DATE 2/19/65	TMC SPECIFICATION NO. S-907	B
SHEET 1 OF 9		
COMPILED REM / CHECKED L.E.L.	TITLE: SYSTEM TEST PROCEDURE FOR MCTR-350	
APPROVED RDL		

INTRODUCTION:

The MCTR-350 is a 350 Watt PEP transmitter and receiver configuration giving the customer provisions for monitoring 1 through 8 fixed tuned frequencies by means of Push button channel selectors located on the TPC-11 telephone control unit. The unit is basically designed to be SSB voice, simplex operated. The Vox control system is not employed with this configuration. The TPC-11 has in addition to the 8 channel selector buttons. "Xmitter ON, "Xmitter Standby", USB/LSB Selectors a 4 ohm loud speaker with associated volume control. The handset contains the carbon mike and the telphone receiver which when the handset is removed from its cradle the speaker is cut out and the audio is heard in the telephone receiver of the handset. The receiver has individual control of line and monitor audio outputs as well as squelch features.

The MCTR-350 consists of the following units:

RAK-106 (Rack)

TPC-11 Telephone Control Unit.

ATS-50-2 Antenna Tuning System.

PAL-350A Power Amplifier

SME-1 Exciter Unit (SSB)

SMRA-1 Receiver Unit (SSB)

LSP-6X Loud speaker panel with additional power supply. Power supply furnishes Power to Leadex drive motor on SMRA-1 and indicator lights on the TPC-11. Right hand speaker is a spare and may be used for an additional receive circuit if desired.

ECPA-1 Intercable connect drawer and control lines. Transmitter, tune, remote switch, and SPEAKER REMOTE LOCAL switch.

PSP-350 Power Supply for PAL-350A.

RL-139 Antenna changeover relay.

TEST EQUIPMENT REQUIRED:

RF sig gen Model 82 or equivalent.

PTE-3 TMC Analyzer.

NOTE: Indicate completion and acceptance of portion(s) of this test preceeded by (*) by recording required observed value or by check (✓) mark as required on attached test Data Sheets.

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4 Ohm Resistor, Carbon composition 1 watt.

Dummy Load - 50 ohms (Bird Termaline 500 Watts)

Dummy Load - 50 ohms 1 Watt carbon composition with BNC connector

H.P. 410 or equivalent.

Ballantine AC. Voltmeter

Associated cables as necessary.

CAUTION: The exciter and receiver portions of this equipment are solid stated devices. Any indiscriminate resistance measurements may harm these units. Where further tests are required refer to individual test procedures for SME-1 and SMR-1.

PRELIMINARY:

A. Inspect unit for mechanical defects, proper sliding of units on tracks etc.

B. Inspect for electrical wiring defects loose connections etc.

C. Plug AC Power cord into 115 V AC Outlet.

D. Connect dummy load to antenna coax connector relay RL-139, and connect H.P. 410 across load.

E. Plug connector of TPC-11 control unit to appropriate connector, located bottom rear of MCTR-350.

F. Connect output of TTG Generator to terminals 1 and 3 of E-1501 terminal strip of SME 1 exciter. Connect shield to terminal 2.

PROCEDURE:

It is understood that the SME-1 and SMRA-1 portions of this configuration have been previously tested with test papers supplied.

1. OPERATIONAL CHECK:

a. Turn on "MAIN LINE SWITCH" of PSP-350. PAL-350 Air Blower should be audible. Green light on PSP-350 should light.

b. Place "XMITTER PLATES" Switch to "ON" Position. After

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approximately 1 minute, the "Overload Breaker indicator light" should come on.

c. Place "XMITTER PLATES" switch to "STANDBY REMOTE" position.

d. Place H.V. line breaker switch ON.

e. Push "Xmitter ON" Button of TPC-11. H.V. should come on. Red H.V. indicator light should light.

f. Push "XMITTER STANDBY" Button of TPC-11 High Voltage, should go OFF. Red indicator light should go out.

g. Place H.V. LINE BREAKER SWITCH OFF. Yellow indicator light should come on, with TPC-11 "XMITTER ON" switch on.

h. Turn on Power switch of SME-1 (exciter) and SMRA-1 (receiver) Associated Indicator lights should light.

i. Turn ON Switch on Front Panel of LSP6X (Speaker Panel). "XMITTER STANDBY" red indicator on TPC-11 should light.

NOTE: This switch furnishes AC power to a power supply on back of LSP6X which supplies voltages to the lights on the TPC-11 and to the LEDEX motors of the SMRA-1 .

j. Depress Channel Selector switches 1 through 8 on the TPC-11 firmly, one at a time, noting that channel indicator lights light and that channel selector indicator on front of SMRA-1 indicates the same number as the selected channel shows on the TPC-11.

*2. INTERLOCK CHECK

a. With xmitter "H.V. LINE SWITCH" OFF (Yellow Light Indicating) and "XMITTER ON" switch of TPC-11 depressed remove and replace one at a time the top and bottom covers of the PAL-350 amplifier. Each time a cover is removed the "H.V. OVERLOAD BREAKER" indicator light should go out.

b. Repeat this same procedure with PSP-350 top cover noting that yellow indicator light goes out.

