

8/6/65

TMC SPECIFICATION

NO. S - 1085

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APPD:

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OF 18

TITLE:

GPT-10K-LF

SECTION I

***A. MECHANICAL INSPECTION:**

1. Check all knobs and switches on the PA frame for proper operation.
2. Check load adj. switches, coarse and fine for proper counter reading corresponding to proper switch position. Load adj. course counter should read 10 when in the clockwise position. Load adj. fine should read 10 When in a clock wise position.
3. Carefully check the PA compartment and blower box for good mechanical condition, obvious miswiring and loose connections.
4. Check power supply for loose connections and correct value of circuit components.

B. PRELIMINARY ELECTRICAL INSPECTION:

- *1. With Main Power switch OFF, check for short circuits to ground:
 - a. The 3 power input phases should read not less than 1 megohm.
 - b. The positive side of the high voltage circuit should read not less than 100K ohms with the Shorting relay contacts opened with the shorting relay contacts closed. This reading should BE ZERO.
- *2. The following units must be checked for proper termination of cables:
 - a. Relay Panel
 - b. Bias Drawer
 - c. IPA Drawer
- *3. Check complete unit for correct value of fuses.
4. Check to insure that PA output circuit is correctly connected to unbalanced output.

NOTE: Indicated completion and acceptance of portion(s) of this test preceded by (*) by recording required observed value of by ch ck () mark as required on attached test Data She t.

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- *5. Turn ON Main Power switches and observe following:
- AC Power light must go on.
 - The PA Blower must turn in the same direction as arrow stamped on the housing.
 - The bottom fan must turn counterclockwise when viewed facing the hub.
- *6. CIRCUIT FUSING CHECKS:
- With the Main Power switch OFF, remove any two of the three main blower fuses, the main blower must not run when the Main Power switch is closed. Open Main Power switch and replace the two fuses. Close Main Power switch and continue fusing circuit checks below.
 - Remove Rear Fan fuse, the Rear Fan must stop.
 - Remove the PA Filament fuse, the PA Filament voltage must be removed.
 - Remove the Timer fuse, this must deactivate the Timer.
- *7. The Filament Primary voltmeter must read the AC filament primary voltage and Filament Adjust control must vary this reading. It must be adjusted to read as closed as possible to the red mark on the voltmeter.
- *8. The PA Bias voltmeters should read between -280 and -400 volts and be adjustable by the PA Bias adjust controls on the relay panel. Set these to -Max. volts.
- *9. Set the Driver Biases to approximately -40 volts using the Driver Bias adjustments on the driver panel.
- *10. Unlatch the following overload relays and note the corresponding overload light indicator, it must light:
- | | | |
|--------------|---------------|--------|
| a. PA Plate | c. IPA Plate | e. SWR |
| b. PA Screen | d. IPA Screen | |

By pushing the Overload Reset switch on the main control panel the overload light indicators must go out and the overload relays must reset.

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- *11. The energizing of the Tune Operate lights must correspond to the position of the Tune-Operate switch. Also the Tune-Operate relay must energize and deenergize with this switch.
- *12. With the PA Screen switch in the ON position, the PA Screen relay must be deenergize with this switch.
- *13. The Filament Elapse time meter must indicate when the Filaments are ON.
- *14. Check the Time Delay relay for proper operation and time interval, between 3 and 5 minutes.
- *15. With the Alarm switch ON the alarm must sound.

C. PROTECTIVE INTERLOCK SYSTEM:

1. Before checking the interlock system insure that a jumper is connected from COM to NO (terminals 8 and 10) on E-3000 on the rear panel of the auxiliary frame.

The interlock indicator light and switch are connected in such a manner that the indicator will be ON if all interlocks are closed. To find an open interlock always turn the interlock switch to extreme counterclockwise position (IPA TEST SWITCH): rotat in clockwise direction to the position where the indicator light goes out. This is an open interlock. In cases where there is more than one interlock open the above procedure must be repeated until all interlocks are closed and all individual interlock lights are energized.

- *2. With the Main Power switch closed, ~~each~~ interlock must be checked individually by manually opening and observing the following:
 - a. The Shorting relay must release (deenergize).
 - b. The corresponding indicator light should go out.

