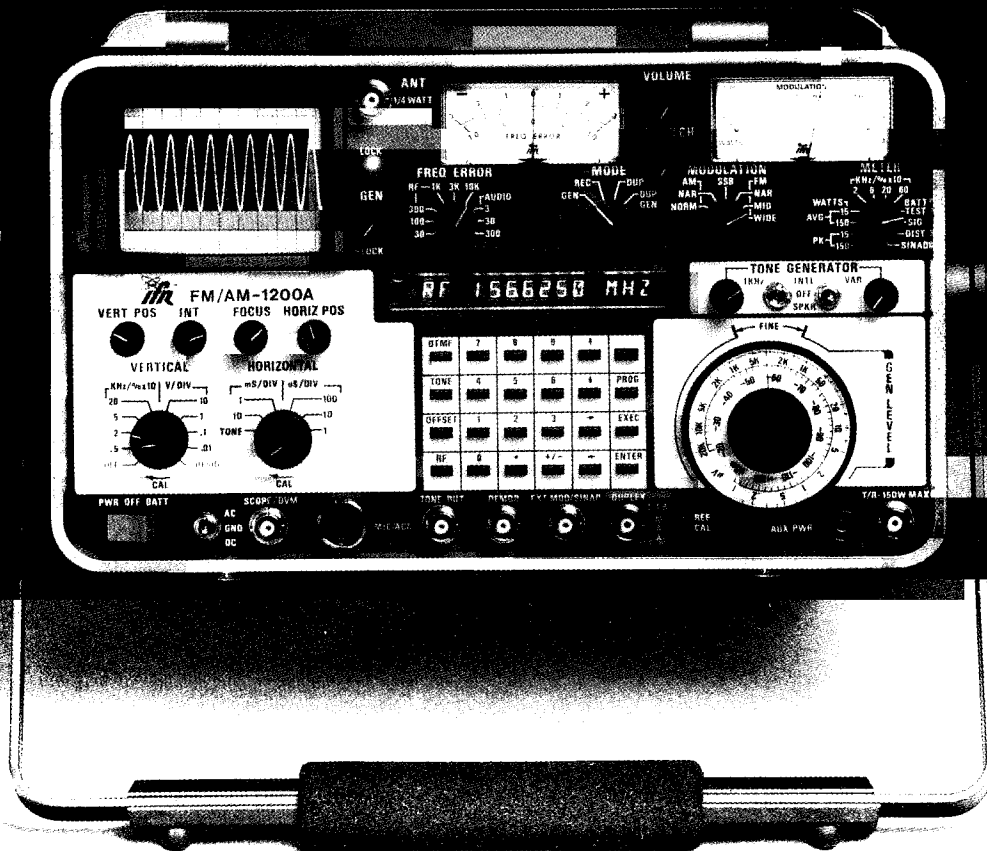


# The FM/AM-1200A



## Displays

The FM/AM-1200A incorporates a combination of analog meters and a digital vacuum fluorescent display (VFD) to present UUT and instrument operating parameters. The use of both types of displays makes it convenient to operate the instrument in all types of lighting conditions.

## Signal Generator

The FM/AM-1200A signal generator is capable of generating modulated or unmodulated signals within a range of 250 kHz to 999.9999 MHz at an output level that is adjustable from -127 to -20 dBm. The generator may be AM or FM modulated by internal modulation sources or by an external source applied through a front panel connector. The internal modulation sources include a 1 kHz fixed audio source and a variable frequency function generator. Additional signaling sources include: 2-tone, 5/6-tone, DCS, IMTS and pulsed audio.

## Receiver

The FM/AM-1200A receiver is a sensitive 2  $\mu$ V triple conversion receiver capable of monitoring AM, FM and SSB carriers within a range of 100 kHz to 999.9999 MHz. Signals may be received "off-the-air" using an external antenna or by direct connection to the T/R port. Measurement resources available in the receiver include: RF frequency error, RF power, audio frequency error, modulation and oscilloscope.

## Duplex Generator

In duplex mode, the FM/AM-1200A has the capability of generating and receiving simultaneously with a frequency offset from 0 to  $\pm 49.99$  MHz in 10 kHz steps. The instrument can be operated in any of three duplex modes:

- Duplex testing using separate transmit/receive lines.
- Duplex testing using one common transmit/receive line.
- "Off-the-air" duplex testing.

