

DATE 4-2-59
SH. 1 OF 4
COMPILED BY
RWB

TMC SPECIFICATION NO. S 419

TITLE: PRODUCTION TESTING OF TMC MODEL TTG

JOB

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1. INTRODUCTION:

A. The TTG is a Tone Generator designed to generate Audio and R.F. signals.

For test purposes, it may be divided into 2 sections:

1. The Audio Oscillator and Amplifier Section

2. The R.F. Oscillator and Amplifier Section

B. The Audio Oscillator and Amplifier Section:

This section generates two audio tones at approximately 935 and 2805 cps. These tones may be used separately or together as the operator desires. Switching the tones OFF or ON is accomplished by removing or applying plate voltage to the amplifier stages following the oscillators. The oscillators are of the Wein Bridge type and the frequency of the oscillation are determined by frequency determining networks which are an integral part of the oscillator circuit. The output of each tone amplifier is coupled to a filter whose bandpass frequency is 935 cps for tone #1 and 2805 cps for tone #2. These filters insure a relatively distortion free audio tone. The overall output, after the tones are combined (if a two tone test signal is used,) is controlled by a 600 Ω "T" pad. The output impedance will be 600 Ω at all times.

C. The R.F. Oscillator and Amplifier Section:

This section generates two R.F. tones at 1.999 kcs and 2.001 kcs. These two tones may also be used independently or together as in the audio section. The switching is accomplished in the same manner. The oscillator is a Modified Pierce type. The output amplitude of these oscillators is adjusted by variable coupling capacitor between the oscillator and amplifier of each stage. The level is set so that both outputs are equal in amplitude after the plate of each amplifier

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is tuned to resonance. This tuning is done by L-502 for tone #1, and L-503 for tone #2. After alignment, the level controls should not be touched again as the output of these oscillators are required to have a fixed output amplitude.

2. TEST INSTRUCTIONS:

- A. Proceed as outlined in Test Sequence and Procedure below.
- B. Fill in blanks on report sheet, rejecting those units that do not meet the specifications.

3. TEST SEQUENCE AND PROCEDURE:

PART 1 MECHANICAL INSPECTION:

- A. Inspect the unit for obvious mechanical imperfections.
- B. Inspect the unit for obvious electrical errors.
- C. Carefully inspect the unit for loose screws at critical points. Most carefully inspect for loose screws on grounding points such as tube socket nut straps and ground lugs.

PART 2 PRELIMINARY TEST AND AUDIO SECTION TEST:

- A. Connect unit to power line and energize the set.
- B. Observe: All filaments and pilot lamp illuminated.
- C. Measure B+ at pin 6 of V500 and V501. Voltage must fall between 1150 V and 175 V.
- D. Observe whether B+ drops out at terminal 2 of T504 when "Audio Tone Selector" switch (S502) is in the "Tone 1" position.
- E. Observe whether B+ drops out at terminal 2 of T503 when S502 is in the "Tone 2" position.
- F. With S502 in "Two Tone" position B+ should be present at Terminal 2 of both T503 and T504.

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- G. With S502 in "OFF" position no B+ should appear at either T503 or T504.
- H. With S502 in "Tone 1" position measure B+ at top end of R527. Reading should be 160 VDC. Check top end of R528. No B+ should be present. Change S502 to "Tone 2" position and measure B+ at top end of R528. Reading should be 160 VDC. Check top end of R527. No B+ should be present.
- J. Connect AC VTVM and Panoramic Sonic Analyzer (IP-1a) to output terminal strip, E500; set R524 and R518 to maximum, S502 to "Tone 1" position and adjust degeneration control, (R501) until an indication is observed on VTVM. NOTE: It may be necessary to try several BI-102-3's before oscillator will perform properly.
- Adjust control on NF-104-935 (Z500) for peak indication on VTVM. Observe Analyzer and adjust R501 for minimum second harmonic distortion without affecting oscillator "starting". This distortion, as viewed on analyzer, should be at least -55 db down. Recheck Z500 for peak on VTVM. Adjust Tone 1 level control (R-518) for 1.0 VAC on VTVM. Tighten lock on R501 and R518.
- K. With Analyzer and VTVM still connected to E500, set R519 to maximum, S502 to "Tone 2" and adjust degeneration control (R513) until an indication is observed on VTVM. Adjust control on NF-104-2805 (Z501) for peak indication on VTVM. Observe analyzer and adjust R513 for minimum second harmonic distortion without affecting oscillator "starting". The note in step "J" applies to this step also. The distortion should be at least -60 db down. Recheck Z501 for peak on VTVM. Adjust Tone 2 level control (R519) for 1.0 VAC on VTVM. Tighten lock on R513 and R519.

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L. Set S502 on "Two Tone" position and recheck distortion on analyzer.

PART 3 R.F. OSCILLATOR AND AMPLIFIER SECTION TEST:

- A. Connect R.F. VTVM to the R.F. Output jack (J501). Set "RF Tone Selector" switch (S501) to "Tone 1" position and measure B+ voltage on Pin 1 of V504. Voltage should be 160 VDC. Check pin 1 of V505. No voltage should be present. Set C520 to maximum and tune L502 for maximum reading on RF VTVM. Tighten lock nut on L502 slug. Set C520 for 1.5 VRF output.
- B. Set S501 to "Tone 2" position and measure B+ voltage on pin 1 of V505. Voltage should be 160 VDC. Check pin 1 of V504. No voltage should be present. Set C521 to maximum and tune L503 for maximum reading on RF VTVM. Tighten lock nut on L503 slug. Set C521 for 1.5 VRF output. Connect analyzer, with mixer, to R.F. output jack and examine tones. Distortion products should be at least 60 db below tone.