D. HIGH VOLTAGE CHECKS:

1. With the Main Power switch closed the high voltage mercury r ctifier tubes and PA tube should have a minimum of one half hour warmup time before applying plate voltage.
2. Turn ON the High Voltage switch and check following:
 - a. As the 1st contactor is energized, the RED HV light n top of transmitter must light somewhat dimly.

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SECTION I**D. HIGH VOLTAGE CHECKS CONT'D**

- * (b) Before the 2nd contactor is energized the PA Plate voltmeter must read approximately 3.5KV.
 - * (c) The time interval between energizing of the 1st contactor and the 2nd contactor must be approximately 5 seconds.
 - * (d) After the 2nd contactor is energized the PA Plate voltmeter should read approximately 7.5 KV, and the RED HV light on top of the transmitter should be at full brightness.
- *3. The PA Screen voltmeter should read approximately 1600 volts with the Tune-operate switch in the Operate position and approximately 990 volts when in the Tune position.
 4. Placing the screen Voltage switch in the OFF position should remove the screen voltage.
 - *5. The IPA Screen voltage must change from approximately 260 volts to 150 volts as the Tune-Operate switch is moved from the Operate to Tune Position with IPA screen overload adjust pot in extreme counterclockwise position.

E. IDLING PLATE CURRENT ADJUSTMENTS:

1. With transmitter energized, blowers running, HV switch ON, Tune-Operate switch in Operate position Screen Voltage switch in ON position and S2003 Driver Drawer in normal position make following adjustments:
 - *a. Adjust both PA Bias on the relay panel to a PA Plate current reading of 1.0 ampere.
 - *b. Adjust both Driver Bias on the driver drawer for a Driver Plate current of 100 ma.

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F. CHECK OF PROTECTIVE DEVICES FOR REMOVAL OF HIGH VOLTAGES:

1. With the transmitter energized as in paragraph E above, and with the Alarm Switch in the ON position; mechanically trip Protective Devices as listed below in sequence. Each time a Protective device is mechanically tripped, the device must be reset electrically, and the HIGH VOLTAGE must be turned ON again, before testing the next PROTECTIVE DEVICE.

- *a. PA Plate overload
- *b. PA Screen overload
- *c. Zener Diode Protect relay
- *d. IPA Plate overload
- *e. IPA Screen overload
- *f. PA Bias relay (by removal of respective fuses)
- *g. SWR OVERLOAD

G. OVERLOAD ADJUSTMENTS:

*1. PA Plate overload.

- a. Turn H.V. breaker ON.
- b. Adjust both PA Bias adjusts for individual Plate Currents of 1.4 amps each. Total P.A. Plate Current should read 2.8 amps.
- c. Adjust the PA Plate overload adjust to trip at 2.8 amps.
- d. Readjust both P.A. Bias adjusts for individual Plate Currents of 1.0 amps each.

*2. PA Screen overload.

- a. Turn H.V. breaker ON.
- b. Drive the transmitter at 500 KC and vary the loading until the PA screen meter reads 60 Ma.
- c. Adjust the PA Screen overload adjust to trip at 60 Ma.
- d. Turn H.V. Breaker OFF.

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G. OVERLOAD ADJUSTMENT CONTINUED:

*3. IPA PLATE OVERLOAD

- a. Turn H.V. switch ON.
- b. Adjust both Bias adjusts until Driver Plate Current Meter reads 150 MA for Plate A and Plate B. Position "Plates" should read 300 MA + 20 MA.
- c. Adjust the IPA Plate overload adjust to trip at 300 MA.
- d. Read just both bias adjusts for a reading of 100 MA for each plate.
- e. Turn H.V. switch OFF.

*4. IPA SCREEN OVERLOAD

- a. Remove IPA Drawer from load by pulling it out on the slides.
- b. Put S-2003 of IPA Drawer in the TEST position.
- c. Short to ground PIN 2 of XV-2004 and the IPA Screen Overload should trip out.
- d. Adjust the IPA Screen Overload adjust until the relay will latch when reset.
- e. Repeat Procedure until relay will latch readily when reset.
- f. Read just both IPA Plate currents for a reading of 100 MA each.
- g. Put-S-2003 in NORMAL position and put drawer back in transmitter.