## Oscilloscope

The FM/AM-1200A includes a 1 MHz oscilloscope capable of monitoring the instantaneous modulation characteristics of AM or FM modulated carriers. A residual mode allows the user to display the residual distortion or noise of the UUT, as received at the SINAD input port.

## Standard Features Include:

- FM signal generator
- AM signal generator
- Duplex generator
- 2  $\mu$ V receiver for AM, FM and SSB
- RF frequency error meter with 1 Hz resolution
- Audio frequency error meter with 0.1 Hz resolution

- Deviation/modulation meter
- RF power meter
- Relative signal strength meter
- SINAD/distortion meter
- 1 kHz audio generator
- Audio function generator
- DCS encode/decode
- IMTS
- 10 PS and 20 PS pulsed audio
- 1 MHz oscilloscope
- RS-232 interface
- Internal battery for portable operation
- $\pm 0.2$  PPM TCXO

## Options

- $\pm 0.05$  PPM OCXO Time Base
- 30 dB Generate Amplifier
- Microphone
- Telescoping Antenna
- Soft Padded Carrying Case
- European Signaling
- IEEE 488 (in lieu of RS-232)
- DVM + DTMF Decode

# FM/AM - 1200A

## specifications

### RF SIGNAL GENERATOR

<b>Frequency Range:</b>	250 kHz to 999.9999 MHz
<b>Resolution:</b>	100 Hz
<b>Accuracy:</b>	Same as Master Oscillator
<b>Output (T/R) Range:</b>	-127 to -20 dBm
<b>Resolution:</b>	10 dB steps with 11 dB vernier
<b>Accuracy:</b>	±2.5 dB
<b>Spectral Purity Harmonics:</b>	≤ -30 dBc
<b>Nonharmonics:</b>	≤ -55 dBc
<b>Residual FM:</b>	<100 Hz (rms, 0.3 to 3 kHz BW)
<b>Input Protection:</b>	150 W

### DUPLEX GENERATOR

<b>Frequency Range:</b>	0 to ±49.99 MHz from receive frequency
<b>Resolution:</b>	10 kHz
<b>Accuracy:</b>	See Master Oscillator
<b>Output Level Duplex:</b>	-60 dBm
<b>T/R:</b>	-80 dBm
<b>Input Protection:</b>	0.25 W

### MODULATION

<b>Frequency Modulation Range:</b>	0 to 50 kHz (1 kHz tone)
<b>Rate:</b>	10 Hz to 30 kHz (Internal) 2 Hz to 30 kHz (External)
<b>Accuracy:</b>	±5% of reading, ±3% of full scale (1 kHz tone)
<b>Distortion:</b>	<1% (to 20 kHz deviation)
<b>EXT MOD sensitivity:</b>	0.1 Vrms/kHz (-0% +30%)
<b>Amplitude Modulation Range:</b>	0 to 90%
<b>Rate:</b>	10 Hz to 10 kHz (30% maximum modulation above 5 kHz)
<b>Accuracy:</b>	±5% of reading, ±3% of full scale (1 kHz tone)
<b>Distortion:</b>	<10% (to 60% modulation)
<b>EXT MOD sensitivity:</b>	0.01 Vrms/% (-0% to +30%)

### AUDIO GENERATORS

<b>Generator #1 Frequency Range:</b>	1 kHz
<b>Accuracy:</b>	Same as Master Oscillator
<b>Output Range:</b>	0 to 2.5 V (rms, into 150Ω)
<b>Distortion:</b>	<0.5%
<b>Waveshape:</b>	Sine
<b>Audio Generator #2 Frequency Range:</b>	10 Hz to 30 kHz
<b>Resolution:</b>	0.1 Hz
<b>Accuracy:</b>	±0.01%
<b>Output Range:</b>	0 to 2.5 V (rms, into 150Ω)
<b>Distortion:</b>	<2% (10 Hz to 100 Hz) <0.7% (100 Hz to 30 kHz)
<b>Waveshape:</b>	Sine, Square, Ramp, Triangle

