

# The 1200 Super S

## Communications Service Monitor with built-in Spectrum Analyzer



### Displays

The 1200 Super S 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 1200 Super S 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, DTMF, MTS, IMTS and pulsed audio.

### Receiver

The 1200 Super S 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. A new channel mode allows the user to input channel numbers for various systems including: cellular, trunking, cordless phones, cable television, broadcast television and citizens band radio. Another new feature of the 1200 Super S is the capability to store up to 99 RF frequencies in memory. Measurement resources available in the receiver include: RF frequency error, RF power, audio frequency error, CTCSS frequency, modulation, spectrum analyzer and oscilloscope.

### Duplex Generator

In duplex mode, the 1200 Super S has the capability of generating and receiving simultaneously with a frequency offset from 0 to  $\pm$ 49.9975 MHz in 2.5 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.

### Spectrum Analyzer

Incorporated in the 1200 Super S is a versatile 1 to 1000 MHz spectrum analyzer that has 10 calibrated scan widths from 1 MHz/division to 1 kHz/division. The resolution bandwidths range from 30 kHz to

300 Hz and are automatically selected when the analyzer scan width is set. An optional tracking generator is available that provides the capability of making swept measurements on devices such as filters and duplexors. A new cable fault location routine is also included with the tracking generator option.

### Oscilloscope

The 1200 Super S 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.

### Options

- $\pm$ 0.05 PPM OCXO Time Base
- 30 dB Generate Amplifier
- Microphone
- Telescoping Antenna
- Soft Padded Carrying Case
- European Signaling
- Tracking Generator
- IEEE 488 (in lieu of RS-232)
- CLEARCHANNEL LTR<sup>®</sup>
- AMPS Mobile Station Test
- ETACS Mobile Station Test

# 1200 Super S specifications

## RF SIGNAL GENERATOR

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

## DUPLEX GENERATOR

Frequency Range:	0 to ±49.9975 MHz from receive frequency
Resolution:	2.5 kHz
Accuracy:	See Master Oscillator
Output Level Duplex:	-40 dBm (Low), -15 dBm (High)
T/R:	-85 dBm
Input Protection:	0.25 W

## MODULATION

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

## AUDIO GENERATORS

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

## RECEIVER

Frequency Range:	100 kHz to 999.9999 MHz																					
Resolution:	100 Hz																					
Sensitivity:	2 μV typical (1 MHz to 1000 MHz, FM narrow)																					
Antenna Input Protection:	0.25 W																					
Selectivity:	<table border="1"> <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
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																				
Adjacent Channel Rejection:	<table border="1"> <thead> <tr> <th>RX BW</th> <th>&gt;40 dB Down</th> </tr> </thead> <tbody> <tr> <td>200 kHz</td> <td>±300 kHz</td> </tr> <tr> <td>15 kHz</td> <td>±27 kHz</td> </tr> <tr> <td>6 kHz</td> <td>±12 kHz</td> </tr> </tbody> </table>	RX BW	>40 dB Down	200 kHz	±300 kHz	15 kHz	±27 kHz	6 kHz	±12 kHz													
RX BW	>40 dB Down																					
200 kHz	±300 kHz																					
15 kHz	±27 kHz																					
6 kHz	±12 kHz																					

Demodulation Output AM:	5 mVrms/%
FM:	60 mVrms/1 kHz
Impedance:	600Ω

## RF FREQUENCY ERROR METER

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

#### AF FREQUENCY ERROR METER

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

#### FM DEVIATION METER

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

#### AM MODULATION METER

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

#### RF POWER METER

Input Level Ranges:	0 to 15 W and 0 to 150 W (peak or average)
Accuracy:	±7% of reading, ±3% of full scale (1 to 600 MHz) ±20% of reading, ±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

Range:	0 to 20%
Accuracy:	±1% (at 10% distortion)
Signal Frequency:	1 kHz

#### SINAD METER

Range:	3 to 20 dB
Accuracy:	±1 dB (at 12 dB SINAD)
Signal Frequency:	1 kHz

#### SPECTRUM ANALYZER

Level Display:	10 dB/div
Dynamic Range:	70 dB
Log Linearity:	±2 dB (-90 to -30 dBm)

Frequency Span Modes:	Scan Width	RBW
	1 MHz/div	30 kHz
	500 kHz/div	30 kHz
	200 kHz/div	30 kHz
	100 kHz/div	30 kHz
	50 kHz/div	30 kHz
	20 kHz/div	3 kHz
	10 kHz/div	3 kHz
	5 kHz/div	3 kHz
	2 kHz/div	300 Hz
	1 kHz/div	300 Hz

#### OSCILLOSCOPE

Bandwidth (3 dB):	1 MHz
Input Ranges:	10 mV/div to 10 V/div (decade sequence)
Horizontal Sweep Rate:	10 μsec/div to 10 msec/div (decade sequence)

#### DIGITAL VOLTMETER

AC Volts Voltage Range:	0 to 100 Vrms
Accuracy:	±10% ±2 counts
Frequency Range:	45 Hz to 10 kHz
DC Volts Voltage Range:	0 to 100 V
Accuracy:	±10% ±2 counts

#### MASTER OSCILLATOR

TCXO Temperature Stability:	±0.2 PPM
Aging:	±0.5 PPM/year

#### POWER REQUIREMENTS

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

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

#### 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.

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

MADE WITH PRIDE IN  
**USA**