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SECTION I

H. OUTPUT METER ADJUSTMENT:

1. Place the SWR switch into the POWER position.
2. Adjust R-1257 Meter Balance which is located in the directional coupler in the PA compartment, until the KW/SWR meter reads ZERO. Lock in Place.

I. TRANSMITTER TUNING GENERAL:

1. Since this transmitter is a fully broadbanded device, the normal tuning devices found on the high frequency transmitters are no longer needed. The only controls that are needed are the Load Adjust Fine and Load Adjust Coarse which adjust the output impedance of the transmitter.
2. The IPA Driver is also fully broadbanded and since it is an Intermediate Amplifier there is no tuning, loading of matching of any sort needed.
3. The output of this transmitter is designed for 50 ohms. The Coarse adjust switch adjusts from 20 to 120 ohms. 20 ohms is 10 on the counter and 120 ohms is 60 in the counter. The Fin Adjust Switch adjusts from 50 to 43 ohms. 50 ohms being 20 on the counter and 43 ohms being 10 on the counter.
4. The majority of the test frequencies will be run at a Cours Adjust counter reading of 30 which is 50 ohms and a Fine Adjust counter reading of 20 which is 50 ohms. The higher frequenci s (400KC and up) may have to have different loading positions d pending upon how the impedance of the load varies.

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I. TRANSMITTER TUNING GENERAL CONT'D

5. Normally during test, the transmitter is tuned with a two tone audio signal connected to one of the two channel inputs. However, it may also be tuned with the carrier or a single audio tone.
6. Set the LFA output to minimum to prevent the IPA screen overload from tripping, and always ascertain that the drive is at minimum before applying high voltage to the transmitter.
7. The PA tubes must not be driven beyond 2.6 amperes total of plate current when attaining full output.
8. The total IPA plate current must not be driven beyond 300 ma. when attaining full output.
9. Turn transmitter ON with High Voltage OFF. Set LFA to minimum.

J. CARRIER TEST:

1. Connect a 50 ohm 5 KW unbalanced load to the output of the transmitter.
2. In the load, insert a 0-20 RF ampere meter in series with and between the input connector and the resistors.
3. Set Load Adj. Coarse for a reading of 30 on the counter and Load Adj. Fine for a reading of 20 on the counter.
4. Place SWR switch in the Power position.
5. Tune the exciter for an output frequency of 500 KC.
6. Turn the HV Breaker ON and increase the output of LFA until a reading of 10 amperes is achieved on the RF Ampere meter in the load.
7. Then adjust R1258 in the directional coupler until a reading of 5 KW is present on the KW/SWR meter. Lock in place. NOTE: The meter will read the power dissipated at the Load or antenna and not the power output of the transmitter. This is very important when looking into high VSWR Ratios.

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J. CARRIER TEST CONT'D

8. To see if the output has been matched efficiently into the load, vary the Load Adj. Coarse one position each way and monitor the amount of Plate and Screen Current drawn against Power Out in each position. Total Plate Current drawn with 5 KW AVG output should not exceed 2.6 amps. Screen Current should not exceed 50 MA. Set the the Load Adj. Fine and monitor the same conditions as befor . Adjust for maximum Power output with lease amount of Plate Current drawn.
9. Repeat the procedure in the previous part 8 for the rest of the frequencies indicated on the report sheet and record.

*K. DIRECTIONAL COUPLER CHECK:

1. Turn HV Breaker OFF.
2. In the output load insert a .01 4000V capacitor between the met r and resistors.
3. Tune the exciter to a frequency of 350 KCS.
4. Put SWR Switch in the POWER position, turn HV breaker ON and turn OVERLOAD adjustment fully clockwise.
5. Drive transmitter until an output of 1 KW is achieved in th KW/SWR meter.
6. Place SWR Switch in the CAL position and adjust CALIBRATE pot. until the meter reads CAL.
7. Place SWR Switch in the SWR position and the meter should read between 2.0 and 2.7.
8. Turn the OVERLOAD adjust counterclockwise until SWR ovid trips. Readjust OVERLOAD adjust fully clockwise and repeat procedure.
9. Reduce drive and change frequency to 225 KCS. Repeat entire procedure. SWR meter shouldread between 3.0 and 3.7.

