KY*		**LOU-GED-0784E668**

Test Procedure for a

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

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release, Re-write of Salem hand written document dated 8-26-74 Revision A.	R. Duvall	12/2/03
B			
C			

PREPARED BY R. Duvall	REVIEWED BY	REVIEWED BY	QUALITY APPROVAL *Robert Duvall*
DATE 12/2/03	DATE	DATE	DATE 12/2/03

1. SCOPE

1.1 This is a functional testing procedure for a MARK II Summer 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, 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		Fluke 87 DMM (or Equivalent)
1		Universal Test Kit
1		30K Load
1		5K Potentiometer

6. TESTING PROCESS

6.1 Setup

6.1.1 Set R23,R62,R66, and R35 full CW.

6.1.2 Plug card into Universal Test Kit.

6.1.3 Connect 30K load from pin 35 to Common.

6.1.4 Connect Lamp from pin 12 to Common.

6.1.5 Connect 5K Potentiometer (VP1)as follows (? To Pin 28, ? to Pin 23, ? to Pin 26, Wiper to Pin 25)

6.1.6 Set VP1 to full CW position (Dial "10" on Salem Pot)

6.1.7 Connect +30 VDC, +26 VDC, -22 VDC, and Common to Test Kit.

6.1.8 Apply Power

6.1.9 Measure across CR25T and verify a reading between +14.25 and +15.75 VDC.

6.1.10 Measure across CR26T and verify a reading between -14.25 and -15.75 VDC.

6.1.11 Apply jumper between TP6 and Common.

6.1.12 Apply 0.00 VDC at Pin 37 and Pin 39.

6.1.13 Adjust R47 for 0.000 VDC at TP13.

6.1.14 Remove Jumper between TP6 and Common.

6.2 Testing Procedure

6.2.1 Reference Verification

6.2.1.1 Verify a Measurement between +2.79 and +3.08 VDC from TP6 to COM.

6.2.1.2 Verify a Measurement between –5.54 and –6.16 VDC from TP13 to COM.

6.2.1.3 Adjust R23 full CCW.

6.2.1.4 Verify a Measurement between –0.01 and +0.01 VDC from TP6 to COM.

6.2.2 Gain Checks

6.2.2.1 Apply +1.00 VDC at Pin 37 and 0.00 VDC at Pin 39.

6.2.2.2 Verify a Measurement between –1.67 and –1.81 VDC from TP13 to COM.

✎ **Note: As input at Pin 37 is adjusted more positive the lamp remains out until TP9 reads –5.4 to –5.6 VDC. Adjusting input more positive should cause output at TP9 to clamp at –6.7 to –7.7 VDC and lamp should remain on.**

6.2.2.3 Adjust R66 for –5.2 VDC at TP13.

6.2.2.4 Adjust Load Limit Controller to Dial "0" and verify a measurement between +0.4 and +0.6 VDC at TP13.

6.2.2.5 Set Load Limit Controller to Dial "10".

6.2.2.6 Apply a Negative input at Pin 37 and verify a Measurement between +6.7 and +7.7 VDC from TP9 to COM.

6.2.2.7 Apply +30 VDC at Pin 34 and verify that Lamp illuminates.

6.2.2.8 Remove +30 VDC at Pin 34 and apply 0.00 VDC at Pin 37.

6.2.2.9 Apply +1.00 VDC at Pin 39 and verify a Measurement of at least −0.73 VDC from TP13 to COM in 8 to 14 seconds.

6.2.2.10 Allow circuit to settle and verify a Measurement between −1.11 and −1.21 VDC between TP13 and COM.

6.2.2.11 Apply 0.00 VDC to Pin 39 and −5.00 VDC to Pin 10.

6.2.2.12 Set Load Limit Controller to Dial "0".

6.2.2.13 Verify a Measurement between +4.8 and +5.2 VDC from TP13 to COM.

6.2.2.14 Jumper Pin 2 to Common.

6.2.2.15 Verify a Measurement between +3.66 and +4.06 VDC from TP13 to COM.

6.2.2.16 Remove jumper between Pin 2 and Common

6.2.2.17 Remove −5.00 VDC from Pin 10 and apply −5.00 VDC to Pin 8.

6.2.2.18 Verify a Measurement between +4.8 and +5.2 VDC from TP13 to COM.

6.2.2.19 Adjust R62 full CCW.

6.2.2.20 Verify a Measurement between −5.3 and −5.7 VDC at R58B.

6.2.2.21 Adjust R62 full CW.

6.2.2.22 Verify a Measurement between +5.3 and +5.7 VDC at R58B.

6.3 Post Testing Burn-in   **Required**   _X_ **Yes**   ___ **No**

✍   **Note:** All MARK I, II, & III Turbine related cards require a post testing burn-in of 100 hours.