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3. TRANSMITTER TUNING AND LOADING PROCEDURE:

a. Making certain the XMITTER TUNE/OPERATE switch is in REMOTE position and handset is not keyed, select desired frequency on exciter by turning selector switch to appropriate channel.

b. Place driver tuning bandswitch of PAL-350 to appropriate band position.

c. Turn P.A. BANDSWITCH to corresponding band.

d. Place multimeter switch to DR position 0-50V.

e. Place mode selector on exciter to "AME" Position. This re-inserts carrier for tuning.

f. Place TUNE-REMOTE switch on ECPA-1 drawer to TUNE position. Increase RF gain control until meter in RF Position on SME shows an indication.

g. Transmitter plates switch on.

h. Tune "DRIVER TUNING" for maximum indication on multimeter.

i. Reduce drive to PA with RF control on SME-1 so as not to overdrive while tuning.

j. Place HV switch "ON". "TRANSMITTER PLATES" switch "ON".

k. Increase exciter RF drive enough to dip plate current of PAL-350.

l. Alternately increase drive, load with loading control and dip plate current with PA tuning until required output is reached as indicated on VSWR Output meter.

REQUIREMENT: 175 Watts or 93 Volts across 50 ohms.

m. Turn exciter RF drive control CCW minimum.

n. Turn off high voltage switch. Place "TUNE-REMOTE" switch to REMOTE (ECPA-1)

*4 DISTORTION TEST:

a. Turn on TTG adjusted for two tones, connect Ballantine to terminals 1 & 3 of E1501 and adjust TTG output for 77.5MV. Remove Ballantine. Connect shield to terminal 2.

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b. Adjust AF gain on SME-1 for -12db as read on front panel meter, with meter switch in AF position.

c. Anti-VOX, VOX gain to Min ccw.

d. Mode selector switch in SSB.

e. Sideband Selector Switch in USB.

f. VOX, PTT Switch in PTT. position.

g. TUNE-REMOTE Switch to Tune.

h. AF-RF Meter Switch to RF Position.

i. Turn on HV Switch on PSP-350.

j. Adjust RF gain control to give full PEP output, as indicated on output meter.

Requirement: 175 Watts or 93 volts across 50 ohms.

k. With PTE-3 appropriately adjusted to monitor transmitted frequency measure distortion.

Requirement: 35 db down from either tone of a standard two tone test.

l. Place sideband selector switch on SME-1 to LSB. Distortion products should be the same as in USB. Return Sideband Selector Switch to USB/Remote and depress LSB Button on TPC-11. Sideband should shift.

NOTE: Make certain that REMOTE USB/LSB switch on the SMRA-1 is in the REMOTE USB position after TPC-11 test.

m. Place "TRANSMITTER PLATES" switch in "STANDBY REMOTE" position and depress handset button on TPC-11.

n. Holding handset button closed, depress LSB button on TPC-11 and see if PTE-3 indicates sidebands have shifted.

o. Turn OFF HV breaker, "TUNE REMOTE" Switch to remote position. Repeat paragraphs 3 and 4 for all 8 channels, making certain to have exciter in an unkeyed position while selecting channels (i.e.) Place RF drive control to minimum and "TUNE-REMOTE" switch in REMOTE position.

*p. Upon completion of step (m) set up transmitter and check out ATS system.

q. This completes transmitter section checkout. Remove all test equipment and set up for receiver section checkout.

5. OPERATIONAL RECEIVER CHECKOUT:

a. Disconnect coax lead from SMRA-1 J-1502 and connect test set up as shown in Figure 1.

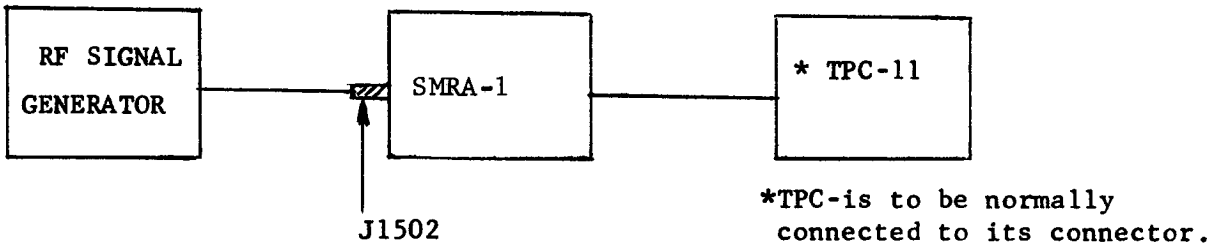

FIGURE 1.

b. Set up SMRA-1 and Signal Generator on channel frequency to be checked.

c. Adjust signal generator for 100 Micro Volts modulated at 1000 output.