### RECEIVER

<b>Frequency Range:</b>	100 kHz to 999.9999 MHz																					
<b>Resolution:</b>	100 Hz																					
<b>Sensitivity:</b>	2 μV typical (1 MHz to 1000 MHz, FM narrow)																					
<b>Antenna Input Protection:</b>	0.25 W																					
<b>Selectivity:</b>	<table> <thead> <tr> <th>Mode</th> <th>RX BW</th> <th>AF BW</th> </tr> </thead> <tbody> <tr> <td>FM WIDE</td> <td>200 kHz</td> <td>80 kHz</td> </tr> <tr> <td>FM MID</td> <td>200 kHz</td> <td>8 kHz</td> </tr> <tr> <td>FM NAR</td> <td>15 kHz</td> <td>8 kHz</td> </tr> <tr> <td>SSB</td> <td>6 kHz</td> <td>8 kHz</td> </tr> <tr> <td>AM NAR</td> <td>6 kHz</td> <td>8 kHz</td> </tr> <tr> <td>AM NORM</td> <td>15 kHz</td> <td>8 kHz</td> </tr> </tbody> </table>	Mode	RX BW	AF BW	FM WIDE	200 kHz	80 kHz	FM MID	200 kHz	8 kHz	FM NAR	15 kHz	8 kHz	SSB	6 kHz	8 kHz	AM NAR	6 kHz	8 kHz	AM NORM	15 kHz	8 kHz
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<b>Demodulation Output AM:</b>	5 mVrms/%																					
<b>FM:</b>	60 mVrms/1 kHz																					
<b>Impedance:</b>	600Ω																					

### RF FREQUENCY ERROR METER

<b>Meter Range:</b>	±30 Hz to ±10 kHz (full scale, 1-3-10 sequence)
<b>Meter Accuracy:</b>	±Master Oscillator, ±3% of full scale

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**AF FREQUENCY ERROR METER**

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**Frequency Range:** 10 Hz to 12 kHz  
**Meter Range:**  $\pm 3$  Hz to  $\pm 300$  Hz (full scale, decade sequence)  
**Meter Accuracy:**  $\pm 0.01\%$ ,  $\pm 3\%$  of full scale

**FM DEVIATION METER**

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**Meter Range:** 2 kHz to 60 kHz (full scale, 2-6-20 sequence)  
**Meter Accuracy:**  $\pm 5\%$  of reading,  $\pm 3\%$  of full scale (1 kHz tone)

**AM MODULATION METER**

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**Meter Range:** 60% and 200% full scale  
**Meter Accuracy:**  $\pm 5\%$  of reading,  $\pm 3\%$  of full scale (1 kHz tone)

**RF POWER METER**

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**Input Level Ranges:** 0 to 15 W and 0 to 150 W (peak or average)  
**Accuracy:**  $\pm 7\%$  of reading,  $\pm 3\%$  of full scale (1 to 600 MHz)  
 $\pm 20\%$  of reading,  $\pm 3\%$  of full scale (600 to 1000 MHz)  
**Operating Conditions:** 50 W continuous  
>50 W to 150 W (1 min ON, 5 min OFF)

**DISTORTION METER**

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**Range:** 0 to 20%  
**Accuracy:**  $\pm 1\%$  (at 10% distortion)  
**Signal Frequency:** 1 kHz

**SINAD METER**

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**Range:** 3 to 20 dB  
**Accuracy:**  $\pm 1$  dB (at 12 dB SINAD)  
**Signal Frequency:** 1 kHz

**OSCILLOSCOPE**

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**Bandwidth (3 dB):** 1 MHz  
**Input Ranges:** 10 mV/div to 10 V/div (decade sequence)  
**Horizontal Sweep Rate:** 1  $\mu$ sec/div to 10 msec/div (decade sequence)

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**MASTER OSCILLATOR**

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**TCXO**  
**Temperature Stability:**  $\pm 0.2$  PPM  
**Aging:**  $\pm 0.5$  PPM/year

**POWER REQUIREMENTS**

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**Line Voltage:** 105 to 130 VAC/210 to 260 VAC  
**Frequency:** 50 to 400 Hz  
**Power Consumption:** 60 W typical  
**DC Input:** 12 to 30 VDC

**GENERAL CHARACTERISTICS**

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**Dimensions:** 33.2 cm (13.06") wide, 18.5 cm (7.3") high, 44.5 cm (17.5") deep  
**Weight:** 17.2 kg (38 lbs) without options

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**Metrology**

We offer our customers a complete calibration check service on their instruments. Standards used in our Metrology Lab are NIST traceable. IFR is a member of the National Conference of Standards Laboratories.

**Warranty**

IFR Service Monitors are covered by a limited two-year warranty against defective parts and workmanship.

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*IFR Systems Inc. reserves the right to make design changes without notice.*



**IFR SYSTEMS, INC.**

10200 West York Street / Wichita, Kansas 67215-8935 U.S.A.  
Phone 316/522-4981 / 1-800-835-2352 / FAX 316/522-1360

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