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SECTION I

PART 1 REPORT SHEET

1. Mechanical Inspection _____
2. Short Circuit Checks _____
3. Cable Termination Checks _____
4. Fuse Checks _____
5. Blower Checks _____
6. Circuit Fusing Checks _____
7. Filament Primary Voltage set at _____ VAC
8. PA Bias A Voltage set at _____ VDC
9. PA Bias B Voltage set at _____ VDC
10. IPA Bias A Voltage set at _____ VDC
11. IPA Bias B Voltage set at _____ VDC
12. Overload Relays Checks _____
13. Tune-Operate Lights and Relay Checks _____
14. PA Screen Switch and Relay Checks _____
15. Time Delay Relay Operation Check _____
16. Alarm Operation Check _____
17. Protective Interlock System Check _____
18. High Voltage Circuits Checks
 - a. PA Plate Voltage, 1st Contactor Closed _____ KV
 - b. Time Interval between 1st Contactor and
Approximately 2nd Contactor Closing _____ Secs.
 - c. PA Plate Voltage, 2nd Contactor Closed _____ KV
 - d. PA Screen Voltage, Op rate _____ V; Tune _____ V.
 - e. IPA Screen Voltage, Operate _____ V; Tune _____ V.

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REPORT SHEET

19. IDLING PLATE CURRENT ADJUSTMENTS

- a. PA Idling Plate Current A Adjusted to _____ AMP.
- b. PA Idling Plate Current B Adjusted to _____ AMP.
- c. IPA Idling Plate Current 1 Adjusted to _____ MA
- d. IPA Idling Plate Current 2 Adjusted to _____ MA.

20. CHECK FOR PROTECTIVE DEVICES FOR REMOVAL H.V.

- a. PA Plate Overload _____
- b. PA Screen Overload _____
- c. Zener Diode Protect Relay _____
- d. IPA Plate Overload _____
- e. IPA Screen Overload _____
- f. PA Bias relay _____
- g. SWR Overload _____

21. OVERLOAD ADJUSTMENTS

- a. PA Plate Overload set to trip at _____ AMP.
- b. PA Screen Overload set to trip at _____ MA.
- c. IPA Plate Overload set to trip at _____ MA.
- d. IPA Screen Overload set to trip. _____

22. OUTPUT METER ADJUSTMENT

23. CARRIER TEST

<u>FREQUENCY</u>	<u>OUTPUT</u>
5 KC	_____ KW
100 KC	_____ KW
250 KC	_____ KW
500 KC	_____ KW
540 KC	_____ KW

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REPORT SHEET

- 24. DIRECTIONAL COUPLER CHECK
 - a. SWR on 2 to 1 trips out _____
 - b. SWR on 3 to 1 trips out _____
- 25. Unbalanced tuning Complete and Distortion Check _____
- 26. ALDC Circuit test made on _____ KC _____
- 27. APP-15 Channel 2 Audio Input _____
- 28. KMCU Operation
 - Keying _____
 - Status Lights _____

Tested By _____ Mfg. No. _____

Approved by _____ Data _____

Remarks _____

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TITLE: GPT-10KLF SECTION II

REPLACEMENT OF TIS (TONE INTELLIGENCE SYSTEM) WITH KMCU (KEYER MONITOR CONTROL UNIT).

Principle of Operation for Transmitter

Other than outlined in Section II of S-1084 the keyer section of the KMCU controls the Tune-Oper relay by reducing the plate current to zero in a standby condition. (No external keying and test key in neutral position.)

The monitor section provides for observation of the transmitter operation by lighting various lamps connected as outlined in Section II of S-1084.

For operation of the Lamps the KMCU accepts three indications of Transmitter operation.

1. Plate Voltage indication
2. Radio frequency output indication
3. Keying input indication

Indicator Functions

1. Amber Light-Ready
Indication that Plate Voltage is applied to transmitter and transmitter is awaiting keying information.
2. Red Light - Failure
Indication that there is a failure of a voltage to the unit.
3. Green Light - On Air

Indication that there is keying present and that all proper voltages are present.

Procedure

The procedure for Section I of S-1085 can be utilized in its entirety, bearing in mind the KMCU Test Key must be energized

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GPT-10KLF SECTION II

or keying information must be supplied to key line.

1. Check for proper operation of Indicator Lamps.
2. Check for proper keying of R.F. output.
3. Record all checks on Test Data Sheet.

