

# TUNE-UP PROCEDURE

General Microwave Services, Inc.  
ST-10000 Series Transmitter

The following procedure should be followed by personnel familiar with proper test equipment operating practices and procedures only. Review all test procedures before beginning.

CAUTION: Do not operate ST-10000 in high power mode without suitable heatsink!

## ***EQUIPMENT REQUIRED***

- Spectrum Analyzer suitable for measurement over the operating frequency range of the ST-10000 transmitter under test.
- Oscilloscope.
- Signal generator with better than 1% THD.
- Audio signal generator with better than 0.01% THD.
- DC power supply capable of +12 V at 2.0 A.
- Microwave directional coupler.
- 50  $\Omega$  RF termination.
- Audio distortion analyzer.
- Test receiver.
- Suitable interconnect cables.

## **PROCEDURE**

1. Connect the ST-10000 RF output connector to a microwave directional coupler and  $50 \Omega$  RF termination.
2. Connect the sample output of the directional coupler to the input of an RF spectrum analyzer.
3. Apply  $+12$  VDC  $\pm 2$ V to power connector J2.
4. Observe the RF carrier generated by the ST-10000 on the spectrum analyzer to verify the proper frequency of operation.
5. To enter modulation sensitivity adjust mode hold down all four front panel push-buttons and apply DC power.
6. Use the CRTL key to scroll through the setup menu to the appropriate parameter to be adjusted.
7. Apply a precise 761 kHz signal at 162 mV RMS (terminated into  $75 \Omega$ ) to the video input connector J1.
8. Observe the RF carrier on the spectrum analyzer and adjust the modulation by operating the UP or DOWN ARROW push-buttons on the front panel as required for the first carrier null. Press ENTER to save the setting. Repeat the process for each RF channel.
9. Remove the test signal from J1.
10. Scroll through the setup menu to the appropriate audio setup menu.
11. Apply a 400 Hz signal at -50 dBm to J2 Audio 1 subcarrier input to adjust microphone level.
12. Observe the RF subcarrier on the spectrum analyzer and adjust the modulation by operating the UP or DOWN ARROW push-buttons on the front panel as required to achieve 100% deviation. Press ENTER to save the setting. Repeat the process for Audio 2 subcarrier 2.
13. Apply a 400 Hz signal at 0 dBm to J2 Audio 1 subcarrier input to adjust line level.

14. Observe the RF subcarrier on the spectrum analyzer and adjust the modulation by operating the UP or DOWN ARROW push-buttons on the front panel as required to achieve 100% deviation. Press ENTER to save the setting. Repeat the process for Audio 2 subcarrier 2.
15. Use a suitable test receiver tuned to the appropriate subcarrier frequency and verify distortion at  $\leq 1.0\%$  for each audio channel and input level.
16. Set audio oscillator frequency to 1 kHz. Obtain reference level on audio voltmeter.
17. Sweep the audio oscillator between 10 Hz - 15 kHz. Response should be within  $\pm 1.5$  dB from 1 kHz reference. Repeat process for each audio channel and input level.
18. Remove audio test signal.
19. Observe audio subcarrier injection level on spectrum analyzer. Injection should be between -24 to -32 dBc. (Injection level varies with subcarrier frequency.)
15. Replace any chassis covers removed during the procedure and verify all hardware is tight.

## OPERATING INSTRUCTIONS

### ST-10000 SERIES MICROWAVE TRANSMITTER

Operation of the ST-10000 Series microwave transmitter is simple and straightforward. Since the ST-10000 emits radio frequency energy, care should be taken to avoid excessive human exposure to the signal radiated from the antenna attached to the transmitter output.

All connectors and controls necessary for proper operation of the ST-10000 are accessible to the operator on the outside of the housing. No user controls are located inside the chassis. The ST-10000 should be returned to the factory if service becomes necessary.

Before operating the transmitter, insure that the intended channel of operation is clear of other signals. Improper operation of the ST-10000 transmitter could result in interference to other stations operating on the same or adjacent frequency.

**Before operating the ST-10000 transmitter,  
affix the baseplate to a suitable heatsink.**