* d. Set volume controls maximum clockwise on SMRA-1 and TPC-11.

e. Set simplex-duplex switch to simplex.

f. Place sideband selector switch to USB/REMOTE position. "REMOTE/LOCAL SPEAKERS" switch to remote.

NOTE: At this point make certain that "USB/Remote" Switches on both the SMRA-1 and the SME-1 are in the USB position.

g. Place squelch control maximum clockwise.

h. Modulated tone should be audible in speaker of TPC-11.

i. Adjust audio output for listening comfort.

* j. Place sideband switch on TPC-11 in LSB position.

k. Tone should still be audible with slight re-adjustment of signal generator, indicating sidebands have shifted.

l. Turn off signal generator.

m. Tone should disappear and "Receiver noise" should be heard.

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*n. Turn "SQUELCH" CCW until "Receiver Noise" is no longer audible.

o. Turn ON Signal generator set for 100MV modulated.

p. Tone should once more be audible.

* q. Vary clarifier on SMRA-1 and note variation in tone.

r. Reset SQUELCH control fully clockwise. This completes operational check.

6. SENSITIVITY CHECK Disconnect TPC-11 from its connector and turn off LSP-6X switch. Set up in accordance with Figure 2.

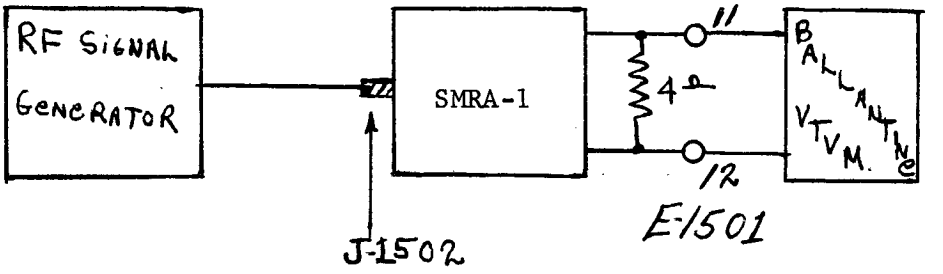

FIGURE 2.

a. With SMRA-1 set up as in steps (a through h) of operational check adjust signal generator for an output of 100 Microvolts at the desired frequency.

b. With "REMOTE/LOCAL SPEAKER" switch in "LOCAL", tune signal generator until a beat is heard on speaker. Reduce signal generator output until beat note just exceeds noise.

NOTE: Some Retuning of signal generator may be required as output is reduced.

c. REMOTE/LOCAL SPEAKER switch to "REMOTE", readjust volume control to obtain reading on Ballantine VTVM.

d. Adjust signal generator output for 1 microvolt.

e. Set Ballantine to the 1 volt full scale position and adjust volume control for a reading of .78V. This is the signal + noise level, read in db.

f. Remove signal generator from antenna jack J1502 and connect 50Ω dummy load.

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g. Read output now indicated on Ballantine using signal + noise level as db reference. This reading is noise level in db.

* Ratio should not be less than 20 db.

$$\frac{\text{Signal + Noise}}{\text{Noise}} \quad \text{Ratio}$$

Requirement: Above ratio shall not exceed 20 db.

h. Repeat above procedure for all channels. Select channels manually turning clockwise.

i. Make all entries on Test Data Sheet. Secure all equipment. This completes MCTR-350 checkout.

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DATE 2/19/65 SHEET 9 OF 9	TMC SPECIFICATION NO. S-907	B
COMPILED / CHECKED	TITLE: SYSTEM TEST PROCEDURE FOR MCTR-350	
APPROVED	MCTR-350 TEST DATA SHEET	

	TRANSMITTER:						RECEIVER:
CHAN.	FREQ.	3.1. FWD. PWR.	REFL. PWR	VOLTAGE AT 50Ω LOAD	4 DISTORTION USB	4 DISTORTION LSB	SIGNAL + NOISE / NOISE RATIO
1							
2							
3							
4							
5							
6							
7							
8							

TRANSMITTER:

1. OPERATIONAL CHECK: (a through i) _____( )
2. INTERLOCK CHECK: _____( )

4 (n) ATS SYSTEM _____( )

RECEIVER:

(5d) VOLUME CONTROLS _____( )

(5o) SQUELCH _____( )

(5r) CLARIFIER _____( )

(5k) USB/LSB _____( )

MFG. NO. _____ SERIAL NO. _____ DATE _____

TESTED BY _____ APPROVED BY _____

REMARKS:

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REVISION SHEET

THE TECHNICAL MATERIEL CORP.
MAMARONECK NEW YORK

S-907 B
LIST NO.

DATE	REV.	SHEET	EMN #	DESCRIPTION	APP.
2/24/65		1 of 9		O=ORIGINAL RELEASE FOR PRODUCTION.	
3/18/65	A	2-9	13743	Revised shts.2-9 per EMN	K
10/24/66	B	----	17111	Sheets 1,2,3,5,6 and 7, revised per EMN	ac