6.3.1 Apply BUS or Operational power to the card for a period of 100 hours.

6.3.2 Re-test card while warm using the above procedure.

6.4 ***TEST COMPLETE ***

7. <u>NOTES</u>

7.1

8. <u>ATTACHMENTS</u>

8.1 Salem Handwritten procedure – Reference Only

MARK II — SHEET REV. A

TEST INSTRUCTIONS — SHEET 1 OF 2

SPEED SUMMER

DWG # 784E668

Rev. A.   8-26-74

TURBINE: SOUTHWEST FOREST

SERIAL NO.

BOARD NO.

SET-UP

1. SET R23, R62, R66, AND R35 full CW

2. Plug Board into Universal Test Kit.

3. Connect 30K LOAD from pin 35 to Common

4. Connect Lamp from pin 12 to common

5. Connect 5K pot (0 to pin 28, 1 to pin 23, 10 to pin 26 and slider to pin 25)

6. Set pot full CW to DIAL "10"

7. Connect +30 Voc, +26 Voc (PIN 1), -22 Voc and power supply common to test kit

8. Read CR25T (+14.25 to +15.75 Voc) _____ Voc

9. Read CR26T (-14.25 to -15.75 Voc) _____ Voc

10. Apply jumper from TP6 to Common

11. Apply 0.00 Voc at pin 37 and 39

12. Adjust ① R47 for 0.000 Voc at TP13

13. Remove jumper TP6 to Common

Reference Check

14. Read TP6 (+2.79 to +3.08 Voc) _____ Voc

15. Read TP13 (-5.54 to -6.16 Voc) _____ Voc

16. Adjust ② R23 full CCW

17. Read TP6 (-.01 to +.01 Voc) _____ Voc

GAIN CHECKS

18. Apply +1.00 Voc at pin 37 and 0.000 Voc at pin 39

19. Read TP13 (-1.67 to -1.81 Voc) _____ Voc

20. Note that as input at pin 37 is adjusted more positive the lamp remains out until TP9 reads -5.4 to -5.6 Voc.

21. Adjusting input more positive should cause output at TP9 to clamp at -6.7 to -7.7 Voc and Lamp should remain on. _____ Voc

22. Adjust ⑤ R66 for -5.2 Voc at TP13

23. Adjust Load Limit controller to DIAL "0" and check for +.4 to +.6 Voc at TP13.

TEST - INSTRUCTIONS
SPEED SUMMER
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24. Return Load Limit Control To Dial 10.

25. Apply a negative input at pin 37 and check that TP9 is clamped at +6.7 to +7.7 Voc and lamp is not Lit. ___ Voc

26. Apply +30 Voc at pin 34 checking that lamp lights

27. Remove +30 Voc from pin 34 and apply 0.000 Voc at pin 37.

28. Apply +1.00 Voc at pin 39 checking that TP13 reaches -.73 Voc ___ Voc in 8 to 14 sec's ___ Sec

29. TP13 should settle to (-1.11 to -1.21 Voc) ___ Voc

30. Apply -0.000 Voc to pin 39 and -5.00 Voc at pin 10.

31. Set Load Limit control to dial position "0" ___ Voc

32. Read TP13 (+4.8 to +5.2 Voc) ___ Voc

33. Jumper pin 2 to common ___ Voc

34. Read TP13 (+3.66 to +4.06 Voc) ___ Voc

35. Remove jumper pin 2 to common

36. Remove -5.00 Voc from pin 10 and apply -5.00 Voc to pin 8 ___ Voc

37. Read TP13 (+4.8 to +5.2 Voc) ___

38. Adjust <3> R62 full ccw ___ Voc

39. Read R58 B (-5.3 to -5.7 Voc) ___ Voc

40. Return <3> R62 full cw ___ Voc

41. Read R58 B (+5.3 Voc to +5.7Vbc) ___