

T.O. 33K3-4-2362-1

TECHNICAL MANUAL
CALIBRATION PROCEDURE
FOR
COMMUNICATIONS SERVICE MONITOR
FM/AM 1000 A

(IFR INC)



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COMMUNICATIONS SERVICE MONITOR**FM/AM 1000 A****(IFR INC)****1 CALIBRATION DESCRIPTION:***Table 1.*

Test Instrument (TI) Characteristics	Performance Specifications	Test Method
Signal Generator Frequency (Master Oscillator)	Range: 10 MHz Accuracy: ± 1 Hz or less	Verified with Electronic Connector
Output Level Calibration	Range: -47.0 dBm Accuracy: ± 2.5 dBm	Verified on Vector Voltmeter
RF Power Meter	Range: 0 to 10, 0 to 100 W at 150 MHz Accuracy: $\pm 10\%$	Verify RF Source with Standard Wattmeter and compare TI Meter

2 EQUIPMENT REQUIREMENTS:

Noun	Minimum Use Specifications	Calibration Equipment	Sub- Item
2.1 ELECTRONIC COUNTER	Range: 10 Hz to 900 MHz Accuracy: 5×10^{-10} /day at 10 MHz	Hewlett-Packard 5345A with 10590A adapter and 52 57A Transfer Oscillator	
2.2 RF POWER SOURCE	Range: 0 to 50 Watts at 150 MHz Accuracy: N/A	Microdot 406A	
2.3 POWER METER	Range: 5 and 50 Watts at 150 MHz Accuracy: $\pm 5\%$	Bird Model 43	as available
2.4 50 OHM LOAD	Range: DC to 900 MHz Accuracy: $\pm 3\%$	As available from stock	

3 PRELIMINARY OPERATIONS:

3.1 Review and become familiar with entire procedure before beginning calibration process.

WARNING

Unless otherwise designated, and prior to beginning the Calibration Process, ensure that all test equipment voltage and/or current outputs are set to zero (0) or turned off, where applicable. Ensure that all equipment switches are set to the proper position before making connections or applying power.

3.2 Mechanically zero TI Panel Meters.

3.3 Connect the TI and all calibration equipment to the appropriate power source. Set all POWER switches to ON all allow the proper warm-up time before beginning the calibration process.

4 CALIBRATION PROCESS:

NOTE

Unless otherwise specified, verify the results of each test and take corrective action whenever the test requirement is not met, before proceeding.

4.1 SIGNAL GENERATOR FREQUENCY CALIBRATION:

4.1.1 On TI set AUTO/OFF/ZERO BAT switch to AUTO, RCVD/GEN switch to RCVR and AM/FM switch to AM.

4.1.2 Connect TI 10 MHz REF OUT connector to Electronic Counter CH.A Input. Set Electronic Counter controls for a frequency measurement and adjust controls as required for stable indication.

4.1.3 Adjust TI 10 MHz-CAL (screwdriver pot) on Front Panel until Electronic Counter indicates 10,000,000 \pm 1 Hz or less. Disconnect TI from Electronic Counter.

4.2 FREQUENCY ERROR METER SELF CHECK:

4.2.1 On TI set AM/FM switch to FM, RCVR WIDE/MID/NARROW switch to NARROW and FREQUENCY MHz to 000 000 0. Set ANAL DISPR control fully CCW (OFF) if applicable.

4.2.2 Set TI Oscilloscope VERT SENS kHz switch 15 VAR to CAL), AC/OFF/DC switch to DC. Set SWEEP controls as required to center scope trace.

4.2.3 Set TI FREQ ERROR RNG switch to 15 kHz and zero FREQUENCY ERROR Meter.

NOTE

Zero the FREQUENCY ERROR Meter using the ZERO-RCVR control on TI front panel. FREQUENCY ERROR Meter Zeroing should be done in GEN function on 1.5 kHz range of Meter.

4.2.4 Set TI FREQUENCY MHz to 000 010 0. Verify TI FREQUENCY ERROR Meter indicates a negative 9 to 11 kHz.

4.2.5 Verify the TI Oscilloscope indicates a negative 9.5 to 10.5 kHz.

4.2.6 Using the methods of steps 4.2.1 thru 4.2.5 and changing the TI controls, as applicable, check the 5 kHz (6 kHz oscilloscope) and 1.5 kHz ranges on FREQUENCY ERROR Meter and Oscilloscope.

4.3 DEVIATION METER SELF CHECK:

4.3.1 Set TI RCVR/GEN switch to RCVR, FREQUENCY MHz to 000 000 0 and DEV/PWR switch to 2 kHz. Set INT MOD to OFF.

4.3.2 The TI DEVIATION Meter must indicate zero ± 100 Hz.

4.3.3 On TI set RCVR/GEN switch to GEN, RCVR WIDE/MID/NARROW switch to MID (center position).

4.3.4 The TI DEVIATION Meter must indicate zero ± 50 Hz.

4.3.5 On TI set DEV/PWR switch to 20 kHz and MODULATION FREQ Hz switches for 1000 Hz. Adjust INT MOD level control for a TI Oscilloscope indication of + and - 10 kHz.

4.3.6 The TI DEVIATION Meter must indicate between 9,300 and 10,700 Hz.

4.3.7 Reduce TI INT MOD level control for a TI Oscilloscope indication of + and - 5 kHz. Set DEV/PWR switch to 6 kHz. The TI DEVIATION Meter must indicate 4,650 to 5,350 Hz.

4.3.8 Reduce TI INT MOD level control for a TI Oscilloscope indication of + and - 2 kHz. The TI DEVIATION Meter must indicate 1.8 to 2.2 kHz.

4.4 OUTPUT LEVEL SELF CHECK CALIBRATION:

4.4.1 On TI set INT MOD to OFF. Set OUTPUT ATTENUATOR for 10 μ volts (-87 dBm). Set H1 LVL/UVX100/NORM switch to UVX100 (+40 dB) position.

4.4.2 On TI set FREQUENCY MHz to 157 000 0. Connect TI TRANS-RCVR connector to the Vector Voltmeter INPUT thru a 50 ohm load.

4.4.3 The Vector Voltmeter must read 44.5 to 49.5 to 49.5 dBm.

4.4.4 Disconnect Vector Voltmeter and 50 ohm load from TI.

4.5 RF POWER METER CALIBRATION:

4.5.1 On TI set DEV/PWR switch to X1 Watts.

4.5.2 Set RF Power Source for a minimum Output at 150 MHz. Connect the RF Power Source Output through the ThruLine Wattmeter to the TI TRANS/RCVR connector.

4.5.3 Set RF Power Source Output for a 5 Watt indication on the ThruLine Wattmeter. Verify TI Wattmeter indication is 4.5 to 5.5 Watts.

4.5.4 On TI set DEV/PWR switch to X10 Watts.

CAUTION

Do not apply the power of step 4.5.5 for more than 20 seconds to prevent damage to TI.

4.5.5 Set RF Power Source Output for a 50 Watt indication on the ThruLine Wattmeter. Verify TI Wattmeter indication is 45 to 55 Watts.

4.5.6 Set RF Power Source Output to minimum and disconnect Wattmeter and Power Source from TI.

CALIBRATION PERFORMANCE TABLE

Not Required